



Measuring Teaching Success in College Foreign Literature Programs: An Evaluation Perspective using Double Framed SuperHyperSoft Set

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Abstract: To assess effectiveness teaching in college foreign literature programs, a complex, multifaceted methodology that considers both student outcomes and pedagogical quality is needed. Since literary courses naturally develop analytical abilities, cultural awareness, and critical thinking, it is more important than ever to create efficient evaluation frameworks. Using both quantitative and qualitative data to gauge efficacy, this study investigates the major markers and variables affecting instructional performance in these programs. Through an analysis of teaching methodologies, curricular alignment, learner engagement, and assessment tactics, the study provides a well-founded viewpoint on how to improve student happiness and academic performance in foreign literature training. We use the multi-criteria decision making (MCDM) approach to deal with different criteria. The CoCoSo method is used to rank alternatives. The Double Framed SuperHyperSoft set is used to deal with criteria values.

Keywords: Double Framed SuperHyperSoft Set; Teaching Success; College Foreign Literature Programs; Evaluation Perspective.

1. Introduction

Courses in foreign literature are essential to liberal arts education because they provide students with an introduction to ideas, cultures, and historical accounts from throughout the world. In addition to improving language proficiency, these classes foster cultural knowledge, empathy, and intellectual curiosity[1], [2]. The effectiveness of instruction in these programs necessitates a thorough and meticulous assessment due to their complex effects.

Teaching foreign literature effectively necessitates a blend of student-centered involvement, pedagogical flexibility, and in-depth subject understanding. Because of the variety of texts,

authors, and cultural settings, teaching is a challenging undertaking that mostly relies on teachers' capacity to generate links between literature and students' real-world experiences.

The whole success of instruction in literary programs cannot be adequately captured by conventional evaluation criteria like exam results and attendance rates[3], [4]. This shortcoming necessitates the use of more flexible assessment techniques that consider a variety of factors, such as the caliber of the discussions, interpretive abilities, cross-cultural competency, and student reflections.

Furthermore, student feedback has become a more significant factor in assessing classroom effectiveness. The opinions of students provide important information about the efficacy of teaching strategies, classroom dynamics, and the general learning environment. By incorporating these viewpoints, assessments are guaranteed to be inclusive of students' opinions in addition to being objective.

The fitness between learning outcomes and course objectives is a crucial factor in assessing teaching effectiveness[5], [6]. The richness of cultural material must be preserved as foreign literature programs constantly adjust to international academic norms. Thus, the attainment of both verbal proficiency and cultural awareness by pupils is a prerequisite for effective instruction.

The teaching of foreign literature has also changed because of technological integration. More interactive and varied information distribution is made possible by digital tools and internet resources[7], [8]. Any strong evaluation system must take into consideration the effects of these advances, particularly as digital literacy emerges as a crucial skill in higher education.

In determining the quality of instruction, institutional support and faculty growth are equally important. Peer observations, pedagogical training, and professional development opportunities all support the enhancement of education[9], [10]. Therefore, the larger ecosystem in which teaching takes place, including departmental objectives and administrative rules, must be considered by evaluation systems.

The purpose of this study is to offer an assessment viewpoint that considers the difficulties of college-level foreign literature instruction. It aims to create a more thorough framework for evaluating teaching success by establishing important performance metrics, looking at stakeholder input, and studying pedagogical outcomes—one that emphasizes both academic rigor and the transformational potential of literature.

The criteria weights and the alternatives' performance in relation to the specified criteria are the two primary data sets that constitute the basis of MCDM problems. Various MCDM techniques, also referred to as ranking methods, are used to aggregate these sets for the purpose of evaluating alternatives. External assessments, whether they be objective assessments based on information gathered from various evaluations, observations, or monitoring, or subjective assessments based on expert judgments, are the primary basis for evaluating how well the alternatives perform in

relation to the criteria[11], [12]. The process by which the weights of the criteria are determined, however, typically takes a different turn.

The weights of criteria are crucial in ranking or choosing the best option in an MCDM situation, when the alternatives' performance values are evenly distributed, and no alternative is completely dominating[13], [14]. Accurately calculating the weights of criteria—whether based on expert opinions, evaluations, judgments, expectations, interpretations, objective values, or a combination of these crucial given the influence. This will subsequently result in more dependable conclusions.

The weights of the criterion are established using MCDM weighting techniques. The MCDM weighing techniques, according to Singh & Pant, can be divided into two primary categories: indirect criteria weighing techniques, which incorporate theories and mathematical functions or models, and direct criteria weighing techniques, which comprise ranking-weight, rating, scaling, and point-allocation procedures.

2. Double-Framed SuperHyperSoft Set (DFSHS)

Between 2018-2024 Smarandache introduced six new types of soft sets: HyperSoft Set, IndetermSoft Set, IndetermHyperSoft Set, SuperHyperSoft Set, TreeSoft Set, ForestSoft Set[15], [16], [17].

Let U be a universal set and the $P(U)$ is the power set of U . Set of attributes $a_1, a_2, \dots, a_n; n \geq 1$ and satisfy the conditions $A_i \cap A_j = \emptyset$ for all $i \neq j$. Let $P(A_i)$ the power set of A_i . The cartesian production of the power set can be defined as[18], [19]:

$$C = P(A_1) \times P(A_2) \times \dots \times P(A_n) \quad (1)$$

The DFSHS over U is then a triple

$$(d_1, d_2; C) \quad (2)$$

$$d_1: C \rightarrow P(U), \quad (3)$$

$$d_2: C \rightarrow P(U), \quad (4)$$

d_1 and d_2 can map each element of C

d_1 and d_2 are two frames for positive and negative or lower and upper criteria.

The DFSHS is used with the MCDM method such as CoCoSo method to rank the alternatives. The steps of this method are shown as:

Create the decision matrix between the criteria and alternatives. Combine the decision matrix and computing the criteria weights using the average method.

Normalize the decision matrix such as:

$$q_{ij} = \frac{x_{ij} - \min_i x_{ij}}{\max_i x_{ij} - \min_i x_{ij}} \quad (5)$$

$$q_{ij} = \frac{\max_i x_{ij} - x_{ij}}{\max_i x_{ij} - \min_i x_{ij}} \quad (6)$$

Determine the power weighted matrix.

$$P_i = \sum_{j=1}^n w_j q_{ij} \quad (7)$$

Compute the total weighted matrix.

$$T_i = \sum_{j=1}^n (q_{ij})^{w_j} \quad (8)$$

Determine the relative weight of every alternative.

$$Z_{ia} = \frac{P_i + T_i}{\sum_{i=1}^m (P_i + T_i)} \quad (9)$$

$$Z_{ib} = \frac{P_i}{\min_i P_i} + \frac{T_i}{\min_i T_i} \quad (10)$$

$$Z_{ic} = \frac{h(P_i) + (1-h)(T_i)}{(h \max_i P_i + (1-h) \max_i T_i)} \quad 0 \leq h \leq 1 \quad (11)$$

Determine the final value of each alternative.

$$Z_i = (Z_{ia} Z_{ib} Z_{ic})^{\frac{1}{3}} + \frac{1}{3} (Z_{ia} + Z_{ib} + Z_{ic}) \quad (12)$$

Rank the alternatives.

3. Case Study

This section shows the case study for Measuring Teaching Success in College Foreign Literature Programs: An Evaluation Perspective using 12 criteria and 8 alternatives.

The criteria and alternatives are:

Teaching Effectiveness {High, Low}; Measures the effectiveness of teaching methods, content delivery, and student engagement.

Student Satisfaction {Very Satisfied, Satisfied}; Reflects how content students are with the course structure, teaching methods, and learning outcomes.

Student Learning Outcomes {Excellent, Good, Average, Poor}; Assesses how well students have met the course objectives and improved their knowledge of foreign literature.

Classroom Participation {Active, Moderate, Passive, None}; Measures the level of student interaction and participation in discussions, debates, and group activities.

Course Material Quality {Excellent, Good, Average, Below Average}; Evaluates the relevance, depth, and clarity of the course materials used, such as textbooks, articles, and online resources.

Instructor Availability {Always Available, Often Available, Occasionally Available, Rarely Available}; Reflects the ease with which students can approach the instructor for help and clarification.

Assessment and Feedback Quality {Timely, Detailed, Constructive, Poor}; Assesses how promptly and effectively the instructor provides feedback on assignments and exams.

Student Engagement with Course Content {Highly Engaged, Moderately Engaged, Low Engagement, No Engagement}; Measures how actively students engage with course materials outside of class (e.g., through independent reading, research, or extra assignments).

Instructor Knowledge of Subject Matter {Expert, Knowledgeable, Adequate, Insufficient}; Evaluates the depth of the instructor's knowledge and their ability to effectively communicate complex ideas in foreign literature.

Course Organization {Well-Organized, Organized, Disorganized, Poorly Organized}; Measures how clearly the course schedule, objectives, and expectations are communicated and followed.

Use of Technology in Teaching {Innovative, Effective, Moderate, None}; Assesses how effectively the instructor uses technology (e.g., multimedia, online platforms) to enhance the learning experience.

Cultural Relevance of Literature {Highly Relevant, Relevant, Moderately Relevant, Irrelevant}; Evaluates how well the course content reflects global perspectives and the cultural diversity inherent in foreign literature.

The alternatives are: Traditional Lecture-Based Approach, Student-Centered Learning, Blended Learning, Socratic Method, Project-Based Learning, Flipped Classroom, Peer Review and Collaborative Learning, Experiential Learning.

Three decision makers created the decision matrix using a scale between 0 and 1. We aggregate the decision matrix and obtain the criteria weights using the average method.

