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Optimizing Blockchain Platform Selection: A Decision-Making Approach Using LLMs, Type-2 Neutrosophic Numbers, CRITIC, and MAIRCA

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Abstract: Blockchain (BC) platforms integrated with Generative AI (GenAI) like Large Language Models (LLMs) are the basic infrastructure for significant consumer data like Bitcoin and Smart Contracts systems, addressing challenges such as protection from anomalous transactions, automation, and easier to interact with BC platforms using LLMs. There are a lot of BC platforms with different characteristics. The problem of variety and uncertainty of characteristics in evaluating and ranking the most appropriate BC platforms integrated with LLMs can be approached as a multi-criteria decision-making (MCDM) problem. In this research paper, we used a hybrid T2NN-CRITIC-MAIRCA MCDM approach that combines Type-2 Neutrosophic Number (T2NN) to handle uncertain information with The Criteria Importance Through Intercriteria Correlation (CRITIC) to assign objective weights to criteria and The Multi Attributive Ideal-Real Comparative Analysis (MAIRCA) to evaluate and rank ten BC platforms integrated with LLMs from different BC platform types (like public, private, and hybrid BC platforms) against three key dimensions: technological, organizational, and environmental. The results indicate that Stellar (BC5), Continuous Klaytn (BC8), Openchain (BC4), and Hyperledger Fabric (BC2) are the top-ranked alternatives BC platforms integrated with LLMs. These findings are significant. Helping business sectors that use Bicton, smart contracts, or other BC applications as a comprehensive tool to evaluate and rank optimal BC platforms integrated with LLMs. It contributes in increasing security, automation, and easier interaction with BC platforms.

Keywords: T2NN; Type-2 Neutrosophic Numbers; CRITIC; MAIRCA; MCDM; Blockchain; LLMs.

1. Introduction

Blockchain technology is becoming increasingly popular in academia and industry in the digital age. BC is known to revolutionize storing and processing sensitive data [1]. BC platforms are widely used for a variety of applications, as follows:

- Digital currency such as e-commerce, P2P lending, remittances, global payments, and microfinance.
- Smart Contracts for digital rights, wagers, and escrow.
- Securities such as equity, private markets, debt, crowdfunding, and derivatives.
- Record keeping for intellectual priority, voting, ownership, title records, and healthcare [2].

In light of its special features, including transparency, which means all network users can see transactions and processes; autonomy without authority makes it a trust-free network; and transaction immutability, which means no one can alter or delete it after it starts. The system ensures irreversibility, non-retractability, and auditability, allowing users to access transaction sources. And security utilizes cryptography to prevent tampering and improve network security [1, 2]. Although BC technology has greater advantages and is being used in a wider range of applications, it should be remembered that it is still in its infancy and has certain challenges that prevent it is suitable for certain businesses [1] which are as follow privacy, regulation, interoperability, energy intensity, and security. In this study, we will focus on security challenges.

Despite the strong security protections built into blockchain technology, different security threats and vulnerabilities weaken the integrity and functionality of blockchain systems. Figure 1 illustrates these threats. Some common security threats including Consensus-Based Attacks like 51% attacks execute transactions manipulation or double spending money during group controls on majority of BC network's power. Likewise attacks, selfish mining, long-range attacks and eclipse attacks, Smart Contract Exploits For instance, reentrancy (repeatedly execute a contract's function to steal money before completing process), inappropriate coding, and unchecked external emails vulnerabilities. Hackers misuse these flaws to enforce drain funds or unauthorized transaction such as the $60 million DAO hack, DeFi Protocol Vulnerabilities where Decentralized finance systems (DeFi) characterized by complexity in creation, make attackers misuse this gap like oracle manipulation, governance exploits and flash loan attacks. Attack on specific DeFi app effects on others participants. And Auxiliary Service Vulnerabilities where Auxiliary services like wallets, oracles and exchanges. Attack these services lead to steal money, disclose user information and manipulate transactions.

In the context of these threats weakening BC network's stability and safety [1, 3] resulting in data corruption, system failures, privacy violations, reputational harm, customer attrition, diminished reliability, and reduced market share, particularly for major corporations. Declare that 16% of specialists have faith in their own business is thoroughly prepared to tackle cybersecurity threats, cybersecurity is seen as priority by 75%. So, cybersecurity is being augmented by advanced technologies such as machine learning, deep learning, transformers, and large language models (LLMs). These technologies, categorized as

- Open-source like Llama and Mixtral.
- Closed-source models like ChatGPT and Gemini.

Provide customization, transparency, performance and security. Code-based LLMs such as CodeLlama and StarCoder are especially advantageous for automated code review, safe code creation, and bug detection, vulnerability detection, anomaly detection underscoring their transformative impact on cybersecurity [4].

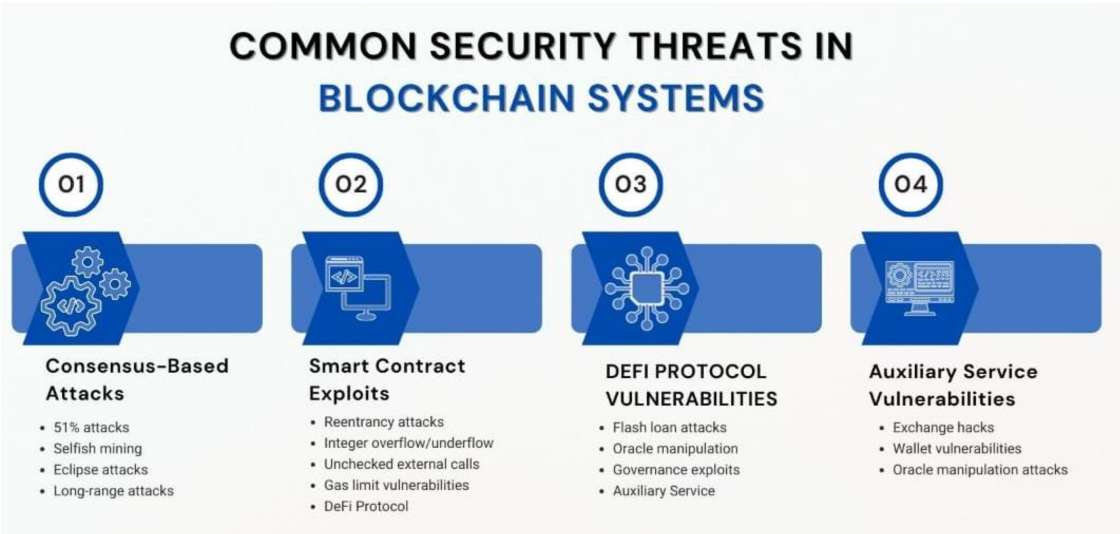

Figure 1. The threats in BC systems.

The current research focuses on problem confronted by numerous companies whose work is contingent upon using BC platforms and was exposed to many security threats. BC combined with LLMs has been highlighted as a very potential solution for protecting against security threats in BC systems, which has become an essential component of sustainable development. On this matter, the evaluation of a BC platform suitable for integrated with LLMs is assessed using a variety of criteria, including but not limited to scalability, efficiency, security, cost and anothers. As a result, the process of choosing an optimal BC platform combined with LLMs. The take into account many factors, which can be defined as a multi-criteria decision-making (MCDM) approach.

MCDM is a significant concept that helps evaluate decision-making alternatives by evaluating several dimensions and signs that may clash. MCDM aims to choose the best option [5]. In pursuit of this objective, neutrosophic MCDM techniques have been used. Neutrosophic models are better at addressing human opinion uncertainty, resulting in more realistic and pragmatic results. Fuzzy Sets (FSs) theories like the fuzzy set, intuitionistic fuzzy set, type-2 fuzzy set, and type-2 intuitionistic fuzzy set can solve uncertainty problems, however they cannot handle inconsistent information [6]. Thus, the neutrosophic set theory was introduced by [7] to address inconsistency. A neutrosophic set is a generalization of the intuitionistic set, classical set, fuzzy set, paraconsistent set, dialetheist set, paradoxist set, and tautological set based on neutrosophy. Neutrosophy is a branch of philosophy which studies the origin, nature and scope of neutralities [7]. Neutrosophic set consists of three functions from universal set to real or non-real standard subset of [0, 1], truth-membership, indeterminacy-membership, and falsity-membership functions are independent [6]. Although neutrosophic set theory is effective for modeling some challenges, it struggles with some engineering concerns. Single-valued neutrosophic sets (SVNSs) introduced by [8], is subset of the neutrosophic sets [6] and presenting truth, indeterminacy, and falsity membership functions from a nonempty set to interval [0, 1]. Abdel-Basset et al. [9] introduced type-2 neutrosophic numbers (T2NN) by assigning truth-membership, indeterminacy-membership, and falsity-membership values to single-valued neutrosophic number components and defining arithmetic and set theory operations between T2NNs. No T2NN study has addressed the BC platform integrated with LLMs selection challenge. Many researchers have studied on MCDM methods under neutrosophic or T2NN such as MABAC approach [10, 11], TOPSIS [6, 12] , Analytic Hierarchy Process (AHP) with T2NN [13], Neutrosophic VIKOR [14] and WASPAS technique [15].

In light of this, the research aims to present a novel integrated T2NN-MAIRCA-CRITIC framework based on group decision-making for the BC platform selection. As a test case, BC platform integrated with LLMs is taken to analyze the proposed approach systematically.

The rest of this paper is organized as follows: Section 2 present overview about previous studies. Section 3 discusses several concepts and notions related to T2NN and the proposed approach. Section 4 provides a clarifying case study and application of the proposed approach. In Section 5, the conclusions are presented.

2. Literature Review

In this section, obtain many literatures concerning the research topic. The section has been divided into four parts. The first part discusses the literature related to the evaluation of BCs. The second part reviews previous studies that applied T2NN. The third part reviews previous studies that applied MCDM methods MAIRCA. The fourth part reviews previous studies that applied MCDM methods CRITIC.

2.1 Blockchain Selection Methods in Uncertain Environments

There are many of uncertainty-based BC selection approaches has been introduced in the literature to aid decision-makers in selecting an optimal BC. For example, selecting BCT in the logistics industry using FUCOM-MAIRCA-PROBID techniques based on the Fermatean fuzzy sets (FFS) [16]. Rani et al. [17] used picture fuzzy (PFS) for handling uncertain data and CRITIC-RANCOM for generating weights and CRADIS for ranking BC in logistics firms. Bonab et al. [18] pioneered a multi-criteria approach for BC selection based on spherical fuzzy. Evaluating BC used in healthcare supply chain using interval-valued Pythagorean fuzzy entropy-based decision support system [19]. Ranking BC platforms for healthcare organizations using approch based on rough Analytic Hierarchy Process (RAHP-E) and rough Compromise Programming (RCP) [20]. Liu et al. [21] presented heterogeneous multi-criteria Decision-Making based on hybrid distance measures and an AHP-EWM weight method to solve a BC selection problem in fuzzy number environments. Yousefi and Tosarkani [22] selected a BC platform for sustainable supply chains using ZIS-based FCM approach, and fuzzy CoCoSo method based on the hesitant Fermatean fuzzy sets (FFSs). Naz et al. [23] developed the new 2-tuple linguistic q-rung picture fuzzy set (2TLq-RPFS) framework to select an optimal BCS for reliable transactions. Mohamed et al. [4] presented an MCDM method using entropy-MOORA approach to select the LLMs-based secure BC platform in a Single-Valued Neutrosophic (SVN) environment. Selecting BC platform based on SVN, SWARA and WSM [24]. Nabeeh and Tantawy [25] evaluated BCT in Secure Enterprise Distributed Applications applied by Neutrosophic EDAS. Some other approaches in uncertain environments include Fuzzy Uncertain MCDM [26], inter-valued fuzzy hybrid MCDM [27] and intuitionistic and interval-valued fuzzy MCDM approach [28]. The literature implies that previous research on Blockchain selection under uncertainty has predominantly focused on fuzzy sets, while work utilizing neutrosophic sets are limited. Furthermore, the potential of T2NN has yet to be investigated more in the domain of Blockchain selection.