C1: 0.076915883

- This criterion represents a relatively low influence in the overall evaluation, indicating that it has a minor impact compared to other criteria. It may pertain to a supporting aspect of the evaluation, contributing to the overall assessment but not a determining factor in the outcomes.

C2: 0.077285973

- Slightly higher than C1, this criterion still represents a moderate weight in the evaluation process. It suggests that the factor plays an important role but does not dominate the overall evaluation. It could be related to aspects such as class participation or attendance.

C3: 0.078485778

- This criterion is similar to C2 but with a slightly stronger impact. It likely pertains to a factor that contributes more significantly to teaching success or learning outcomes, such as engagement with course materials or application of learning in real-world contexts.

C4: 0.093462453

- C4 holds a substantial weight in the evaluation, indicating that this criterion plays a more prominent role in the overall assessment. It may be linked to a critical element of the teaching process, such as the clarity of course objectives or the effectiveness of assessment methods.

C5: 0.08419132

- This criterion represents a moderately high influence. It may relate to factors like the instructor's responsiveness to student needs or the adaptability of the course content. While important, it is not the most significant factor but still contributes considerably to the overall evaluation.

C6: 0.086176073

- Slightly higher than C5, this criterion also has a moderate-high impact. It could be related to the quality of feedback provided to students, the support for learning outside of class, or the use of technology to enhance learning experiences.

C7: 0.072072888

- This criterion has a relatively low weight, suggesting it may be a supportive factor that is not as central to the evaluation. It may address factors like classroom atmosphere, minor aspects of instructional delivery, or peripheral elements that impact the overall learning experience but do not stand out significantly.

C8: 0.098894408

- C8 is the highest-weighted criterion, indicating that it is one of the most significant aspects in the evaluation process. It may relate to critical areas such as overall teaching effectiveness, alignment of course objectives with learning outcomes, or the ability of the instructor to engage and inspire students.

C9: 0.086710315

- This criterion holds a moderate-high weight and could pertain to factors like the extent to which students feel prepared for exams or assignments or the alignment of teaching methods with student learning styles. It plays a crucial role but is not the highest priority.

C10: 0.076813412

- Similar to C1, C10 has a lower weight, indicating that it is a supplementary factor. It might involve less direct elements of the teaching experience, such as course administration or logistics, that still impact the student experience but do not heavily influence overall teaching success.

C11: 0.088652288

- This criterion is significant, contributing a notable weight to the overall evaluation. It may relate to factors such as the extent to which students' critical thinking and creativity are fostered or how well the course promotes independent research and inquiry.

C12: 0.080339209

- This criterion holds a moderate weight and could be related to factors such as the diversity and relevance of the course materials or the opportunities for students to apply theoretical knowledge in practical settings. While important, it is not a dominant factor in the overall assessment.

The weights indicate the relative importance of each criterion in the evaluation process, with C8 having the highest influence and C7 having the lowest.

We use DFSHS to divide the alternatives into two frames as lower and upper such as:

First frame

{{High, Low}, {Very Satisfied, Satisfied}, {Excellent}, {Active}, {Excellent}, {Always Available}, {Timely}, {Highly Engaged}, {Expert}, {Well-Organized}, {Innovative}, {Highly Relevant}}={A1,A2,A3,A4}

Second frame

{{High, Low}, {Very Satisfied, Satisfied}, {Excellent}, {Active}, {Excellent}, {Always Available}, {Timely}, {Highly Engaged}, {Expert}, {Well-Organized}, {Innovative}, {Highly Relevant}}={A5,A6,A7,A8}

In each frame, we have uncertainty in the first and second criteria. So, we have four groups of each frame such as:

- ✓ {{High}, {Very Satisfied}, {Excellent}, {Active}, {Excellent}, {Always Available}, {Timely}, {Highly Engaged}, {Expert}, {Well-Organized}, {Innovative}, {Highly Relevant}}={A1,A2,A3,A4}

- ✓ {{High}, {Satisfied}, {Excellent}, {Active}, {Excellent}, {Always Available}, {Timely}, {Highly Engaged}, {Expert}, {Well-Organized}, {Innovative}, {Highly Relevant}}={A1,A2,A3,A4}
- ✓ {{Low}, {Very Satisfied}, {Excellent}, {Active}, {Excellent}, {Always Available}, {Timely}, {Highly Engaged}, {Expert}, {Well-Organized}, {Innovative}, {Highly Relevant}}={A1,A2,A3,A4}
- ✓ {{Low}, {Satisfied}, {Excellent}, {Active}, {Excellent}, {Always Available}, {Timely}, {Highly Engaged}, {Expert}, {Well-Organized}, {Innovative}, {Highly Relevant}}={A1,A2,A3,A4}

Second frame

- {{High}, {Very Satisfied}, {Excellent}, {Active}, {Excellent}, {Always Available}, {Timely}, {Highly Engaged}, {Expert}, {Well-Organized}, {Innovative}, {Highly Relevant}}={A5,A6,A7,A8}
- {{High}, {Satisfied}, {Excellent}, {Active}, {Excellent}, {Always Available}, {Timely}, {Highly Engaged}, {Expert}, {Well-Organized}, {Innovative}, {Highly Relevant}}={A5,A6,A7,A8}
- {{Low}, {Very Satisfied}, {Excellent}, {Active}, {Excellent}, {Always Available}, {Timely}, {Highly Engaged}, {Expert}, {Well-Organized}, {Innovative}, {Highly Relevant}}={A5,A6,A7,A8}
- {{Low}, {Satisfied}, {Excellent}, {Active}, {Excellent}, {Always Available}, {Timely}, {Highly Engaged}, {Expert}, {Well-Organized}, {Innovative}, {Highly Relevant}}={A5,A6,A7,A8}

First frame and first group:

Normalize the decision matrix using eqs. (5 and 6) as shown in Fig 1. Determine the power weighted matrix using eq. (7) as shown in Fig 2. Compute the total weighted matrix using eq. (8) as shown in Fig 3. Determine the relative weight of every alternative using eqs. (9-11). Determine the final value of each alternative using eq. (12).

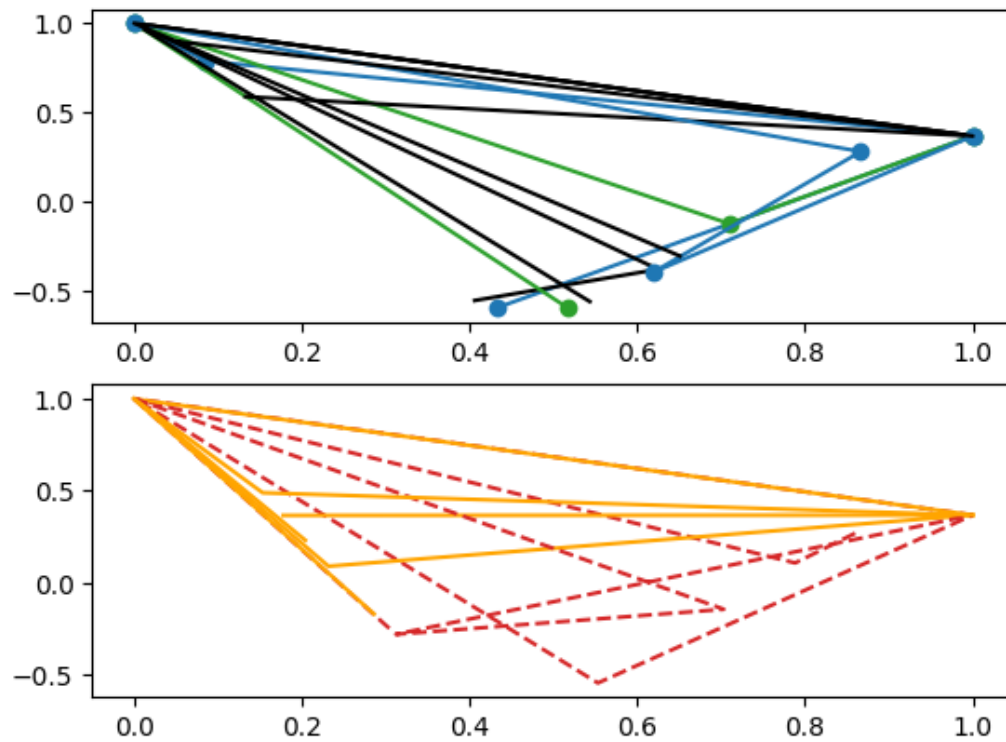


Fig 1. The normalization values.

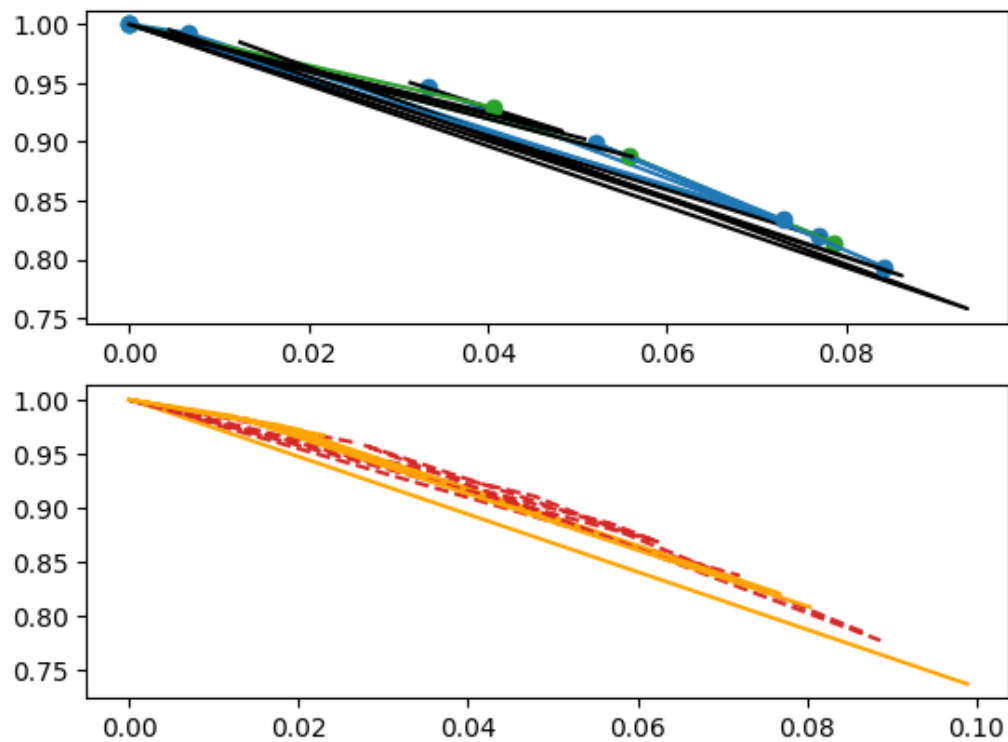


Fig 2. The power weighted matrix.

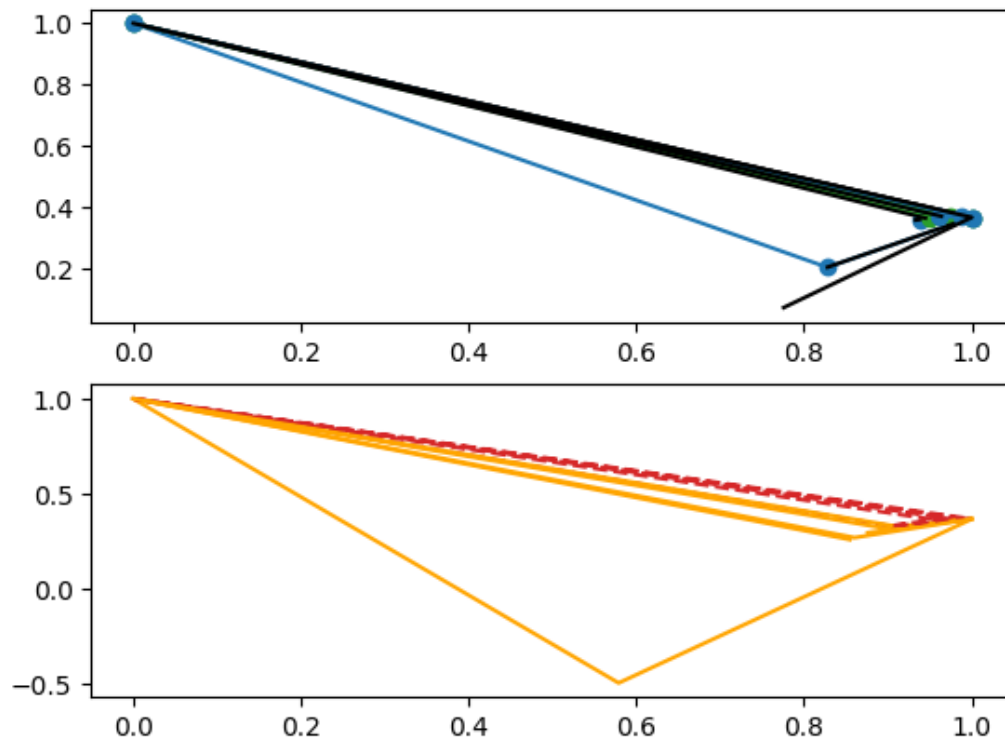


Fig 3. The total weighted matrix.

First frame and second group:

Normalize the decision matrix using eqs. (5 and 6) as shown in Fig 4. Determine the power weighted matrix using eq. (7) as shown in Fig 5. Compute the total weighted matrix using eq. (8) as shown in Fig 6. Determine the relative weight of every alternative using eqs. (9-11). Determine the final value of each alternative using eq. (12).

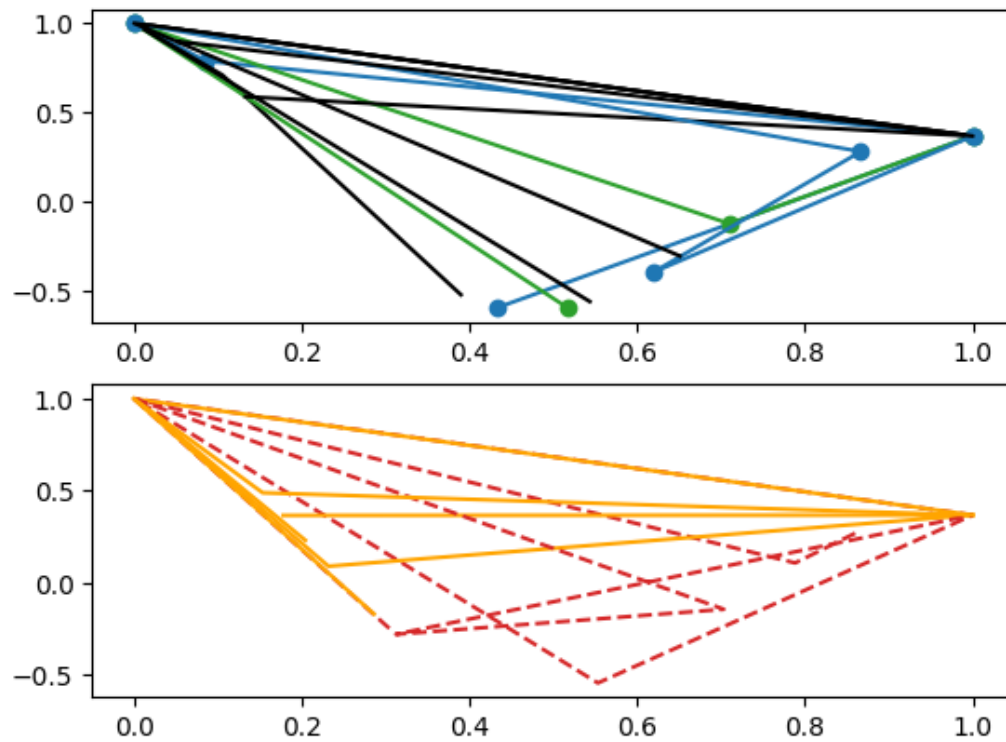


Fig 4. The normalization values.

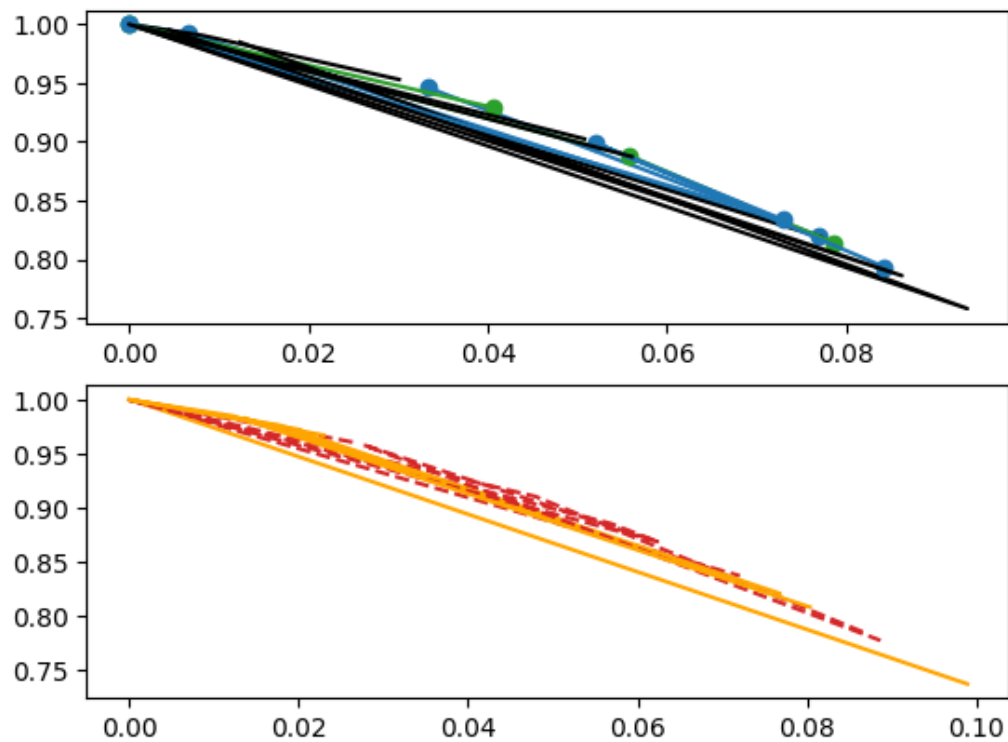


Fig 5. The power weighted matrix.