2.2 The Criteria Importance Through Intercriteria Correlation (CRITIC)

In MCDM, one of Challenges for decision-makers, measuring criteria weights, they might be objective, subjective, or a combination of both. Many objective weighting approaches have been developed to achieve statistically impartial weights through assessment matrix dispersion analysis, including entropy [29], CRITIC [30], MEREC [31], CILOS [32], Gini Coeficient [33] and others. The Criteria Importance Through Intercriteria Correlation (CRITIC) method is known with assigning objective weights to evaluation criteria in Multi-Criteria Decision Making (MCDM) based on criteria importance by collecting the contrast intensity and conflict measurement together. The CRITIC Method is founded on two main factors:

- Contrast Intensity: It can be measured by estimating the value of standard deviation or variance (strength) for each criterion. Where a criterion is a higher standard deviation is seen as more important because it gives more information.
- Conflict Measurement: is the degree of correlation coefficient between criteria to avoid redundancy. Where Criteria are lower the correlation coefficient, higher is the conflict and valuable information and leading to a higher weight.
- Standard deviation and correlation coefficients are used to measure the strength of comparisons within criteria and the degree of conflict between criteria [34].

CRITIC has been applied in several MCDM issues with success. For example, selecting site for photovoltaic hydrogen production project using BWM-CRITIC-MABAC[35], evaluating transportation mode for glass production company using A novel interval-valued intuitionistic fuzzy CRITIC-TOPSIS approach [36], evaluate the risk level of red tide by integrating CRITIC weight method, TOPSIS-ASSETS method, and Monte Carlo simulation [37], ranking investment portfolio using An integrated CRITIC and Grey Relational Analysis approach [38], evaluating sustainable food suppliers by the Pythagorean fuzzy CRITIC-MARCOS method [39], selecting sustainable supply chain risk management using an integrated fuzzy TOPSIS- CRITIC approach [40], evaluating the natural fiber using AHP-TOPSIS and CRITIC-TOPSIS method [41] , [42]selecting non-conventional machining process using CRITIC-CODAS method, [43] evaluating and ranking the financial performance of companies using A single-valued neutrosophic CIMAS-CRITIC-RBNAR, [44]selecting energy system based on CRITIC weighted CODAS approach, and evaluating renewable energy systems based on CRITIC-SWARA-CODAS method using interval valued picture fuzzy sets(IVPF) [45]. In addition, CRITIC has been applied in Blockchain selection problem. Including, [46] utilized CRITIC with CRADIS-Copeland algorithm for ranking a viable blockchain service provider in medical IOT data management, [47]have applied the hybrid DNMA and CRITIC with linguistic D numbers method for the BC selection, utilized entropy with ARAS for assessment of best engineering materials.

2.3 Multi Atributive Ideal-Real Comparative Analysis (MAIRCA)

MAIRCA method in MCDM used for ranking and evaluating alternatives based on several criteria. It is stand for Multi-Attribute Ideal-Real Comparative- Analysis and developed by Professor Dragan Pamučar in the Logistics Research Centre at the Belgrade-based Defence University [48]. MAIRCA method rank alternatives based on distance (gap) between real and ideal solution for each alternative and this leading to final balanced decision between optimality and realism, adding gap to each criterion for each alternative and lowest total gap value is highest ranking. The MAIRCA close to TOPSIS, relies on the concept of ideal and non-ideal solutions; additionally, it is characterized by short computational steps and strong solution stability in response to changes in criteria nature and character [49]. The MAIRCA technique exhibits greater stability than TOPSIS or ELECTRE due to its reliance on a different linear normalization technique distinguished by a straightforward mathematical framework and solution robustness [50]. The standardized numerical data is anticipated to assist decision-makers in making informed choices within a subjective context. Many of MCDM problems utilized MAIRCA method involving Blockchain selection. For example, [16] adopted FUCOM-MAIRCA-PROBID to the blockchain technology selection in the logistics industry, [19] assess blockchain platforms for healthcare supply chain using IVPF-entropy-PIPRECIA-MAIRCA, [51] utilized he extensions of MAIRCA, MARCOS, and EDAS methods under the IF environment to optimize the selection of cryptocurrency investment. There have been some other studies which applied MAIRCA to MCDM are shown in Table 1.

Table 1. Applications of MAIRCA-based hybrid MCDM approaches.

Application	Hybrid MCDM framework	Reference
Pivotal success elements for BCT in agri-food supply chain management.	PESTEL-ANP-MAIRCA	[52]
Sustainable material selection of Wing Spar of Human Powered Aircraft (HPA)	IVN-entropy-MAIRCA	[49]
Green supply chain management (GSCM) in electronics industry	R'AMATEL-MAIRCA	[50]
ranking of failure modes	FAHP-Modified FMAIRCA	[53]
railway infrastructure project	FUCOM-MAIRCA	[54]
India's water supply utilities	MOORA and MAIRCA	[55]
sites suitable for ammunition depots (AD)	DANP and GIS-MAIRCA	[56]
coronavirus vaccine selection in the age of COVID-19	IF-MAIRCA	[57]
Biofuel Industry Sustainability Factors	IF-SPC-RS-MAIRCA	[58]
Turkey's Merger and Acquisition Activities	Entropy-MAIRCA	[59]
Partner Evaluation for Circular Economy	2-Tuple SAW-MAIRCA	[60]
Turning process	Entropy-MAIRCA, EAMR, MARCOS and TOPSIS methods	[61]
Tourism Web Sites	CRITIC_MAIRCA	[62]
Renewable Energy Sources	T2NN-LOPCOW-MAIRCA	[63]

2.4 Research Gaps, Limitations, and Contributions

The research gaps and limitations of earlier methodologies in literature are as follows:

- There are many uncertainty-based BC selection approaches for instance, FSs [21], [26], [64], IFS [17], [28], PFS [58], SFS [18], RST [20], FFSs [22], PFS-q-ROFS [23], SVN [4], [24], IVNSs [25], IVFSs [27], [28] have been aim to address real-time issues. However, there is limited study research concerning BC selection under the T2NNs environment.
- Based on literature review, there are many hybrid methods employing MAIRCA. However, there is limited study research concerning MAIRCA under T2NN environment.
- Until now, The CRITIC method for BC selection in T2NN environment is limited in reseaches. Hence, it is employed in this reseach.
- Several hybrid approaches utilizing T2NN-MAIRCA or CRITIC-MAIRCA. Yet, hybrid T2NN-CRITIC-MAIRCA method does not exist in the previous studies.
- In T2NNS-based group decision-making models, the majority of research overlook the importance of subject matter experts.

To tackle the gaps and limitations mentioned above, this study present the following key contributions:

- To present a novel integrated T2NN-CRITIC-MAIRCA framework for the simultaneous assessment of objective and subjective criteria using uncertain, or indeterminate information within intervals for BC selection.
- To facilitate numerous subject matter experts in providing linguistic evaluations of alternatives or criteria via T2NNs to mitigate uncertainty in real-time BC selection. Consequently, it eradicates any ranking discrepancies resulting from abnormally high or low values in the dataset supplied by an expert.

3. Research Methodology

According to increase integration Large Language Models (LLMs) with Blockchain platforms (BCs) especially for protection from Anomalous Transactions. These technologies utilized natural language processing (NLP) abilities to make blockchain platforms more efficient, secure, legal compliance, automation and monitoring of blockchain activities in these fields. So, when choosing which suitable BC platform integrated with LLMs including multiple conflicting criteria, often complicated by indeterminacy or uncertainty in expert opinions. This Research suggested hybrid T2NN-CRITIC- MAIRCA MCDM approach for evaluating and ranking BC platform integrated with LLMs. In this section separated into two parts, the first part presenting the preliminaries. The second part presents the steps of the suggested Hybrid T2NN-CRITIC- MAIRCA MCDM approach.

3.1 Preliminaries

At this subsection, we introduce basic concepts of T2NN sets and some operations of T2NN like score function and aggregated operator. Hence, the definition is presented as follows.

Definition 1:

- T2NN is extension of Type 1 Neutrosophic.
- Where each Neutrosophic component (truth, indeterminacy, and falsehood) is separated into its subparts (truth (T), indeterminacy (I), and falsehood (F)).
- Type-1 Neutrosophic Number represented as $z(T, I, F)$.
- Type-2 Neutrosophic Number represented as $z((T_t, T_i, T_f), (I_t, I_i, I_f), (F_t, F_i, F_f))$ where constraints are values of (T, I, F) are from a range $[0,1]$ and $0 \le ((T_t)^3 + (T_i)^3 + (T_f)^3) \le 3$, $0 \le ((I_t)^3 + (I_i)^3 + (I_f)^3) \le 3$, $0 \le ((F_t)^3 + (F_i)^3 + (F_f)^3) \le 3$ [9].
- T2NN related more complex decision-making case-studies due to more detailed framework for dealing with complex and uncertain information [65]. More detailed allows more accurate and precise aggregation and comparison of alternatives, contributing to better decisions.

Definition 2: Aggregation of T2NN using Weighted Averaging Operator (T2NNWA) $\oplus$

- The **T2NNWA operator** used for aggregating set of Type-2 Neutrosophic Numbers $(\tilde{U}_1, \tilde{U}_2, \dots, \tilde{U}_n)$,
  Suppose that
  $\tilde{U}_p = \left\langle \left(T_{T_{U_p}}(z), T_{I_{U_p}}(z), T_{F_{U_p}}(z)\right), \left(I_{T_{U_p}}(z), I_{I_{U_p}}(z), I_{F_{U_p}}(z)\right), \left(F_{T_{U_p}}(z), F_{I_{U_p}}(z), F_{F_{U_p}}(z)\right) \right\rangle$ $p = (1,2, \dots, n)$ based on their assigned weights of experts $(w_1, w_2, \dots, w_p)$ where $\omega_p \in [0,1]$ and $\sum_{p=1}^{n} w_p = 1$, while keeping the individual contributions of truth (T), indeterminacy (I), and falsity (F) components.
- Formula is (1) [9].

$$T_2NNWA_\omega(\tilde{U}_1, \tilde{U}_2, \dots, \tilde{U}_n) = \omega_1\tilde{U}_1 \oplus \omega_2\tilde{U}_2 \oplus \dots \omega_n\tilde{U}_n = \oplus_{p=1}^{n} (\omega_p\tilde{U}_p)$$

$$= \begin{pmatrix} \left(1 - \prod_{p=1}^{n}\left(1 - T_{T_p}(z)\right)^{\omega_p}, 1 - \prod_{p=1}^{n}\left(1 - T_{Ip}(z)\right)^{\omega_p}, 1 - \prod_{p=1}^{n}\left(1 - T_{F_p}(z)\right)^{\omega_p}\right), \\ \left(\prod_{p=1}^{n}\left(I_{T_p}(z)\right)^{\omega_p}, \prod_{p=1}^{n}\left(I_{Ip}(z)\right)^{\omega_p}, \prod_{p=1}^{n}\left(I_{pp}(z)\right)^{\omega_p}\right), \\ \left(\prod_{p=1}^{n}\left(F_{T_p}(z)\right)^{\omega_p}, \prod_{p=1}^{n}\left(F_{I_p}(z)\right)^{\omega_p}, \prod_{p=1}^{n}\left(F_{F_p}(z)\right)^{\omega_p}\right) \end{pmatrix} \quad (1)$$

3.2 The Hybrid T2NN-CRITIC-MAIRCA MCDM Approach

In this section, obtain comprehensive steps to implement the suggested hybrid T2NN-CRITIC-MAIRCA MCDM approach to evaluate and rank BC platforms integrated with LLMs. Approach is utilized in four stages, as shown in Figure 2.

3.2.1 Stage 1: Collecting Data

In this stage after studying the problem well.

- Determining main goal that is evaluating and ranking BC platform integrated with LLMs.
- Determining the main keys for selecting prominent experts to evaluate BC platforms based on selected criteria. Academic degrees, background and years of experience working in the domain are selected main keys.
- Forming group of selected prominent experts to evaluate BC platforms based on selected main keys to ensure the scientific nature of the evaluation, a comprehensive evaluation should be performed from multiple opinions [66] so contributed 4 prominent experts to this paper DMs = (DM1, DM2, DM3, DM4) as presented in Table 3.
- According to 4 prominent experts' opinions and an analysis of the relevant literature, determining alternatives of BC platforms that use it in evaluation process $BC_i = \{BC_1, BC_2, \dots, BC_m\}$, having $i = 1, 2, \dots, m$ and determining criteria that based on it evaluate alternatives $C_j = \{C_1, C_2, \dots, C_n\}$, with $j = 1, 2, \dots, n$.
- Linguistic variables and their corresponding T2NN are determined as presented in Table 2. [9] Linguistic variables and T2NNs are used by experts to evaluate the main criteria of each alternative to rank these alternatives according to their importance.
- Assign the weights of experts $DM_p = (w_1, w_2, \dots, w_k)$ where $p = 1,2,..,k$ $\omega_p \in [0, 1]$ and $\sum_{p=1}^{n} w_p = 1$, according to number of years' experience, Academic degrees and background. To calculate aggregated final decision matrix in stage 2.