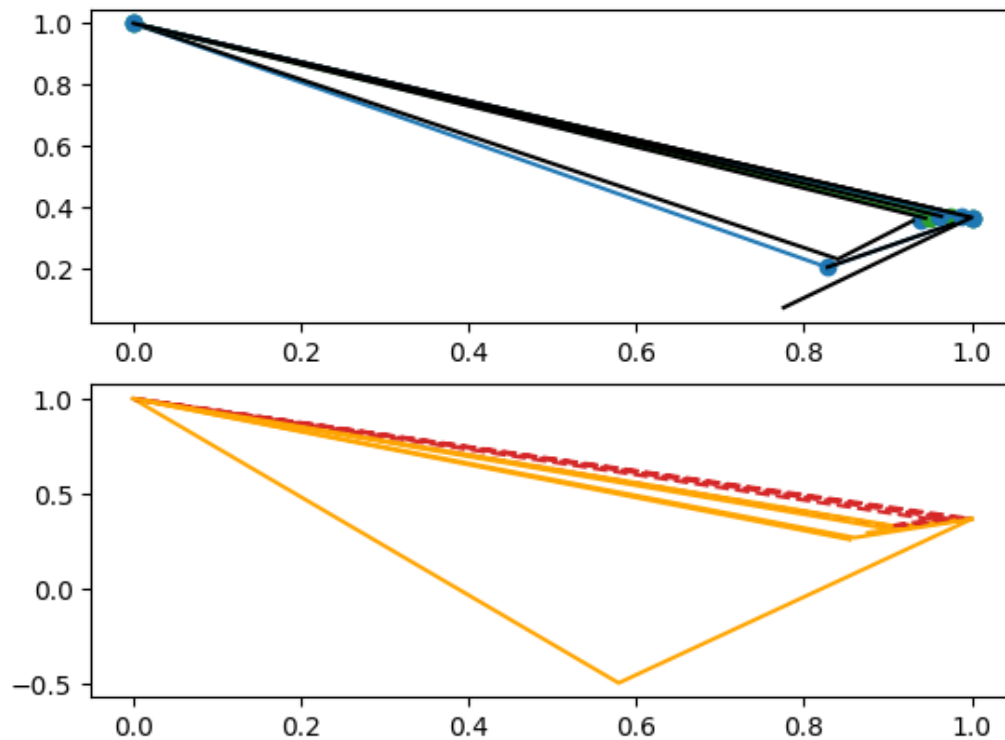


Fig 6. The total weighted matrix.

First frame and third group:

Normalize the decision matrix using eqs. (5 and 6) as shown in Fig 7. Determine the power weighted matrix using eq. (7) as shown in Fig 8. Compute the total weighted matrix using eq. (8) as shown in Fig 9. Determine the relative weight of every alternative using eqs. (9-11). Determine the final value of each alternative using eq. (12).

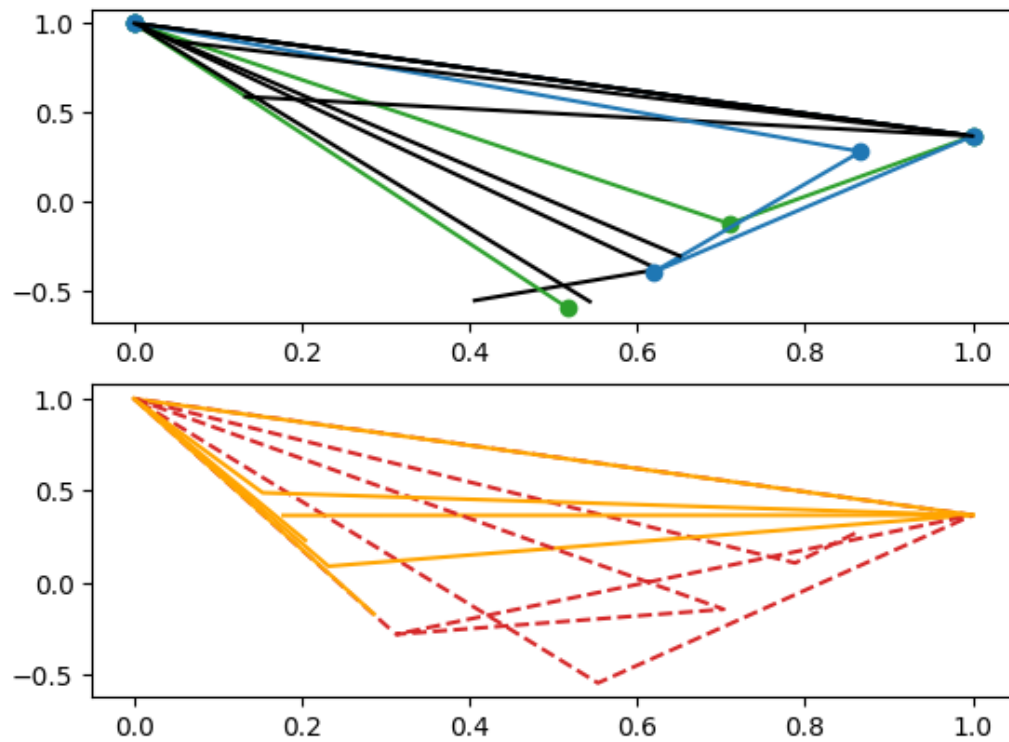


Fig 7. The normalization values.

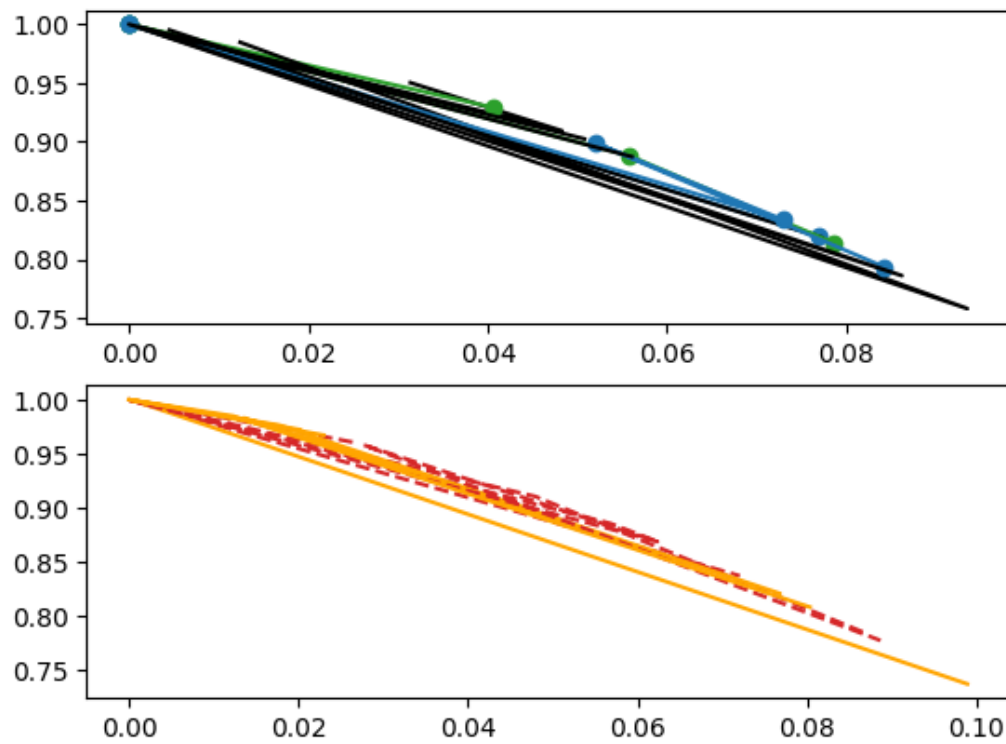


Fig 8. The power weighted matrix.

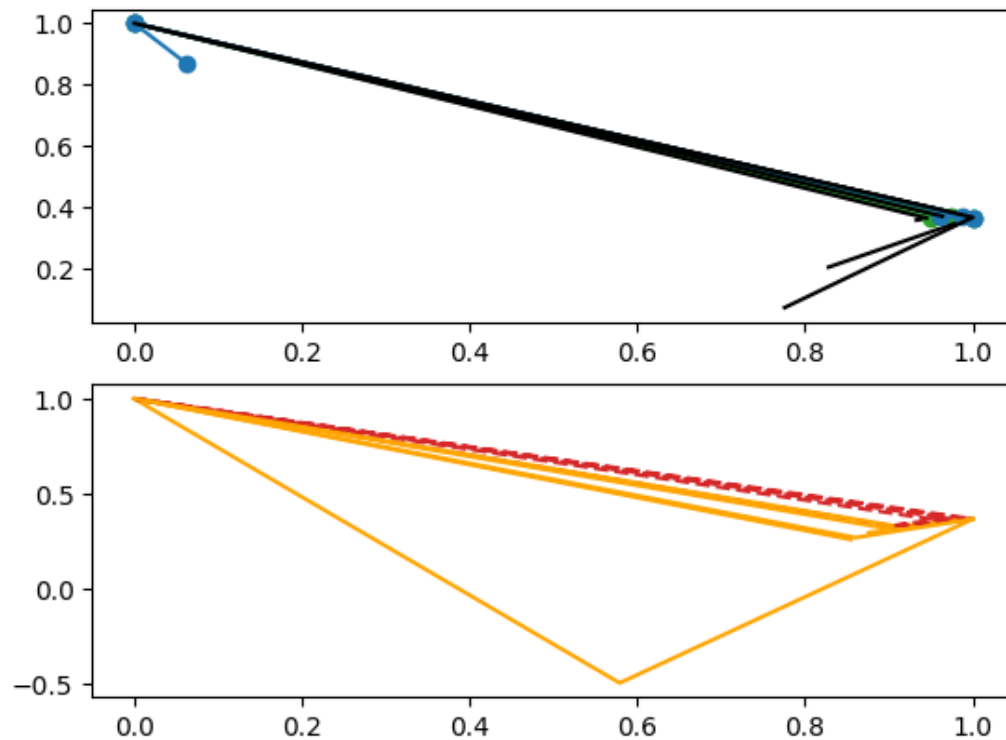


Fig 9. The total weighted matrix.

First frame and fourth group:

Normalize the decision matrix using eqs. (5 and 6) as shown in Fig 10. Determine the power weighted matrix using eq. (7) as shown in Fig 11. Compute the total weighted matrix using eq. (8) as shown in Fig 12. Determine the relative weight of every alternative using eqs. (9-11). Determine the final value of each alternative using eq. (12). The final ranks of the first frame are shown in Fig 13.

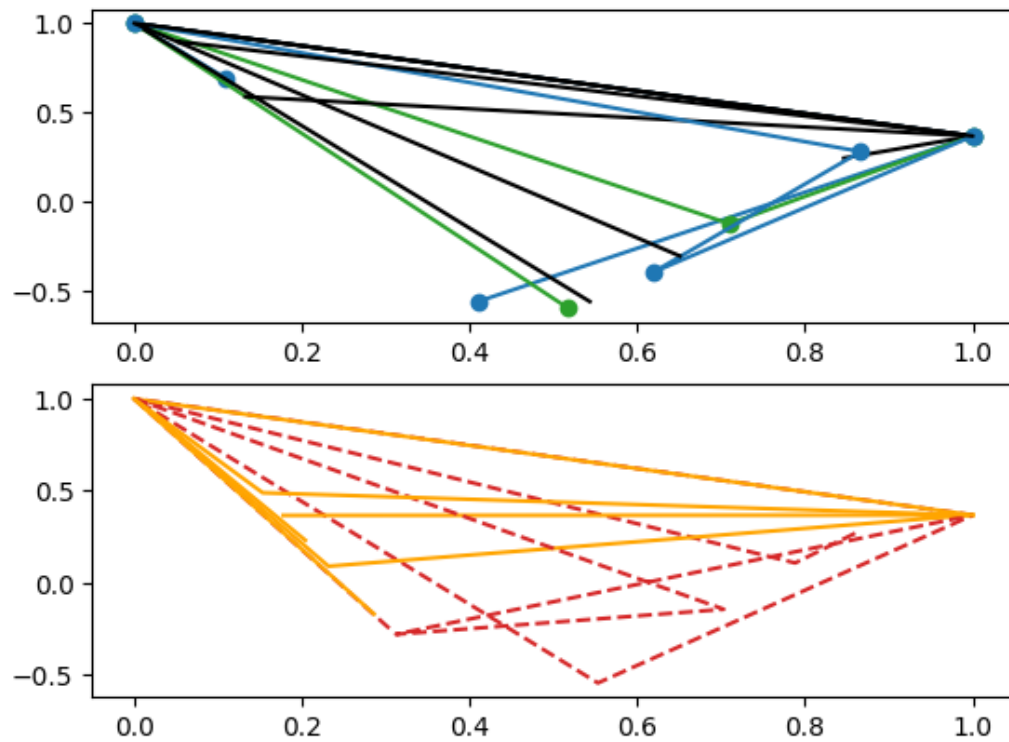


Fig 10. The normalization values.

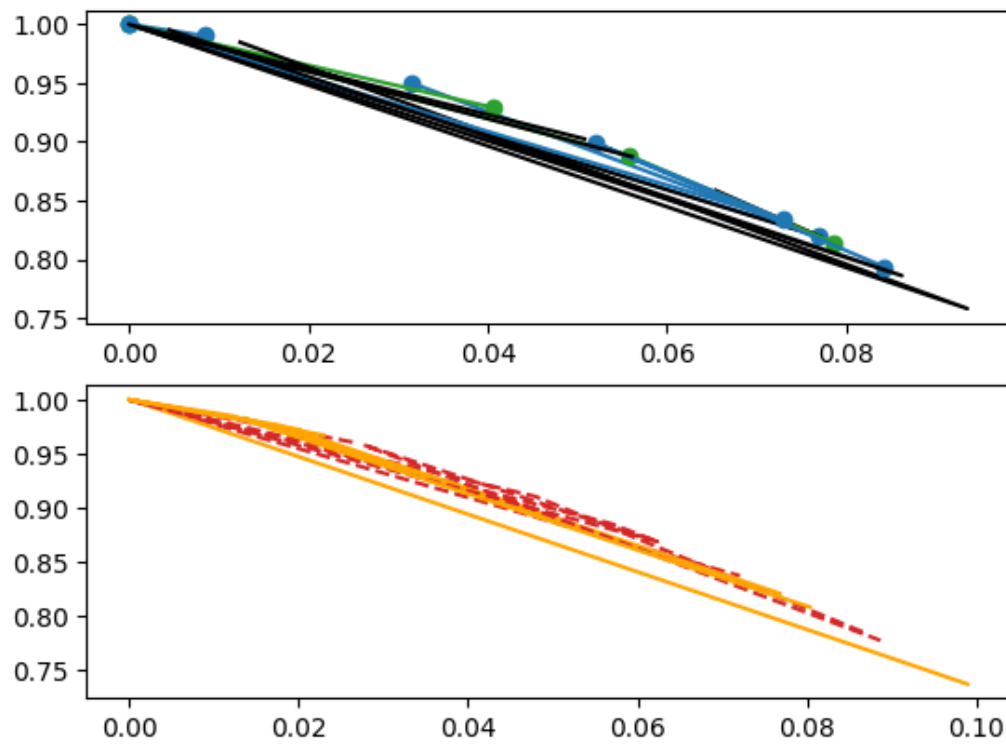


Fig 11. The power weighted matrix.

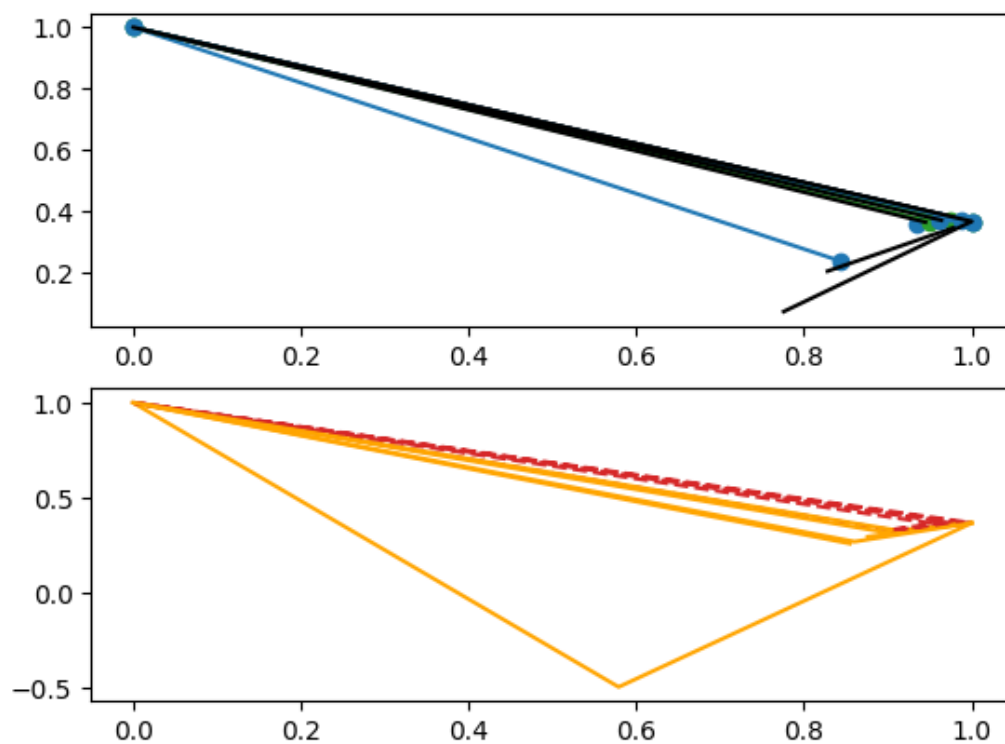


Fig 12. The total weighted matrix.

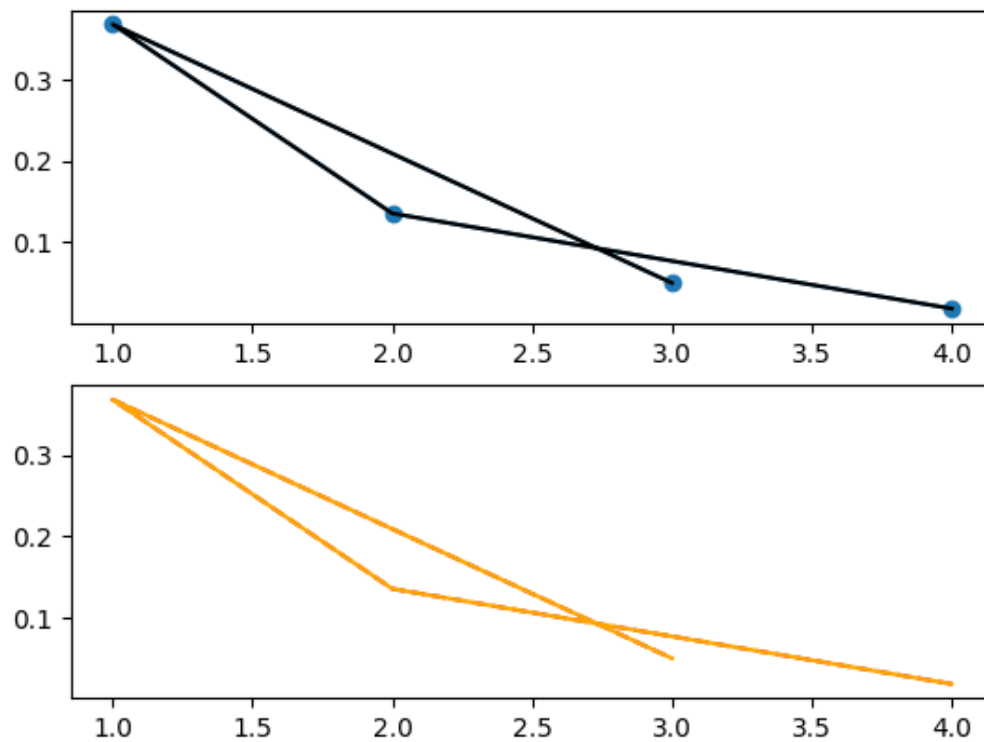


Fig 13. The final ranks.