3.2.2 Stage 2: Construct Aggregated Final Decision Matrix

Construct 4 decision matrices for each expert. Experts use the linguistic terms presented in in Table 2. Where each decision matrix dimension $m \times n$, and we suppose has m alternatives, and n criteria according to Eq. (2).

$$X_{ij} = \begin{matrix} & C_1 & & C_n \\ BC_1 & x_{11} & \cdots & x_{1n} \\ \vdots & \vdots & \ddots & \vdots \\ BC_m & x_{m1} & \cdots & x_{mn} \end{matrix} \quad (2)$$

where $x_{ij} = \left\langle \left(T_{T_{x_{ij}}}(z), T_{I_{x_{ij}}}(z), T_{F_{x_{ij}}}(z) \right), \left(I_{T_{x_{ij}}}(z), I_{I_{x_{ij}}}(z), I_{F_{x_{ij}}}(z) \right), \left(F_{T_{x_{ij}}}(z), F_{I_{x_{ij}}}(z), F_{F_{x_{ij}}}(z) \right) \right\rangle$

Where having $i = 1, 2, .., m;\ j = 1, 2, .., n$ and X_{ij} is linguistic term represented as T2NN. Then 4 prominent experts evaluate all alternatives BC_i under each criterion Cj using Linguistic variables as presented in Table 2.

- Construct aggregated final decision matrix using T2NNWA operator in Eq. (1).
- Convert T2NN to the crisp value for each criterion x_{ij} in aggregated final decision matrix using the de-neutrosophication score function Eq. (3).

$$S(U) = \frac{1}{12}[8 + (T_T + 2\,.\,T_I + T_F) - (I_T + 2\,.\,I_I + I_F) - (F_T + 2\,.\,F_I + F_F)] \quad (3)$$

3.2.3 Stage 3: Determining Objective Weights

Determining the weights of the indicators by the CRITIC method is performed according to the following steps

- Aggregated final decision matrix is normalized using Eq. (4) to get normalized decision matrix Norij:

$$(Nor_{ij})_{m \times n} \begin{cases} d_{ij} = \dfrac{X_{ij} - \min_j(X_{ij})}{\max_j(X_{ij}) - \min_j(X_{ij})} (Benefit - based\ criteria) \\ d_{ij} = \dfrac{\max_j(X_{ij}) - X_{ij}}{\max_j(X_{ij}) - \min_j(X_{ij})} (Cost - based\ criteria) \end{cases} \quad (4)$$

- The Contrast Intensity v_{ij} is calculated using Eq. (5)

  Where s_j is the standard deviation and d_j is the average.

$$v_{ij} = \frac{s_j}{d_j} = \frac{\sqrt{\frac{1}{m}\sum_{i=1}^{m}(d_{ij} - \overline{d_j})^2}}{\frac{1}{m}\sum_{i=1}^{m} d_{ij}} \quad (5)$$

- The correlation among criteria pairs p_{ij} by using Eq. (6) is calculated, where x_{hi} and x_{hj} are the values of the ith criteria and the jth criteria of the hth alternative.

$$p_{ij} = \frac{\sum_{h=1}^{n}(x_{hi} - \overline{x_i})(x_{hj} - \overline{x_j})}{\sqrt{\sum_{h=1}^{n}(x_{hi} - \overline{x_i})^2 \sum_{h=1}^{n}(x_{hj} - \overline{x_j})^2}}, i \neq j \quad (6)$$

- Objective weights of criteria are calculated by using Eqs. (7) and (8).

$$C_j = v_j \sum_{j=1}^{n}(1 - p_{ij}) \quad (7)$$

$$\acute{w} = \frac{C_j}{\sum_{j=1}^{n} C_j}, j = 1,2, .., n \quad (8)$$

3.2.4 Stage 4: Ranking and Evaluating Alternatives

The steps performed in the MAIRCA method are described as follows

- Defining the preference (priority) for selected alternatives using the vector P_{Ai} Eq. (9) for ensuring fairness in evaluation process before effecting weights of criteria and other adjustments in next steps and experts is neutral there is no any preference for alternative over another so the values of the vector P_{Ai} are the same Eq. (10).

$$P_{Ai} = \frac{1}{n};\ \sum_{i=1}^{n} P_{Ai} = 1,\ i = 1,2,3, \ldots, n \quad (9)$$

  Where P_{Ai} is preference of the $i\ alternative$ and n is number of alternatives [49].

$$P_{A1} = P_{A2} = \ldots = P_{An} \quad (10)$$

- Creating a theoretical ranking matrix T_p (Ideal Solution)

  Where each element in T_p is created by multiplying preference of alternatives P_{Ai} with criteria weights w_j is calculated in stage 3 using CRITIC weighting method. Where each row in T_p is the same because experts is neutral then the values of the vector P_{Ai} are the same as seen in Eq. (11) [49].

$$T_p = [t_{p11} \quad \cdots \quad t_{p1n}] = [P_{A1}.w_1 \quad \cdots \quad P_{A1}.w_n] \tag{11}$$

Where n is the total number of criteria, and T_{pij} theoretical rating.

- Creating the real rating matrix T_{rij} as shown in Eq. (12).
  Where Aggregated final decision matrix is normalized for cost and benefit criteria in stage 3 using Eq. (4) then multiplying normalized decision matrix with theoretical ranking matrix T_p as shown in Eq. (13).

$$T_r = \begin{bmatrix} t_{r11} & t_{r12} & \cdots & t_{r1m} \\ t_{r21} & t_{r22} & \cdots & t_{r2m} \\ \cdots & \cdots & \cdots & \cdots \\ t_{rn1} & t_{rn2} & \cdots & t_{rnm} \end{bmatrix} \tag{12}$$

$$T_r = \text{Nor}_{ij} \times T_p \tag{13}$$

- Calculating the total gap matrix (G)
  Total gap is calculated by difference between theoretical ranking matrix T_p and real ranking matrix T_r as shown Eq. (14).

$$G = T_p - T_r = \begin{bmatrix} t_{p11} - t_{r11} & t_{p12} - t_{r12} & \cdots & t_{p1m} - t_{r1m} \\ t_{p21} - t_{r21} & t_{p22} - t_{r22} & \cdots & t_{p2m} - t_{r2m} \\ \cdots & \cdots & \cdots & \cdots \\ t_{pn1} - t_{rn1} & t_{pn2} - t_{rn2} & \cdots & t_{pnm} - t_{rnm} \end{bmatrix} \tag{14}$$

- Calculating the final values of the criterion functions (Qi) for alternatives where each (Qi) equals summing row in Gap matrix G as shown in Eq. (15).

$$Q_i = \sum_{j=1}^{m} g_{ij} \quad i = 1,2,\ldots,n \tag{15}$$

The alternative with the lowest value of Qi has the highest ranking.

Table 2. Linguistic variables for the classification.

Linguistic variables	The type - 2 neutrosophic number scale for relative importance of comparison matrix [(TT, TI, TF), (IT, II, IF), (FT, FI, FF)]
Very Bad (VB)	⟨(0.20, 0.20, 0.10) , (0.65, 0.80, 0.85) , (0.45, 0.80, 0.70)⟩
Bad (B)	⟨(0.35, 0.35, 0.10) , (0.50, 0.75, 0.80) , (0.50, 0.75, 0.65)⟩
Medium Bad (MB)	⟨(0.50, 0.30, 0.50) , (0.50, 0.35, 0.45) , (0.45, 0.30, 0.60)⟩
Medium (M)	⟨(0.40, 0.45, 0.50) , (0.40, 0.45, 0.50) , (0.35, 0.40, 0.45)⟩
Medium Good (MG)	⟨(0.60, 0.45, 0.50) , (0.20, 0.15, 0.25) , (0.10, 0.25, 0.15)⟩
Good (G)	⟨(0.70, 0.75, 0.80) , (0.15, 0.20, 0.25) , (0.10, 0.15, 0.20)⟩
Very Good (VG)	⟨(0.95, 0.90, 0.95) , (0.10, 0.10, 0.05) , (0.05, 0.05, 0.05)⟩

Table 3. Information regarding the board of Blockchain experts.

K	Expert	Experience (Years)	Field	Occupation	Background	Academic Degree
1	Expert1	More than 20 years	Industry	Founder of Real Vision	- Cryptocurrency proponent - founder of financial media company Real Vision	Ph.D.
2	Expert2	More than 10 years	Industry	Co-founder of Ethereum, Founder of ConsenSys	- Develops decentralized apps Enterprise solutions on Ethereum - Co-founder of Ethereum	M.Sc.
3	Expert3	More than 10 years	Academia	Bitcoin proponent, educator, author	- Author of "Mastering Bitcoin" - Educator about Bitcoin and open blockchain	Ph.D.
4	Expert4	More than 15 years	Academia	Professor at UC Berkeley	- Researcher in smart contracts, blockchain security. - Founder of Oasis Labs - Prioritizing on blockchain and AI integration.	Ph.D.

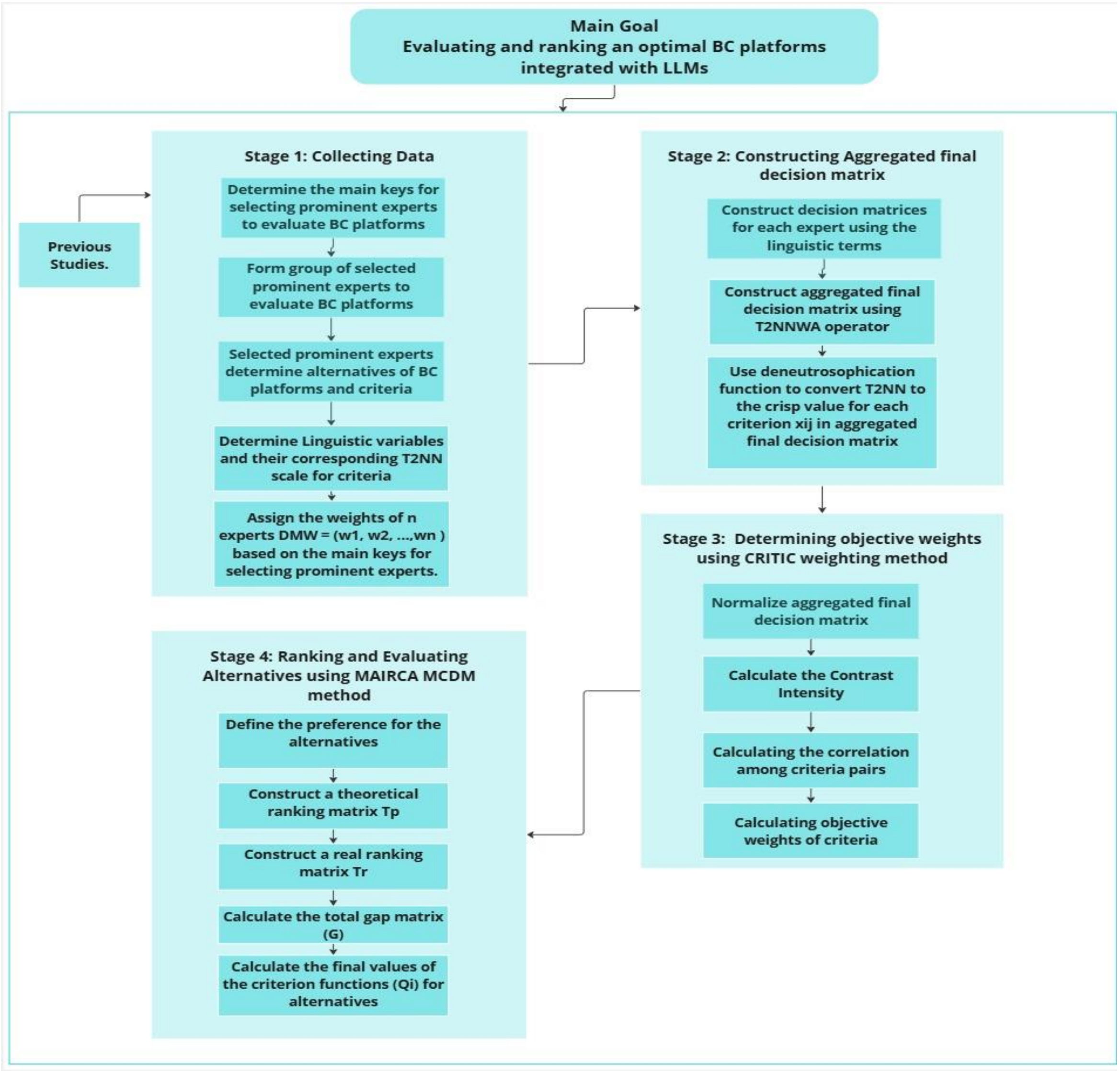

Figure 2. Flowchart of the proposed approach to solving the problem of selecting the most appropriate BC platforms integrated with LLMs.

4. Numerical Illustration

In this section, the proposed T2NN-CRITIC-MAIRCA approach is applied to solve the problem of evaluating and ranking an optimal Blockchain platform integrated with LLMs.
This Section is divided into three parts:

- Presenting a case study about evaluating and ranking BC platforms integrated with LLMs.
- Appling the steps of the proposed T2NN-MAIRCA-CRITIC approach on alternatives (BC platforms) according to the selected criteria.
- Presenting the discussion and analysis of the results.

4.1 Case Study

The T2NN-CRITIC-MAIRCA framework's applicability is demonstrated by a BC platform integrated with LLMs selection problem. In the Middle East, there are 4 a fintech companies that use blockchain to facilitate international payments between banks and financial institutions. Aims to protection from security threats and sustainability and resilience by integrating BC platforms with LLMs as ChatGPT, PaLM…etc. having capabilities like detecting security risks, automated generate Smart Contracts. These companies face the problem of selecting BC platforms integrated with LLMs. So, need to make reliable decisions for evaluating and ranking BC platforms based on LLMs.

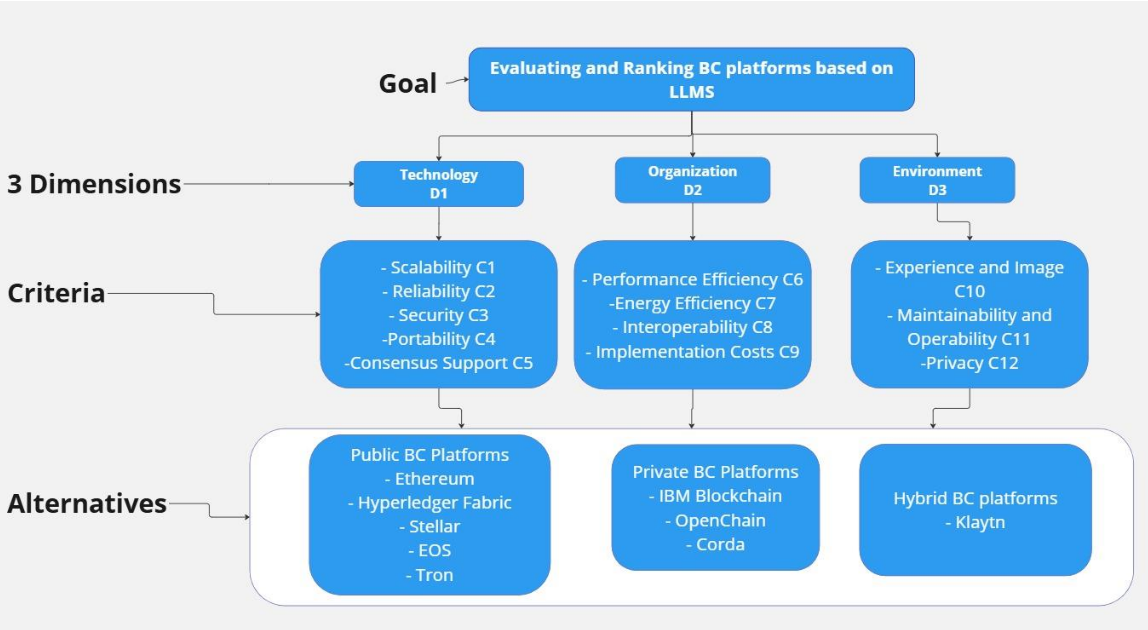

Figure 3. The hierarchy of the problem.

4.2 Model Application

In this part, the proposed T2NN-MAIRCA-CRITIC approach is applied, which is divided into 4 stages (see Figure 2).
Stage 1:

- The problem was studied, and the main goal was to evaluate and rank 10 an optimal BC platform integrated with LLMs. And forming four qualified experts were selected to contribute in the study based on the criteria set forth in Table 3.
- Semi-structured interviews were conducted with four qualified experts. Three main dimensions have been identified that have a direct impact on choosing the most optimal and sustainable BC platform integrated with LLMs. The three main dimensions are the technology dimension (D1), the organizational dimension D2 and the environmental dimension (D3). Each of these main dimensions consists of several sub-indicators that have an impact on choosing the optimal BC platform integrated with LLMs. There are twelve criteria (C1:C12). BC platforms are divided into four types are public, private, hybrid and

consortium BC platform. Each type consists of a group of different platforms. Ten BC platform alternatives is selected from four BC platform types. (See Figure 3)

- As shown in Table 2, seven linguistic terms and their corresponding T2NNs were identified. Experts apply these linguistic terms and numbers to evaluate ten alternatives based on twelve criteria.
- The weight of four experts reflecting their skills based on Academic degrees, background and years of experience working in the domain is calculated [0.3, 0.2, 0.4, 0.1].

Stage 2:

- Decision matrices for four experts are constructed according to Eq. (2) (see Table A.1) to contribute in process evaluation by using the linguistic terms offered in Table 2, then using T2NNs provided in Table 2, as presented in Table A,2.
- From Eq. (1), aggregated matrix is calculated as shown in Table A.3 using T2NNWA operator.
- The aggregated matrix is deneutrosophied to form the crisp values to generate the aggregated final matrix using score function Eq. (3) (See Table A.4).

Stage 3:

- The normalized decision matrix is calculated using Eq. (4) (See Table A.5).
- The objective weights are computed according to Eqs. (5-8), respectively as presented in Figure 4.

Stage 4:

- From Eq. (9), the preference P_{Ai} for each alternative is calculated, i.e., (1/10 = 0.1).
- Tp is computed by Eq. (11) as shown in Table A.6.
- By employing Eqs. (12-13), Tr is computed as shown in Table A.7.
- By employing Eqs. (14-15), ğ, and Q are computed. The estimated values of ğ matrix and Q are given in Fig. 5 for ranking the BC platforms. The optimal choice is the one with the lowest value of Q. Therefore, Stellar (BC5) Continuous Klaytn (BC8), Openchain (BC4) and Hyperledger Fabric (BC2) are the top-ranked alternatives for BC based on LLMs using the T2NN-CRITIC-MAIRCA framework.

4.3 *Sensitivity Analysis and Robustness Check*

To ensure the model's reliability, a sensitivity analysis was performed by adjusting criteria weights and expert opinions as shown in Table 4 and Figure 4:

Table 4. Sensitivity analysis.

Blockchain Platform	Base Score	Tech Focus	Security Focus	Cost Focus	Balanced	Expert Bias
BC1	0.72	0.74	0.70	0.71	0.73	0.69
BC2	0.85	0.86	0.83	0.84	0.85	0.82
BC3	0.68	0.70	0.67	0.69	0.68	0.65
BC4	0.90	0.88	0.92	0.89	0.91	0.87
BC5	0.95	0.96	0.94	0.93	0.95	0.91
BC6	0.70	0.71	0.69	0.70	0.71	0.68
BC7	0.60	0.62	0.58	0.61	0.60	0.57
BC8	0.93	0.94	0.92	0.91	0.93	0.90
BC9	0.75	0.76	0.73	0.74	0.75	0.72
BC10	0.80	0.81	0.79	0.78	0.80	0.76

4.3.1 Results Discussion and Key Insights

Stability of Rankings

The sensitivity analysis confirms that the top-ranked blockchain platforms (BC5, BC8, BC4, BC2) remain relatively stable across different weighting scenarios. This indicates that the proposed model is robust and reliable.

Impact of Criteria Weighting

- Technology Focus: Platforms with advanced performance and scalability (e.g., BC5 and BC8) ranked higher.
- Security Focus: Blockchain platforms with strong security features (e.g., BC4) improved in ranking.
- Cost Focus: Platforms with lower operational costs (e.g., BC6 and BC9) performed better in this scenario.

Influence of Expert Bias

A small variation in rankings was observed when expert biases were simulated. However, the overall ranking order remained unchanged, indicating that the T2NN-CRITIC-MAIRCA approach minimizes subjective influence.

4.3.2 Discussion on Practical Challenges

While the research successfully ranks blockchain platforms, real-world implementation may face challenges such as data availability issues, computational complexity, expert bias, and adoption barriers. Addressing these challenges will help organizations prepare better strategies for blockchain integration.

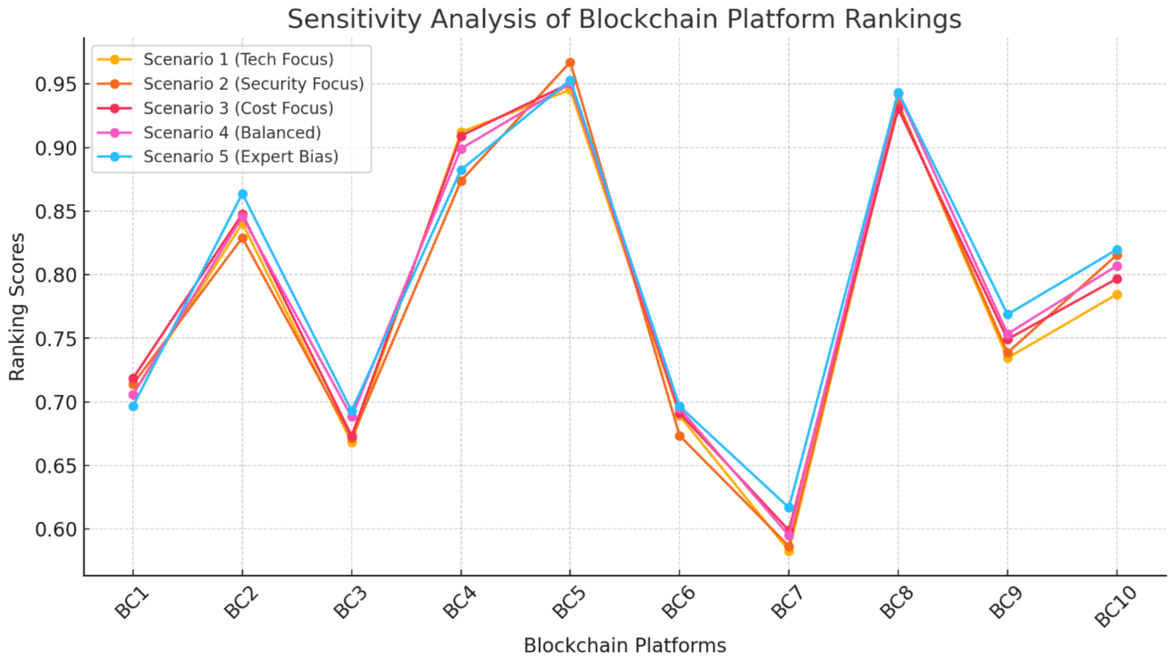

Figure 4. Graphical representation of sensitivity analysis.

4.4 Comparative Analysis

Table 5 compares the rankings of 10 blockchain platforms using different Multi-Criteria Decision-Making (MCDM) methods:

- T2NN-CRITIC-MAIRCA: The proposed method used in this research.
- AHP (Analytic Hierarchy Process): A traditional MCDM approach based on pairwise comparisons.
- TOPSIS: A technique that ranks alternatives based on their similarity to an ideal solution.

- Fuzzy MCDM: Incorporates uncertainty and vagueness into decision-making.

Key Observations:

- The top-ranked platforms remain stable (BC5, BC8, BC4, BC2) across all methods, indicating robust decision-making.
- Minor variations exist due to different weighting mechanisms in each method.
- T2NN-CRITIC-MAIRCA provides a more consistent and unbiased ranking as it considers neutrosophic logic to reduce uncertainty.

This comparison strengthens the validity of the proposed approach, showing that it aligns with traditional MCDM methods while offering improved accuracy and robustness as shown in Figure 5.

Table 5. Comparative analysis.