Second frame and first group:

Normalize the decision matrix using eqs. (5 and 6) as shown in Fig 14. Determine the power weighted matrix using eq. (7) as shown in Fig 15. Compute the total weighted matrix using eq. (8) as shown in Fig 16. Determine the relative weight of every alternative using eqs. (9-11). Determine the final value of each alternative using eq. (12).

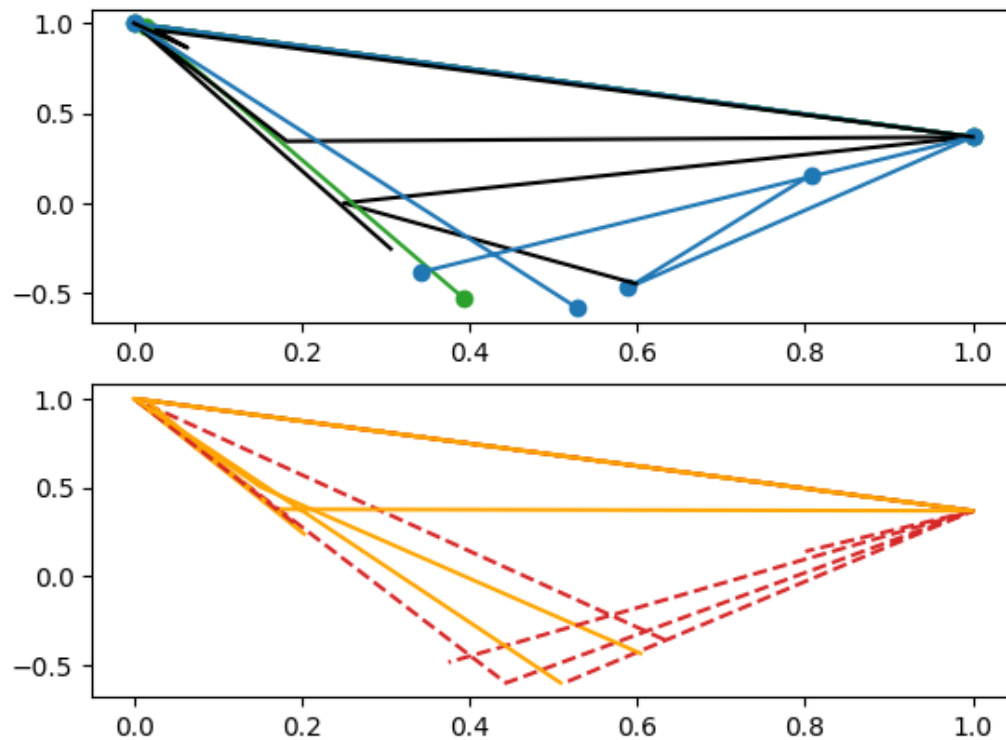


Fig 14. The normalization values.

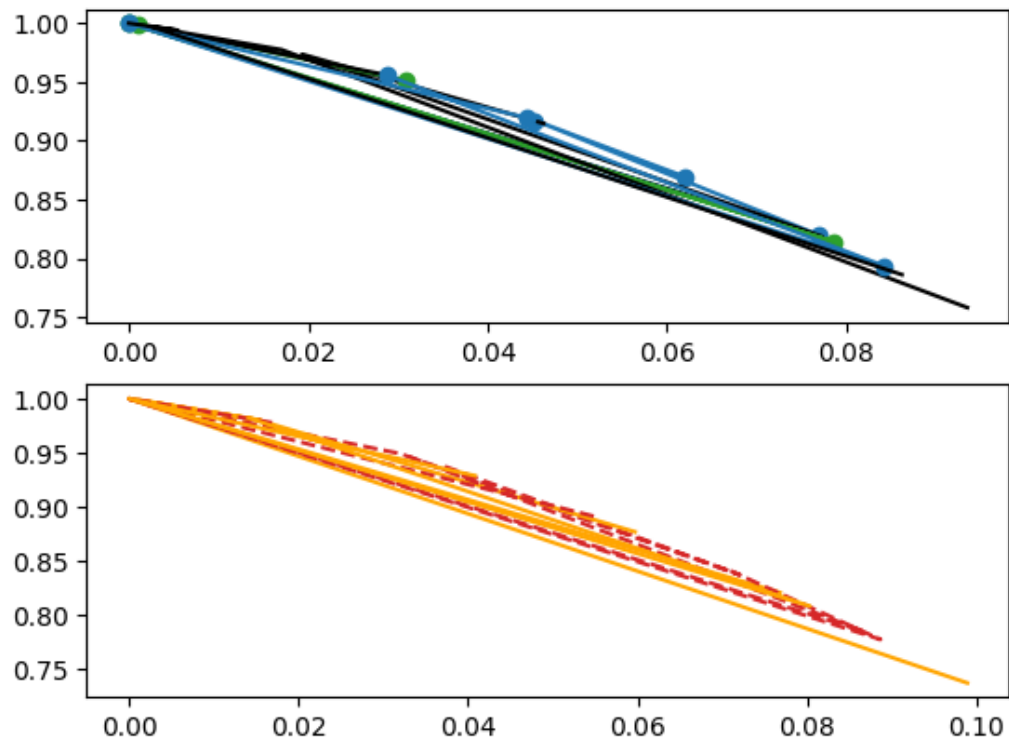


Fig 15. The power weighted matrix.

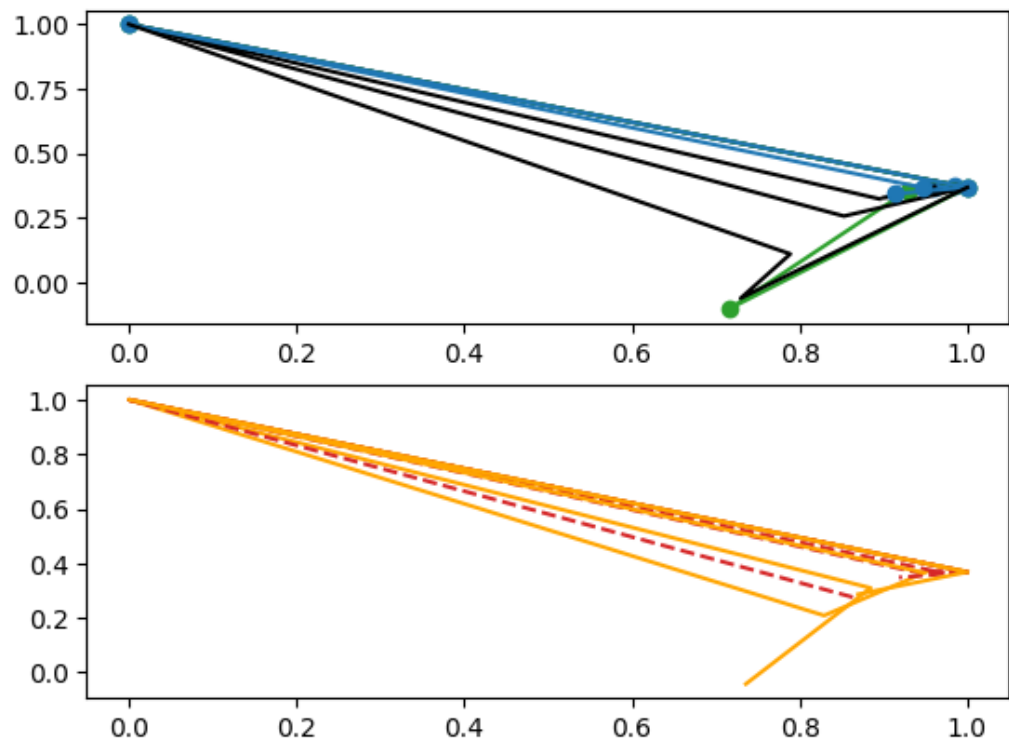


Fig 16. The total weighted matrix.

Second frame and second group:

Normalize the decision matrix using eqs. (5 and 6) as shown in Fig 17. Determine the power weighted matrix using eq. (7) as shown in Fig 18. Compute the total weighted matrix using eq. (8) as shown in Fig 19. Determine the relative weight of every alternative using eqs. (9-11). Determine the final value of each alternative using eq. (12).