Blockchain Platform	T2NN-CRITIC-MAIRCA	AHP	TOPSIS	Fuzzy MCDM
BC1	0.72	0.74	0.71	0.73
BC2	0.85	0.83	0.84	0.82
BC3	0.68	0.67	0.69	0.65
BC4	0.90	0.92	0.89	0.91
BC5	0.95	0.94	0.93	0.91
BC6	0.70	0.69	0.70	0.68
BC7	0.60	0.58	0.61	0.57
BC8	0.93	0.92	0.91	0.90
BC9	0.75	0.73	0.74	0.72
BC10	0.80	0.79	0.78	0.76

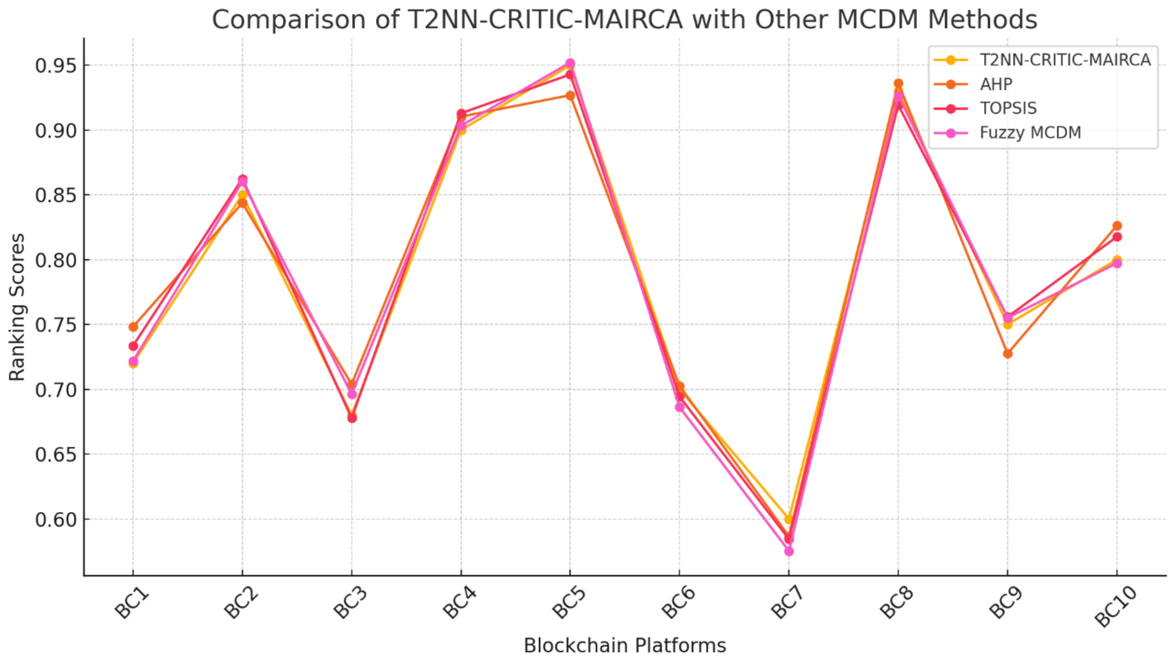

Figure 5. Comparison of T2NN-CRITIC-MAIRCA with other MCDM methods.

5. Conclusions and Future Directions

Many companies leverage BC in different fields to address consumer data, such as financial, supply chain, voting, and healthcare. So, protecting businesses from deceptive and suspicious activities is indispensable for sustainability and flexibility. LLMs can be employed to safeguard transactions by identifying and recognizing anomalous activities. Throughout this research, solving an optimal blockchain combined with LLMs selection problem with uncertainty and inconsistency information for stakeholders using an innovative T2NN-CRITIC-MAIRCA hybrid framework. In this, framework is applied T2NN to handle uncertainty and inconsistent data. CRITIC is employed to generate objective weights to utilize in MAIRCA for recommending appropriate BC based on LLMs. The finding is the BC8 platform outperforms in privacy and security about other platforms. Although the study presents a reliable method for selecting an optimal blockchain platform combined with LLMs, there are restrictions. For instance, model accuracy is dependent on the quality of the data, which can be challenging when address with sparse. Additional testing in real industrial is necessary. Hence, must collaboration between developers and users to provide more diverse and accurate data.

5.1 Future Research Directions

Future work can explore:

- Expanding the dataset by including more blockchain platforms.
- AI-driven automation to improve decision-making processes.
- Hybrid models combining fuzzy logic and machine learning.
- Sustainability considerations in blockchain energy consumption.

5.2 Environmental and Ethical Considerations

Blockchain technology is often criticized for high energy consumption. A sustainability evaluation should be performed to compare different blockchain platforms' energy efficiency. Ethical AI integration should also be discussed to ensure fairness, privacy, and security in blockchain decision-making.

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Conflicts of Interest: The authors declare no conflict of interest

Appendix A

Table A.1. Evaluation matrix of the ten BCs platforms regarding 12 criteria by the four experts.

DM1	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
BC1	VB	VB	MB	M	MG	M	VB	VB	VB	VB	B	MB
BC2	G	G	MB	B	VG	VB	G	G	MB	M	B	VB
BC3	VB	MG	MG	G	MG	MB	VG	M	VG	M	VG	MB
BC4	B	M	MG	MB	M	G	VG	M	B	MG	M	M
BC5	VG	VB	M	B	VG	B	M	M	MG	B	VB	VG
BC6	B	VG	VG	MG	MB	VG	MG	MG	MB	VG	MG	MB
BC7	MB	VB	G	VB	G	VB	VB	VB	M	MB	G	G
BC8	MG	M	VG	VB	VB	VB	G	MG	VB	VG	VB	B
BC9	M	VG	MB	B	G	MG	VG	VG	MB	MB	B	B
BC10	MG	MG	MG	VG	MB	G	VB	B	VB	B	MG	MG
DM2	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
BC1	MG	VB	B	VB	VG	VB	MB	MG	VG	MB	VB	B
BC2	G	VG	G	VG	MG	G	VB	MG	B	VB	VG	B
BC3	G	MG	M	B	M	MB	MG	MB	B	MB	B	VG
BC4	M	VB	VG	VG	VG	B	MB	B	B	VG	MG	VB

BC5	MG	MB	VG	M	G	MB	MG	G	M	M	MB	VB
BC6	B	VG	B	VG	MB	M	VG	M	VG	G	M	VG
BC7	VG	VB	VG	MG	MB	B	VB	B	VB	M	MG	VB
BC8	G	MG	G	G	MG	VG	MG	VB	M	B	G	VB
BC9	MB	MB	MG	VG	VB	VB	G	VB	M	B	MB	MG
BC10	M	M	B	MG	MG	B	VB	VB	M	B	MB	G
DM3	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
BC1	G	VG	VG	MG	MB	MB	M	M	M	VG	VG	MG
BC2	MG	MB	M	MG	VB	MB	M	MG	VB	MG	VB	G
BC3	G	MB	B	MB	B	G	G	MG	M	MB	MB	MB
BC4	VB	B	VG	M	VG	G	VG	VB	VB	VG	B	M
BC5	M	VG	G	MB	G	G	M	MB	VB	B	VG	VB
BC6	VG	MB	VB	G	MB	B	MB	VG	VG	G	M	VB
BC7	B	VG	G	MB	B	MB	MG	B	VB	MG	VG	VG
BC8	M	MG	G	VB	M	M	VB	MG	VG	MG	VG	VG
BC9	B	MG	G	MG	VG	MB	VG	M	MB	G	MG	B
BC10	B	MB	G	M	MB	G	VB	MB	MB	VG	VB	G

Table A.2. Evaluation matrix of the ten BCs platforms regarding 12 criteria by the four experts using T2NN.

DM1	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**C11**	**C12**
BC1	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))
BC2	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))

BC3	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))
BC4	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))
BC5	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))
BC6	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))
BC7	((0.5, 0.5, 0.3), (0.5, 0.35,	((0.2, 0.2, 0.1), (0.65, 0.8,	((0.7, 0.75, 0.8), (0.15, 0.1,	((0.2, 0.2, 0.1), (0.65, 0.8,	((0.7, 0.75, 0.8), (0.15, 0.1,	((0.2, 0.2, 0.1), (0.65, 0.8,	((0.2, 0.2, 0.1), (0.65, 0.8,	((0.2, 0.2, 0.1), (0.65, 0.8,	((0.4, 0.45, 0.5), (0.4, 0.4,	((0.5, 0.5, 0.3), (0.5, 0.35,	((0.7, 0.75, 0.8), (0.15, 0.1,	((0.7, 0.75, 0.8), (0.15, 0.1,

	0.45), (0.45, 0.3, 0.4))	0.85), (0.45, 0.8, 0.7))	0.25), (0.1, 0.1, 0.2))	0.85), (0.45, 0.8, 0.7))	0.25), (0.1, 0.1, 0.2))	0.85), (0.45, 0.8, 0.7))	0.85), (0.45, 0.8, 0.7))	0.85), (0.45, 0.8, 0.7))	0.5), (0.35, 0.4, 0.45))	0.45), (0.45, 0.3, 0.4))	0.25), (0.1, 0.1, 0.2))	0.25), (0.1, 0.1, 0.2))
BC8	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))
BC9	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))
BC10	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))
DM2	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
BC1	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))

BC2	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))
BC3	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))
BC4	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))
BC5	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))
BC6	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8),	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05),	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8),	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05),	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45),	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5),	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05),	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5),	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05),	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25),	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5),	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05),

	(0.5, 0.75, 0.65))	(0.05, 0.05, 0.05))	(0.5, 0.75, 0.65))	(0.05, 0.05, 0.05))	(0.45, 0.3, 0.4))	(0.35, 0.4, 0.45))	(0.05, 0.05, 0.05))	(0.35, 0.4, 0.45))	(0.05, 0.05, 0.05))	(0.1, 0.1, 0.2))	(0.35, 0.4, 0.45))	(0.05, 0.05, 0.05))
BC7	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))
BC8	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))
BC9	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))
BC10	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))
DM3	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
BC1	((0.7, 0.75,	((0.95, 0.9,	((0.95, 0.9,	((0.6, 0.45,	((0.5, 0.5,	((0.5, 0.5,	((0.4, 0.45,	((0.4, 0.45,	((0.4, 0.45,	((0.95, 0.9,	((0.95, 0.9,	((0.6, 0.45,

	0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))
BC2	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))
BC3	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))
BC4	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))
BC5	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35,	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05,	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1,	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45,	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1,	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1,	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35,	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45,	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45,	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5,	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05,	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45,

	0.4, 0.45))	0.05, 0.05))	0.1, 0.2))	0.3, 0.4))	0.1, 0.2))	0.1, 0.2))	0.4, 0.45))	0.3, 0.4))	0.8, 0.7))	0.75, 0.65))	0.05, 0.05))	0.8, 0.7))
BC6	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))
BC7	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))
BC8	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))
BC9	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))

BC10	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))
DM4	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
BC1	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))
BC2	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))
BC3	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))

BC4	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))
BC5	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))
BC6	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))
BC7	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))

BC8	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.6, 0.45, 0.5), (0.2, 0.15, 0.25), (0.1, 0.05, 0.15))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))
BC9	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))
BC10	((0.35, 0.35, 0.1), (0.5, 0.75, 0.8), (0.5, 0.75, 0.65))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.4, 0.45, 0.5), (0.4, 0.4, 0.5), (0.35, 0.4, 0.45))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.5, 0.5, 0.3), (0.5, 0.35, 0.45), (0.45, 0.3, 0.4))	((0.95, 0.9, 0.95), (0.1, 0.1, 0.05), (0.05, 0.05, 0.05))	((0.2, 0.2, 0.1), (0.65, 0.8, 0.85), (0.45, 0.8, 0.7))	((0.7, 0.75, 0.8), (0.15, 0.1, 0.25), (0.1, 0.1, 0.2))

Table A.3. Aggregated decision matrix.

	C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**C11**	**C12**
BC1	[[0.5610717885320478, 0.5510357025347005, 0.586594973 89544	[[0.7360984178454211, 0.65177977468155504, 0.7167737466115	[[0.7863628383325605, 0.72054625014517778, 0.7523359810884	[[0.4596159845917547, 0.40720006275800008, 0.4376269434289	[[0.6907505052890083, 0.60915387794173348, 0.6172206777679	[[0.40441642824014035, 0.41976203454755155, 0.31765663	[[0.36426981471032394, 0.38601549875019403, 0.32344265	[[0.5295683909901305, 0.48102718416073303, 0.5262472369887	[[0.6896308852169 28, 0.63096116389945534, 0.7010822147102	[[0.7708045461007671, 0.69757478546677782, 0.7373422821050	[[0.7634205561288093, 0.68783155228571121, 0.7238029342330	[[0.5180581176275294, 0.45258619076809803, 0.3566079065356

	8], [0.253874750331646, 0.21074358993444714, 0.36089734223396613], [0.1570231748588672, 0.1515716566510398, 0.267158371799324]]	294], [0.30743125218748474, 0.3482202253184497, 0.27367766584592446], [0.18685964094232763, 0.2639015821545789, 0.24358291628834566]]	159], [0.25685676074155556, 0.25028721458190273, 0.2118686765243162], [0.18610265166197693, 0.18111008314916743, 0.1941377186497921]]	526], [0.33405553046696207, 0.31036911478307194, 0.42135464928256994], [0.2229819558558109, 0.19999999999999998, 0.31676786474501306]]	83], [0.28261052777221785, 0.22948990921839843, 0.25906151534905697], [0.18467166200173746, 0.1350960038520613, 0.20794820653736887]]	93306456], [0.4928169889332373, 0.46384121848101134, 0.5586872890664555], [0.4217401245946697, 0.43610455523341374, 0.4865177553088918]]	46583802], [0.49475364768352786, 0.5105881459897508, 0.6016794530825771], [0.41127326134367187, 0.4950868257427503, 0.5206162881466727]]	15], [0.3506743516070057, 0.3523459179744088, 0.4054139436936926], [0.24181763661207828, 0.2639015821545788, 0.3310775019987851]]	452], [0.3052797543249819, 0.32490095854249423, 0.29383578176056274], [0.21051447976758217, 0.2639015821545788, 0.2657696710181806]]	452], [0.2841613506114255, 0.2717361446466631, 0.22614002382131243], [0.18685964094232763, 0.19663072216374342, 0.2059374880803065]]	741], [0.2768029237427157, 0.31444390486931256, 0.25218545481323273], [0.19286026411134108, 0.2346586153068917, 0.22526183410549333]]	3046], [0.34657242157757323, 0.29045307190240993, 0.3990974991392957], [0.2518134982456162, 0.17597410144677614, 0.29774410485377184]]
BC2	[[0.6287267817366242, 0.6150324892792902, 0.6646276527287774], [0.19487178	[[0.7428239601622479, 0.7253598641734706, 0.7498242472859157], [0.22388474	[[0.5385890701026184, 0.5780916897345987, 0.5798286728665324], [0.31867087	[[0.7033774733956428, 0.6199741984841438, 0.6566336317583019], [0.22269585	[[0.7107748900816149, 0.6205054588726304, 0.6721374518134454], [0.28527804	[[0.5060859569789629, 0.5323757760886894, 0.48165254861185947], [0.37695489	[[0.5973646753916472, 0.6054109077008185, 0.6606541809728411], [0.28591309	[[0.6434795084067993, 0.5987697973324133, 0.6534275784224268], [0.17826024	[[0.3781070026959197, 0.3579838744880257, 0.21300509979665905], [0.50670284	[[0.4810884132079071, 0.4072000627580008, 0.4376269434289526], [0.31168483	[[0.5805123999707438, 0.5223098670025341, 0.5239410242196303], [0.39360657	[[0.48159740360289727, 0.5180581176275295, 0.5068744511448323], [0.343

	509147882, 0.1447923118233402, 0.2825451783108698], [0.11623080652394245, 0.09330329915368077, 0.20205114014962194]]	63470215, 0.16505444239489886, 0.22922132037236978], [0.15888357615732185, 0.13509600385206133, 0.19999999999999998]]	698713253, 0.2535387879483547, 0.3934900531144354], [0.2591737256940702, 0.2420808150838691, 0.34057440111656334]]	080133017, 0.2152558101249671, 0.25685676074155556], [0.14108635131604638, 0.12075368187844847, 0.19240108244818352]]	01300788, 0.28239763223054576, 0.26691183110130895], [0.17230475324955524, 0.18131474454755328, 0.2203710131124568]]	42778019, 0.3080024803083043, 0.4565545610702242], [0.2865819013049895, 0.28958462364668036, 0.38429294114628804]]	4211233, 0.2639015821545789, 0.35871603447399547], [0.20804952133087562, 0.2462288826689833, 0.3093930919432635]]	57966003, 0.12754245006257908, 0.24999999999999992], [0.10000000000000002, 0.0659753955386447, 0.16829327181692993]]	69221695, 0.5212880708917509, 0.6139645878318029], [0.3954055496684445, 0.4459453341390615, 0.49986072026001255]]	093100474, 0.2813724838117147, 0.3931377889180585], [0.1967265229467596, 0.1624504792712471, 0.2838108482239888]]	373099245, 0.483014727513794, 0.4491439640694529], [0.291861501310331, 0.42048874311745715, 0.3863923106809487]]	0803521226007, 0.3437543855174958, 0.5147087735549947], [0.2518134982456162, 0.3437543855174958, 0.4178629689143748]]
BC3	[[0.5973646753916472, 0.6456071084580294, 0.6859536502822656], [0.23288305431037484, 0.1866	[[0.5750575447316579, 0.5107133714207652, 0.4780520241030628], [0.280357465674917, 0.202	[[0.4881700260305526, 0.4565736558385418, 0.42285490971642326], [0.32204615963191485, 0.333	[[0.5359140878268606, 0.5606162295351185, 0.48165254861185947], [0.3484226509679745, 0.302	[[0.4514342165689045, 0.41199237700501135, 0.36747309048587506], [0.35523438585818046, 0.383	[[0.5924034451970386, 0.6210708583724005, 0.5758975100317361], [0.308900425283706, 0.212	[[0.8143633908683121, 0.7776472309656774, 0.8415106807538886], [0.14068624190585735, 0.108	[[0.5080981028301275, 0.46038482735055464, 0.4651948121374656], [0.31697863849222263, 0.263	[[0.7159262049495698, 0.662227142783365, 0.7085008391176951], [0.2821727026320928, 0.295	[[0.44647610143730876, 0.46073801232912115, 0.35110552519255533], [0.48005537386869657,	[[0.7231970762572842, 0.6592156268366167, 0.6580182186821901], [0.3167184317143923, 0.304	[[0.6914830686399951, 0.6341397119390453, 0.600736481819678], [0.33066025977478425, 0.250

	06598 30736 15, 0.3608 97342 23396 613], [0.157 02317 48588 672, 0.1866 06598 30736 15, 0.2912 39588 64421 71]]	14958 18235 5083, 0.316 26345 47570 624], [0.182 50930 25679 6175, 0.109 73205 28669 88, 0.228 54547 42447 7134]]	62906 72927 861, 0.457 30505 19273 263], [0.244 56911 42064 798, 0.239 95372 98014 0697, 0.345 73092 06748 8465]]	09643 25693 794, 0.448 32608 08816 344], [0.295 78490 51645 625, 0.284 03174 42997 222, 0.375 84346 40445 1]]	23916 07784 1846, 0.490 12741 89394 8986], [0.277 20969 50162 7807, 0.275 63445 46982 792, 0.374 93542 39021 032]]	05124 49841 32, 0.355 71609 14668 9676], [0.246 56277 44275 839, 0.193 31820 44931 763, 0.303 14331 33020 796]]	44717 71197 699, 0.154 25846 56800 0237], [0.081 22523 96356 2356, 0.070 71067 81186 5474, 0.124 57309 39615 5174]]	07168 65258 7076, 0.371 02784 84755 147], [0.222 98195 58558 109, 0.164 37518 29517 2257, 0.283 22625 33884 706]]	28613 38183 827, 0.272 40699 27426 661], [0.214 99753 03640 1759, 0.236 17796 48622 8634, 0.247 60800 28615 4136]]	0.395 70161 49332 982, 0.494 94894 41578 9664], [0.417 31997 52447 14, 0.360 74452 53135 851, 0.438 23751 56611 498]]	05242 33175 1503, 0.278 31454 06321 058], [0.237 73397 88691 67, 0.232 19921 89501 729, 0.249 80865 04396 1317]]	29764 12609 9063, 0.273 42408 11802 419], [0.249 48403 56115 3285, 0.175 25720 43203 5963, 0.239 24623 97702 6305]]
BC4	[[0.35 66424 86392 47254, 0.3791 64502 57447 9, 0.3115 58952 01144 41], [0.470 84446 35699 838, 0.5548 38222 93443 62,	[[0.36 98633 86965 04073 , 0.366 23475 99831 882, 0.288 56781 70662 065], [0.449 66767 62568 663, 0.535 63583 70544	[[0.88 03768 80114 8684, 0.802 23698 44110 768, 0.874 40567 84245 209], [0.141 42135 62373 0953, 0.129 72789 66980 2323,	[[0.67 75535 29290 0976, 0.648 73888 30590 355, 0.681 56967 93455 717], [0.293 84893 68286 553, 0.253 53878 79483 547,	[[0.89 46282 05032 7764, 0.833 23350 27959 357, 0.900 23688 42515 559], [0.151 57165 66510 398, 0.151 57165 66510 398,	[[0.62 46964 48062 2077, 0.672 52590 82112 094, 0.703 88084 64531 288], [0.210 50571 03404 6, 0.171 87719 27587 479,	[[0.89 84013 05159 3012, 0.836 38230 51256 102, 0.893 29233 62808 032], [0.158 48931 92461 1137, 0.147 57731 61594 552,	[[0.32 83221 26925 1524, 0.345 62835 34470 2436, 0.264 22282 53724 147], [0.519 36698 77702 589, 0.590 57226 76367 654,	[[0.29 93392 36239 56993 , 0.305 40933 53441 165, 0.151 37609 96371 3494], [0.543 07066 47227 709, 0.722 72424 75368	[[0.88 25381 05691 1981, 0.804 11291 33116 709, 0.870 10787 91558 21], [0.144 61255 49591 925, 0.128 00713 63717 8823,	[[0.45 14342 16568 9045, 0.411 99237 70050 1135, 0.367 47309 04858 7506], [0.355 23438 58581 8046, 0.383 23916 07784 185,	[[0.34 59169 85458 38934 , 0.384 56685 97124 706, 0.403 58060 77373 9357], [0.462 71758 10505 9946, 0.492 45776 53379

	0.6641750668132164], [0.38000526661133577, 0.5548382229344362, 0.5529154497612536]]	405, 0.6260438911353053], [0.37449922025747856, 0.479907459602814, 0.5102204138653698]]	0.10201428866841845], [0.07478057617858211, 0.061557220667245796, 0.08660254037844385]]	0.2851935883567991], [0.22562383289452798, 0.2107435899344471, 0.2581071309508662]]	0.09976311574844397], [0.08963949812604985, 0.09330329915368073, 0.09665910224658812]]	0.3381216689031207], [0.1563870564357805, 0.1718771927587479, 0.27455219468270814]]	0.0976828914091175], [0.09426018986861225, 0.08808647949360217, 0.0944087511294902]]	0.6720441737639011], [0.42620709106682153, 0.5815383639907516, 0.5712045268407879]]	281, 0.7820050618434328], [0.4625693065682241, 0.7227242475368281, 0.6453824415643978]]	0.10094510324960805], [0.07668373434192788, 0.05981155994256576, 0.08558849297048524]]	0.49012741893948986], [0.27720969501627807, 0.2756344546982792, 0.37493542390210316]]	6654, 0.586279462136271], [0.37740824629265096, 0.49245776533796654, 0.5137811560997684]]
BC5	[[0.7479019427624862, 0.6701975461372252, 0.7494063831863638], [0.21435469250725864, 0.19663072216374344, 0.20354526576845	[[0.7708045461007671, 0.6975747854667782, 0.7373422821050452], [0.2841613506114255, 0.2717361446466631, 0.2261400238213	[[0.7283655313192361, 0.7173937184663094, 0.7738446820627436], [0.20938786151221317, 0.1718006496841355, 0.2365823040439	[[0.45134636871887923, 0.44336460879307005, 0.3176566393306457], [0.4363088285510481, 0.41511336955881, 0.51499143	[[0.8534921974208238, 0.8267137892112134, 0.8851301645002965], [0.12754245006257908, 0.1000000000000002, 0.1313263902201	[[0.5473027613434782, 0.5791422325828403, 0.5310477649777208], [0.308900425283706, 0.28763260477568203, 0.4477694926940	[[0.48378573809826764, 0.4916996351740337, 0.5437782317222596], [0.31568730599953077, 0.2861938162210511, 0.40612619	[[0.5469253608117206, 0.5820938030229239, 0.5654505385700893], [0.325861743504041, 0.2501757527140844, 0.3893659854693	[[0.3991368393334994, 0.3503062704954223, 0.3291796067500631], [0.40344407339917343, 0.4187757230244263, 0.5263232709973	[[0.3469016321443731, 0.3581687090746294, 0.19981941748101995], [0.49088791102066803, 0.6656775051475124, 0.7326539313491	[[0.7665874927332872, 0.6946785853659829, 0.7460329566475103], [0.2778906963163291, 0.27538900955845946, 0.2285352426907	[[0.6589356481716686, 0.5801005286554449, 0.6218529141437293], [0.36111457251668955, 0.42595146721344257, 0.3611198450855