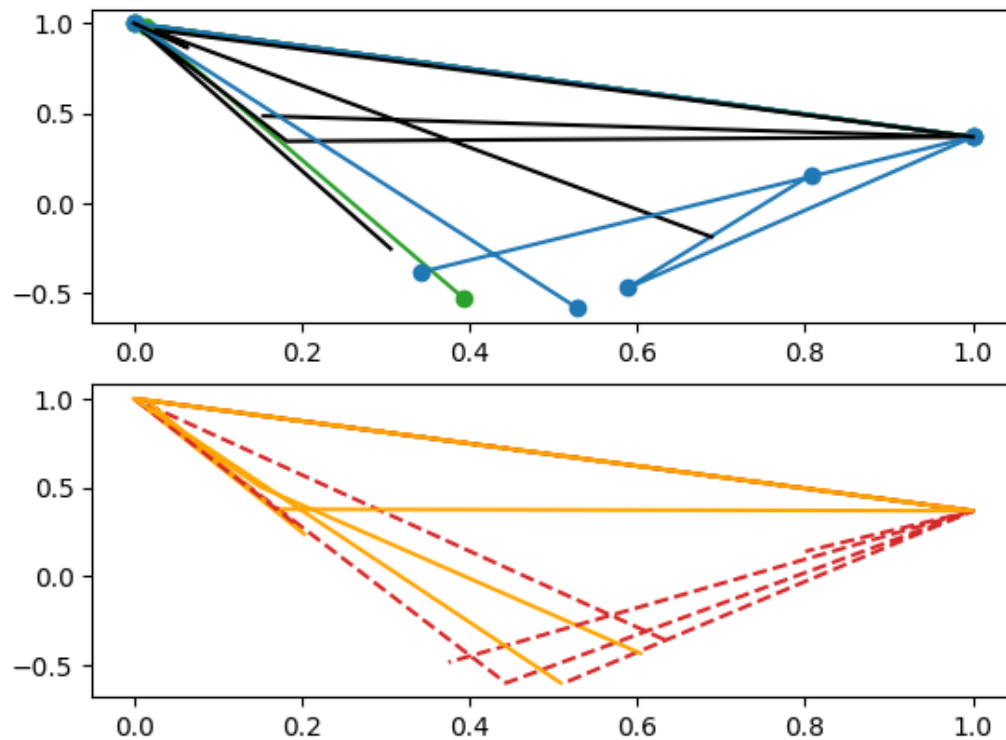


Fig 17. The normalization values.

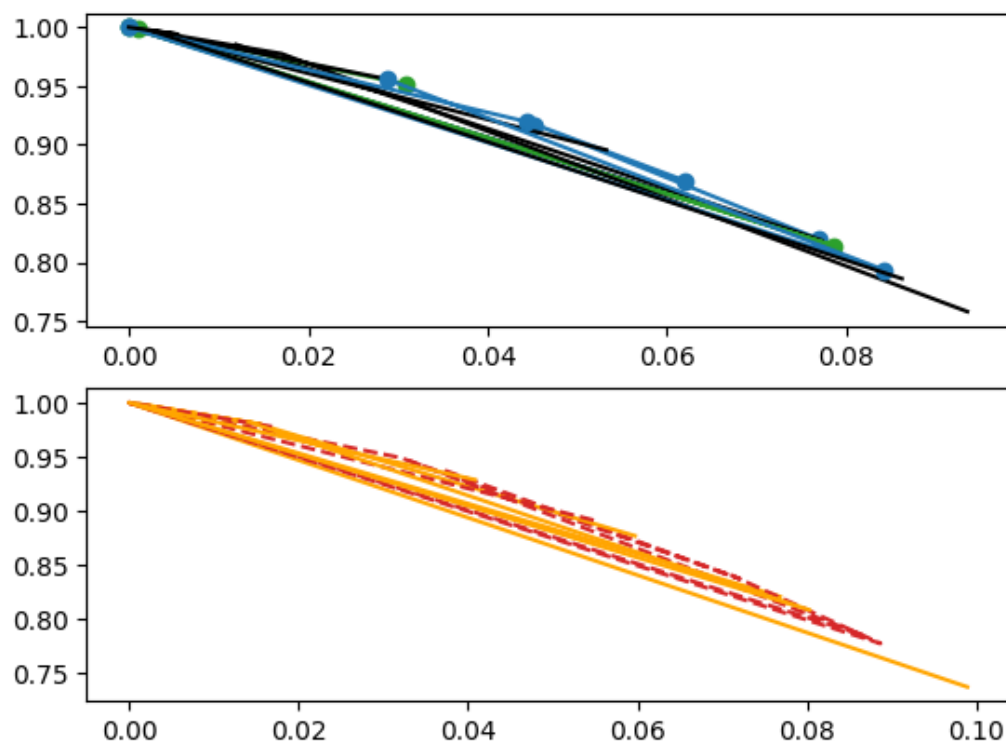


Fig 18. The power weighted matrix.

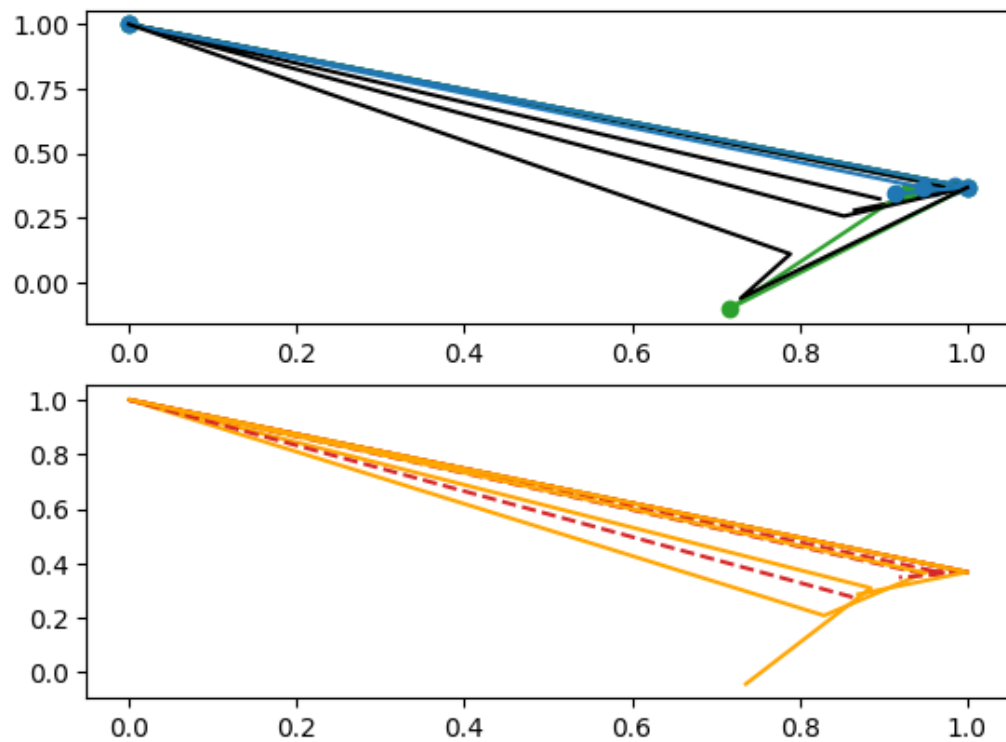


Fig 19. The total weighted matrix.

Second frame and third group:

Normalize the decision matrix using eqs. (5 and 6) as shown in Fig 20. Determine the power weighted matrix using eq. (7) as shown in Fig 21. Compute the total weighted matrix using eq. (8) as shown in Fig 22. Determine the relative weight of every alternative using eqs. (9-11). Determine the final value of each alternative using eq. (12).

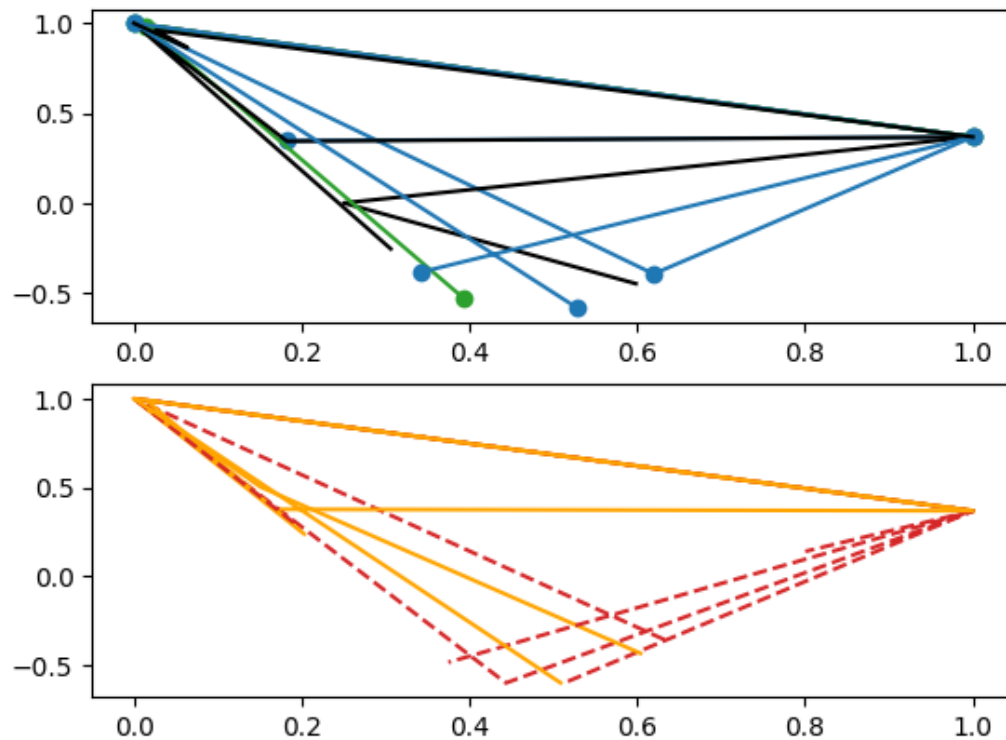


Fig 20. The normalization values.