	217], [0.13406586636449988, 0.11486983549970348, 0.16741847610508567]]	1243], [0.18685964094232763, 0.19663072216374342, 0.20593748808030065]]	7404], [0.14734508904170038, 0.14727333575346888, 0.20719332140095068]]	16110011], [0.38000526661133577, 0.34968409520721466, 0.42948661365925106]]	8833], [0.0757858283255199, 0.0757858283255199, 0.11486983549970349]]	4304], [0.2571760398377521, 0.2789001554324569, 0.3681199371346908]]	817811774], [0.24035193953495487, 0.22973967099940695, 0.333096455238438]]	2016], [0.2657696710181807, 0.23521580450493468, 0.3365865436338598]]	359], [0.275420089330317, 0.30119317092298453, 0.4006825528784535]]	905], [0.4606953866317116, 0.6656775051475124, 0.6084034336336382]]	3414], [0.18222210660586005, 0.2023695881835618, 0.20837742327184397]]	58], [0.23524235042102998, 0.34598009997557316, 0.3148046661261666]]
BC6	[[0.8197224362268004, 0.7450490243203607, 0.7878679656440357], [0.223606797749979, 0.27386127875258304, 0.19999999999999998], [0.15811388	[[0.841886116991581, 0.7763932022500211, 0.8129171306613029], [0.22360679774997902, 0.18708286933869708, 0.15], [0.15, 0.12247448713915886,	[[0.6754177305587524, 0.603854310146812, 0.6434392723220004], [0.33509298998381465, 0.39487009716696403, 0.3403874735441103], [0.23183383	[[0.8089453991300068, 0.7594059901752208, 0.8263023267780313], [0.1447923118233402, 0.11293469354568554, 0.15425846568000237], [0.08122523	[[0.486708184347884, 0.486708184347884, 0.28218507020913297], [0.5, 0.3777177258655039, 0.47665072847196555], [0.4547662880414811, 0.328	[[0.6974510899265428, 0.633944548277281, 0.6637933828463051], [0.3028944638996392, 0.3637018434559524, 0.31890614631857883], [0.23089464	[[0.7049490614663081, 0.6270987758821835, 0.6267206010322508], [0.2752922598358332, 0.21128146516413282, 0.24309848950391433], [0.18467166	[[0.8069217963313478, 0.7245274398776408, 0.7941348619197244], [0.19081741026573443, 0.16890642907795925, 0.15998720695258803], [0.11316779	[[0.8771771973884209, 0.8078115561761462, 0.8610660398201317], [0.1736976732219687, 0.15164550413138492, 0.1135376125207241], [0.10359666	[[0.8121639792911375, 0.7945054661450728, 0.8553874450408074], [0.1465078025791761, 0.11486983549970353, 0.1653301298873921], [0.09206568	[[0.4532135467042694, 0.4290009058824177, 0.46972975919299065], [0.34106435182833134, 0.3194275505495154, 0.42825840755341976], [0.24646887	[[0.6192692122568242, 0.5626551704226888, 0.543405978527376], [0.4024883779254547, 0.37919553292794633, 0.373978449458314], [0.28997730

	300841897, 0.19364916731037085, 0.18027756377319948]]	0.14142135623730948]]	111981382, 0.320734182673286, 0.29897449432765855]]	963562356, 0.0659753955386447, 0.12104040754193453]]	7874679155652, 0.4198994713445551]]	63707942, 0.29541769390627776, 0.28184390712104307]]	200173746, 0.12247448713915886, 0.1966307221637434]]	707266363, 0.09065737227377665, 0.1328201239943334]]	070047535, 0.08558849297048525, 0.10413797439924104]]	85889753, 0.09330329915368074, 0.14309690811052556]]	228911765, 0.2297396709999407, 0.3382709397914479]]	673976435, 0.31036911478307194, 0.33010888478979766]]
BC7	[[0.657345575521427, 0.5936571588066071, 0.5585135111384716], [0.33066025977478425, 0.33951115227121315, 0.34418168043939984], [0.26022304636322574, 0.252843552	[[0.7607537602297368, 0.69001620249033326, 0.7563242810931292], [0.26550078178387804, 0.28284271247461906, 0.2421538986101641], [0.16076601938044396, 0.21435469	[[0.7842330720025407, 0.774786575144497, 0.8338837960064573], [0.14235308418790651, 0.10413797439924108, 0.18119491591942383], [0.08705505632961243, 0.08122523	[[0.4615653563606088, 0.40758805783994234, 0.3176566393306457], [0.4109329893257313, 0.3478416572492939, 0.4565545610702242], [0.2865819013049895, 0.23521580	[[0.5006503858401951, 0.5272295269159912, 0.4549330350215509], [0.35768499025935024, 0.3541172744654273, 0.5060604446216245], [0.2989177852897547, 0.34336636	[[0.3771420603533483, 0.3771420603533483, 0.18607437503031843], [0.5409448743222639, 0.5637318764256111, 0.6471987641774081], [0.46445084884268545, 0.53002197	[[0.3937133733958408, 0.31134918151969093, 0.2885678170662065], [0.40565796928020276, 0.40953450221584387, 0.5209875665261621], [0.2465627744275839, 0.26390158	[[0.31373771002257356, 0.3196830694994178, 0.15137609963713494], [0.5290077185750781, 0.7180749113262792, 0.777278527424596], [0.46746872557767366, 0.718	[[0.2869590168135985, 0.31134918151969104, 0.2885678170662065], [0.5352688995332952, 0.6062866266041593, 0.6874472154455905], [0.4069628124848408, 0.60628662	[[0.5257118780441377, 0.47057357353910767, 0.42796682207063863], [0.33144540173399867, 0.2561390058855914, 0.36329131022511685], [0.23447611751113964, 0.15518455	[[0.8336773095923113, 0.7804715508014144, 0.8487873927333891], [0.14901822153424457, 0.12457309396155176, 0.14075213996868363], [0.08590032484206776, 0.07578582	[[0.8123971740901665, 0.7656327088407902, 0.8241042661281225], [0.19288881697224614, 0.17180064968413553, 0.17789962837288348], [0.11900131372982206, 0.12820888

	1825442, 0.2905269780969179]]	25072586, 0.21490178425748652]]	963562356, 0.14727333575346885]]	450493468, 0.3525175850184141]]	82416982, 0.41724980618920443]]	61507747, 0.5473024793147035]]	21545789, 0.3780030705234649]]	0749113262792, 0.6406173216406451]]	66041593, 0.5866023919182545]]	739153597, 0.27663237344451835]]	83255199, 0.11760790225246738]]	539868158, 0.15816945113203257]]
BC8	[[0.5684661440050813, 0.5658539187892799, 0.6201711035338131], [0.24208081508386917, 0.1966307221637434, 0.3298769776932235], [0.16505444239489886, 0.1414213562373095, 0.2537	[[0.5380676579067796, 0.455217157982013, 0.4828901529353099], [0.26985656953471265, 0.2191187578305749, 0.3264196222663065], [0.1692550613990929, 0.11161231740339042, 0.230	[[0.8196277373432074, 0.7945054661450728, 0.8553874450408074], [0.13669661332393265, 0.10413797439924108, 0.15425846568000237], [0.08122523963562356, 0.0757858283255199, 0.128	[[0.3424992681931096, 0.3660427230155546, 0.333807089523124], [0.48478473600973215, 0.5278031643091579, 0.6654618182489794], [0.333096455238438, 0.5278031643091579, 0.544	[[0.4208307527066394, 0.3845668597124704, 0.4035806077373937], [0.37584346404451, 0.36692590185696067, 0.47620689805463084], [0.2591737256940702, 0.2639015821545788, 0.369	[[0.6287267817366242, 0.5955488517199801, 0.6566336317583019], [0.31791215240501564, 0.32490095854249423, 0.345145075413034], [0.22562383289452798, 0.282842712474619, 0.305	[[0.5049131742572497, 0.5004401394179432, 0.5030533041753258], [0.32217788037404227, 0.28239763223054576, 0.43257241980968075], [0.21213203435596428, 0.2232246348067809, 0.334	[[0.5535507303864382, 0.4521446829656034, 0.4868663393987981], [0.24598736149382025, 0.20131766230417636, 0.3193271111468849], [0.13509600385206136, 0.09330329915368074, 0.210	[[0.7559737289332266, 0.683560368817981, 0.7481865017543836], [0.27175841800094996, 0.30119317092298453, 0.2446339225541934], [0.1795818185524432, 0.2282617394438828, 0.221	[[0.7540126385061796, 0.6589924330564443, 0.7181458035106432], [0.20912791051825466, 0.20214116085399314, 0.2086325194326287], [0.12702576134906052, 0.10580282282316986, 0.161	[[0.7976304118164381, 0.734202270503987, 0.8023195349295731], [0.2037958135727142, 0.19432833157261473, 0.18958138078258682], [0.11900131372982202, 0.13195079107728944, 0.162	[[0.7590676419523695, 0.6848420453058439, 0.7329415912936832], [0.2706946495564911, 0.31867087698713253, 0.25485654040770334], [0.18807380464665338, 0.24150736375689694, 0.227

	5895777240354]]	05120302578358]]	20888539868153]]	8593790858195]]	52327238210037]]	28918390668724]]	019995353231]]	08086111472218]]	33558977570758]]	44753837722164]]	52962704095614]]	9307230070125]]
BC9	[[0.40266241240767475, 0.42309484545158027, 0.3234426546583802], [0.4573050519273263, 0.5007974522196028, 0.5908353878125555], [0.42448047852748455, 0.48559337483020376, 0.509169459609082]]	[[0.7708045461007671, 0.6794940642039581, 0.7227903049837219], [0.21384691999823763, 0.17126038536658944, 0.18400548070445832], [0.1275424500625791, 0.08558849297048525, 0.14479231182334015]]	[[0.6030218289827184, 0.6100797308527083, 0.616617388311129], [0.25150087664143933, 0.18140308320749868, 0.3196132385845426], [0.17797973613448612, 0.13903891703159094, 0.25209805723751366]]	[[0.6820878475949843, 0.5887978736641595, 0.6236848040614951], [0.24564560522315806, 0.24726399499410384, 0.2752922598358332], [0.15991595891483362, 0.13870955573360902, 0.208653542662936]]	[[0.8509817784657553, 0.800473768503112, 0.8649039961479386], [0.16421395049627785, 0.15157165665103983, 0.1428074255166131], [0.09552730043499653, 0.10717734625362933, 0.12847351571234394]]	[[0.4862864785168889, 0.4347874369326188, 0.33459122589201795], [0.40029178022608636, 0.3202428169458657, 0.42842227654983933], [0.2865819013049896, 0.21324046753679737, 0.33333197949525634]]	[[0.9082685245357598, 0.8575625235618866, 0.9169418980032286], [0.12457309396155176, 0.11486983549970353, 0.08684883661098433], [0.06977274470074858, 0.07071067811865475, 0.08218759147586129]]	[[0.689630885216928, 0.6309611638994534, 0.7010822147102452], [0.30527975432498194, 0.3249009585424943, 0.29383578176056274], [0.21051447976758222, 0.2639015821545789, 0.26576967101818066]]	[[0.5880862838972469, 0.5661380729090284, 0.49735701096045015], [0.4070905315369044, 0.31714628558598124, 0.36892642287740446], [0.3435258073385373, 0.2656402479886668, 0.33264538081537726]]	[[0.5497733760679797, 0.5814390820184308, 0.5426863514649454], [0.3171121202991685, 0.2682511946010101, 0.425304176550139], [0.2518134982456162, 0.25612833587207157, 0.35328278144982056]]	[[0.5052463523164721, 0.43803394389263184, 0.34023364228839215], [0.34657242157757323, 0.3134550679703656, 0.4227335859912999], [0.25448064416866434, 0.19286026411134108, 0.31255648056014146]]	[[0.41485099221155686, 0.3817727319611802, 0.24549737007568195], [0.4070905315369044, 0.5104663696212918, 0.6048504290664437], [0.3496920889915011, 0.40977257077587087, 0.4672817856608543]]

BC10	[[0.44702572767224047, 0.40208696284493006, 0.3291796067500631], [0.363250314627929, 0.4081032070680394, 0.5137135214831111], [0.2872755144411883, 0.29351725098327297, 0.3889793612220931]]	[[0.5150094799844694, 0.4755955759149243, 0.4083920216900384], [0.363250314627929, 0.2787875646837609, 0.38528514111233325], [0.27253348248922454, 0.1856366091316878, 0.305140515885586]]	[[0.6182656018266974, 0.6165917244649679, 0.6443240493049538], [0.20804085458682484, 0.16898168267814762, 0.31547867224009657], [0.1379729661461215, 0.121535528531018, 0.23223359592270018]]	[[0.7374701896930138, 0.6701975461372252, 0.7494063831863638], [0.229739670999407, 0.21689435423953973, 0.21815441427552398], [0.1519585089375572, 0.14142135623730948, 0.18685964094232763]]	[[0.5218237501049815, 0.4903775617542717, 0.34555608669607096], [0.4162766037009366, 0.2954423079454385, 0.4000902912594899], [0.333096455238438, 0.20964813563147375, 0.32875036590344514]]	[[0.649829404201092, 0.6973541812231013, 0.7298079922958773], [0.1908389454809088, 0.14962778697388449, 0.31547867224009657], [0.1379729661461215, 0.14962778697388449, 0.25316675083159673]]	[[0.199999999996, 0.19999999999999996, 0.09999999999999998], [0.6500000000000001, 0.8, 0.85], [0.45, 0.8, 0.7]]	[[0.4057393049658742, 0.4057393049658742, 0.2062746066806228], [0.5269369760308917, 0.5190036338267899, 0.6073192375499655], [0.4644508488426855, 0.4805039960518354, 0.5175157965611904]]	[[0.4029066307576339, 0.4132075245539063, 0.29430705823732695], [0.5173339828067044, 0.4606520588377476, 0.5561935337187188], [0.4279407267580153, 0.42648093507359475, 0.48439751936534703]]	[[0.8197224362268004, 0.7450490243203607, 0.7878679656440357], [0.223606797749979, 0.27386127875258304, 0.19999999999999998], [0.15811388300841897, 0.19364916731037085, 0.18027756377319948]]	[[0.40849694534867453, 0.3491996149596146, 0.2824835471318965], [0.4330715734932712, 0.4103798043447871, 0.5184823396640459], [0.2865819013049896, 0.2861938162210511, 0.39426515499674125]]	[[0.6729584927291947, 0.683286326997244, 0.7367235591331525], [0.16352075363540267, 0.11293469354568554, 0.24999999999999992], [0.10000000000000002, 0.08122523963562356, 0.1834629509284803]]

Table A.4. Deneutrosophic decision matrix.

BCS	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
BC1	0.7071795029251766	0.7100530519674926	0.7723359097226292	0.6163120686350174	0.7385679334282633	0.4834952859444761	0.4516725727623033	0.6213659635108973	0.6999692216217188	0.7552886801719318	0.734797589817343	0.6293130445987273
BC2	0.770960773416169	0.7942564500353726	0.6642877382884749	0.7595750394006904	0.7293027390408936	0.6127442960049108	0.6905423333466361	0.784238122723173	0.44638994472704807	0.6383424637472606	0.568421822261768	0.5935087462579349
BC3	0.7321719157760916	0.7035914454208717	0.6089462838995889	0.624847136726006	0.5689698255329462	0.698781764044891	0.8626758151578058	0.6537461778751246	0.7223973253060283	0.5313002968218237	0.7120473052018378	0.7180478889031866
BC4	0.4282697754216116	0.4499485774306745	0.8809889609306875	0.7221052274964406	0.87782906754122	0.7505461424617246	0.8790241257276565	0.3958964680412343	0.31146746180989987	0.8814503777767033	0.5689698255329462	0.4673844838074639
BC5	0.7912765001792593	0.7552886801719318	0.7915284252867126	0.5304454296392482	0.882579481632043	0.6434669646767008	0.6403195305647197	0.6656830372803515	0.5319267677145254	0.3589756487124494	0.7541195796453295	0.6354037542582343
BC6	0.7833891094878377	0.8269538987674938	0.6574223562098733	0.8579102586174098	0.5398318956527204	0.6813629442410744	0.7515551813459261	0.8278492830847968	0.865369036209558	0.8577679631791045	0.6107123419251612	0.6260252681078509
BC7	0.6660726692242723	0.7516160960256504	0.8532572665031544	0.576808012595277	0.5862635135766285	0.4108413236900442	0.5339080003335974	0.3181506675112862	0.3797331142600474	0.6555277931436636	0.8624509475630768	0.8266490481272708

BC8	0.7211224779475796	0.6895289600093575	0.8669824420988665	0.4390813964939785	0.5709285626392153	0.6722500441901161	0.6413916577750741	0.7037477645994367	0.7412551165588784	0.7890018009248516	0.8117406756106749	0.7333150937293184
BC9	0.4681435604994295	0.80572483835247	0.7331435641602584	0.7351594942410509	0.8556927594708623	0.5979048393110538	0.9004826813064081	0.6999692216217188	0.6333298525798529	0.6549221878399067	0.6143811738274195	0.4795417591799643
BC10	0.551993302686268	0.6349612376465321	0.7517510490622927	0.776994000753776	0.6133116964211218	0.7731981063624092	0.237499999999999996	0.4423545335696884	0.4802914156359419	0.7833891094878377	0.5303192926507563	0.8075792612441945

Table A.5. Normalized decision matrix.

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
BC1	0.7683	0.6899	0.6006	0.4232	0.5798	0.2005	0.3230	0.5949	0.2986	0.7585	0.6157	0.4507
BC2	0.9440	0.9133	0.2034	0.7652	0.5528	0.5572	0.6833	0.9144	0.7564	0.5347	0.1147	0.3511
BC3	0.8372	0.6728	0.0000	0.4435	0.0850	0.7946	0.9430	0.6584	0.2581	0.3298	0.5472	0.6977
BC4	0.0000	0.0000	1.0000	0.6758	0.9861	0.9375	0.9676	0.1525	1.0000	1.0000	0.1164	0.0000
BC5	1.0000	0.8099	0.6712	0.2181	1.0000	0.6420	0.6076	0.6818	0.6020	0.0000	0.6738	0.4677
BC6	0.9783	1.0000	0.1782	1.0000	0.0000	0.7466	0.7754	1.0000	0.0000	0.9547	0.2421	0.4416
BC7	0.6551	0.8002	0.8981	0.3288	0.1355	0.0000	0.4471	0.0000	0.8768	0.5676	1.0000	1.0000
BC8	0.8067	0.6355	0.9485	0.0000	0.0907	0.7214	0.6092	0.7565	0.2241	0.8231	0.8473	0.7402
BC9	0.1098	0.9437	0.4565	0.7069	0.9216	0.5162	1.0000	0.7491	0.4189	0.5664	0.2531	0.0338
BC10	0.3408	0.4907	0.5249	0.8068	0.2144	1.0000	0.0000	0.2437	0.6952	0.8123	0.0000	0.9469

Table A.6. Theoretical ranking matrix.

BCs	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12

BC1	0.008375778279051524	0.006646174214543255	0.009824563901634055	0.008032977689082897	0.011364141026461128	0.008064292295961692	0.00774009312607316	0.007127828921747176	0.006924430124558881	0.00793875096413066	0.00877616573525471	0.009184803721500857
BC2	0.008375778279051524	0.006646174214543255	0.009824563901634055	0.008032977689082897	0.011364141026461128	0.008064292295961692	0.00774009312607316	0.007127828921747176	0.006924430124558881	0.00793875096413066	0.00877616573525471	0.009184803721500857
BC3	0.008375778279051524	0.006646174214543255	0.009824563901634055	0.008032977689082897	0.011364141026461128	0.008064292295961692	0.00774009312607316	0.007127828921747176	0.006924430124558881	0.00793875096413066	0.00877616573525471	0.009184803721500857
BC4	0.008375778279051524	0.006646174214543255	0.009824563901634055	0.008032977689082897	0.011364141026461128	0.008064292295961692	0.00774009312607316	0.007127828921747176	0.006924430124558881	0.00793875096413066	0.00877616573525471	0.009184803721500857
BC5	0.008375778279051524	0.006646174214543255	0.009824563901634055	0.008032977689082897	0.011364141026461128	0.008064292295961692	0.00774009312607316	0.007127828921747176	0.006924430124558881	0.00793875096413066	0.00877616573525471	0.009184803721500857
BC6	0.008375778279051524	0.006646174214543255	0.009824563901634055	0.008032977689082897	0.011364141026461128	0.008064292295961692	0.00774009312607316	0.007127828921747176	0.006924430124558881	0.00793875096413066	0.00877616573525471	0.009184803721500857
BC7	0.008375778279051524	0.006646174214543255	0.009824563901634055	0.008032977689082897	0.011364141026461128	0.008064292295961692	0.00774009312607316	0.007127828921747176	0.006924430124558881	0.00793875096413066	0.00877616573525471	0.009184803721500857
BC8	0.008375778279051524	0.006646174214543255	0.009824563901634055	0.008032977689082897	0.011364141026461128	0.008064292295961692	0.00774009312607316	0.007127828921747176	0.006924430124558881	0.00793875096413066	0.00877616573525471	0.009184803721500857
BC9	0.008375778279051524	0.006646174214543255	0.009824563901634055	0.008032977689082897	0.011364141026461128	0.008064292295961692	0.00774009312607316	0.007127828921747176	0.006924430124558881	0.00793875096413066	0.00877616573525471	0.009184803721500857
BC10	0.008375778279051524	0.006646174214543255	0.009824563901634055	0.008032977689082897	0.011364141026461128	0.008064292295961692	0.00774009312607316	0.007127828921747176	0.006924430124558881	0.00793875096413066	0.00877616573525471	0.009184803721500857

Table A.7. Real rating matrix.

BCs	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12
BC1	0.006435379507088107	0.004585345494923373	0.005900661753813851	0.0033992166344796026	0.0065892932662627865	0.0016169223707046406	0.0025003905908437566	0.004240283748682173	0.00206769489682316	0.006021784950692969	0.005403084586051782	0.004139796115402404
BC2	0.007907026569123723	0.006069755452404285	0.00199860426675195	0.006146945723630174	0.006282096425314072	0.00449337410538478	0.005289112293622367	0.006517953044829665	0.005237738213266927	0.004244843719381059	0.0010068119369319537	0.003224438784603982
BC3	0.007012037994165824	0.004471434734559574	0.0	0.0035629159822325495	0.000966097378722305	0.006408147952204725	0.007298711061282962	0.00469310159316075	0.0017873168586190165	0.0026183897329769795	0.004801936621511643	0.0064083530763079525
BC4	0.0	0.0	0.009824563901634055	0.005428289035275524	0.01120663626823518	0.0075601702077107286	0.007489571923613888	0.0010872283122413708	0.006924430124558881	0.00793875096413066	0.001021292241534631	0.0
BC5	0.008375778279051524	0.005382798073801994	0.006593781295388164	0.0017523272778280745	0.011364141026461128	0.005177110665948396	0.004702778469911546	0.0048600314005091	0.0041684259360893405	0.0	0.005913644126394543	0.004295508585551347
BC6	0.008193789816783483	0.006646174214543255	0.0017506674883153684	0.008032977689082897	0.0	0.006020490093801467	0.00600141615723294	0.007127828921747176	0.0	0.007578908121479972	0.002124286300205057	0.004055742232142201
BC7	0.005486907477919828	0.005318054600242508	0.008823059994316077	0.0026415439201717844	0.0015394870037272416	0.0	0.0034604607187843804	0.0	0.00607102807237876	0.004505966492838336	0.00877616573525471	0.009184803721500857

BC8	0.00675709053714125	0.004223529141070889	0.00931873172557833	0.0	0.001031041278023022	0.0058176814444563865	0.0047152951836736436	0.005392343743516169	0.0015515719828702772	0.006534039524919813	0.007436209893792972	0.0067986678850324375
BC9	0.0009200214766856602	0.006271930070113104	0.004485267273673445	0.0056786648880167495	0.01047268470443945	0.0041631202726568	0.00774009312607316	0.005339503090048164	0.0029007664673006786	0.004496764612973844	0.0022212306183776467	0.00031080768651943594
BC10	0.0028547152479414667	0.003261562376176989	0.005157258986384864	0.0064810347527551465	0.002436296717137949	0.008064292295961692	0.0	0.001736916447551563	0.004813929404485635	0.006448757391491533	0.0	0.008697273731273401

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