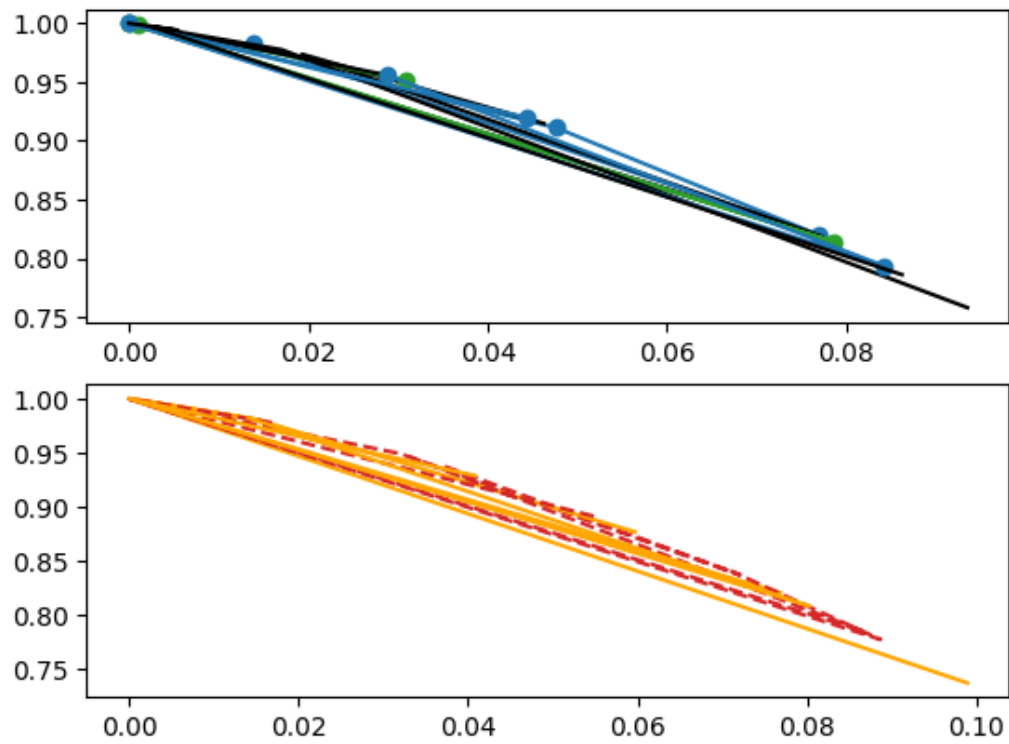


Fig 21. The power weighted matrix.

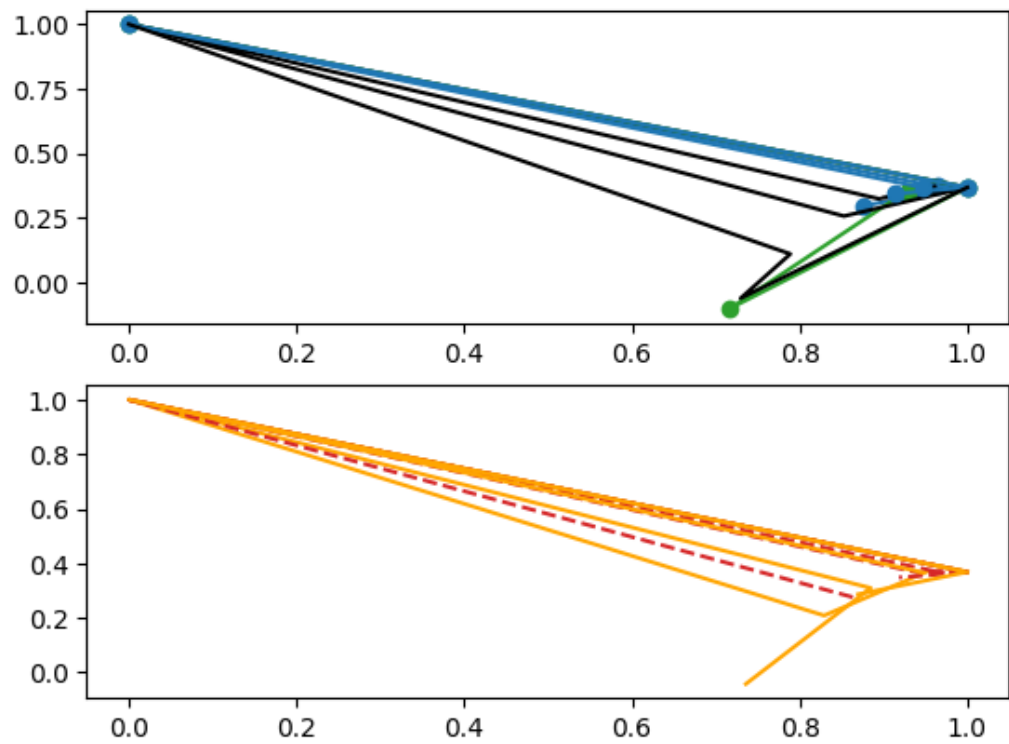


Fig 22. The total weighted matrix.

Second frame and fourth group:

Normalize the decision matrix using eqs. (5 and 6) as shown in Fig 23. Determine the power weighted matrix using eq. (7) as shown in Fig 24. Compute the total weighted matrix using eq. (8) as shown in Fig 25. Determine the relative weight of every alternative using eqs. (9-11). Determine the final value of each alternative using eq. (12). The final ranks of the second frame are shown in Fig 26.

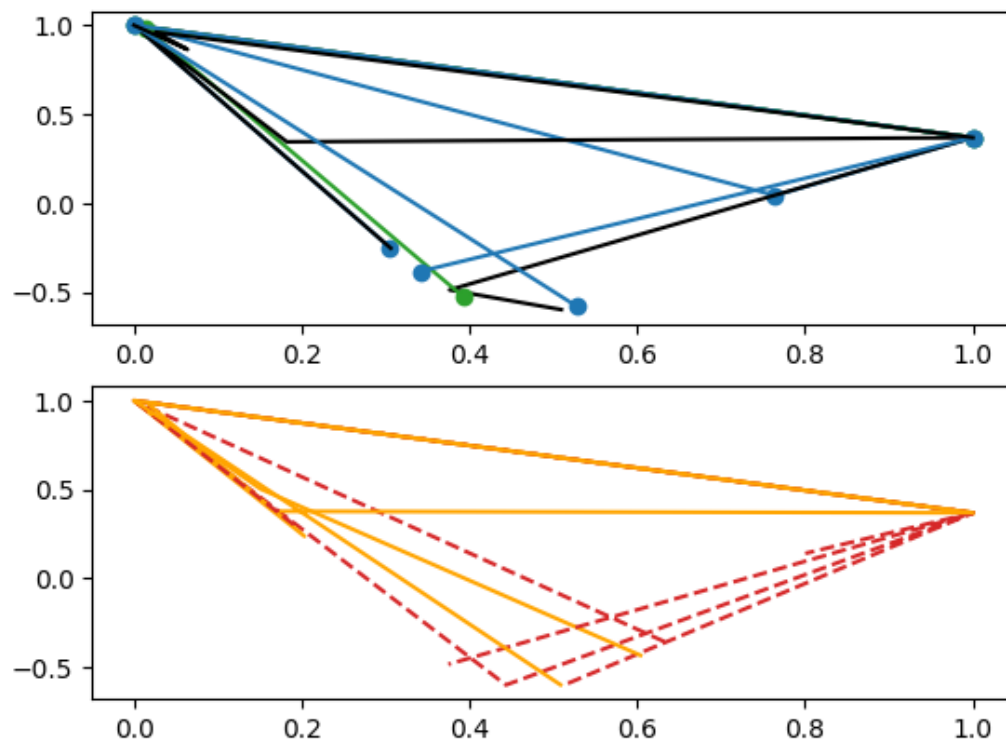


Fig 23. The normalization values.

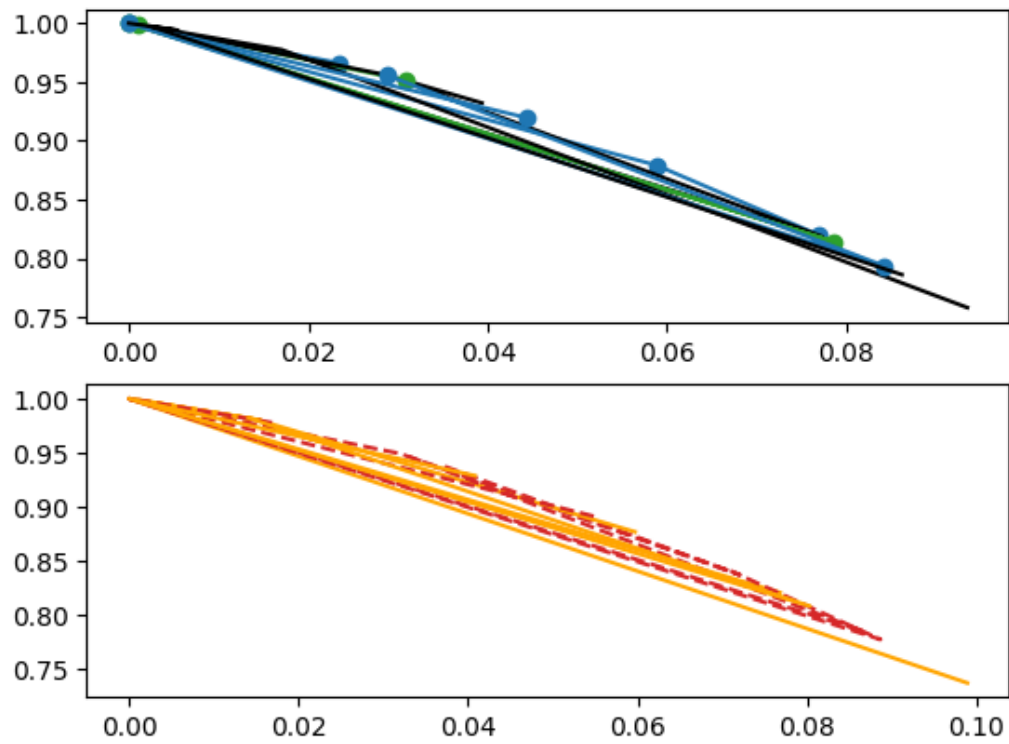


Fig 24. The power weighted matrix.

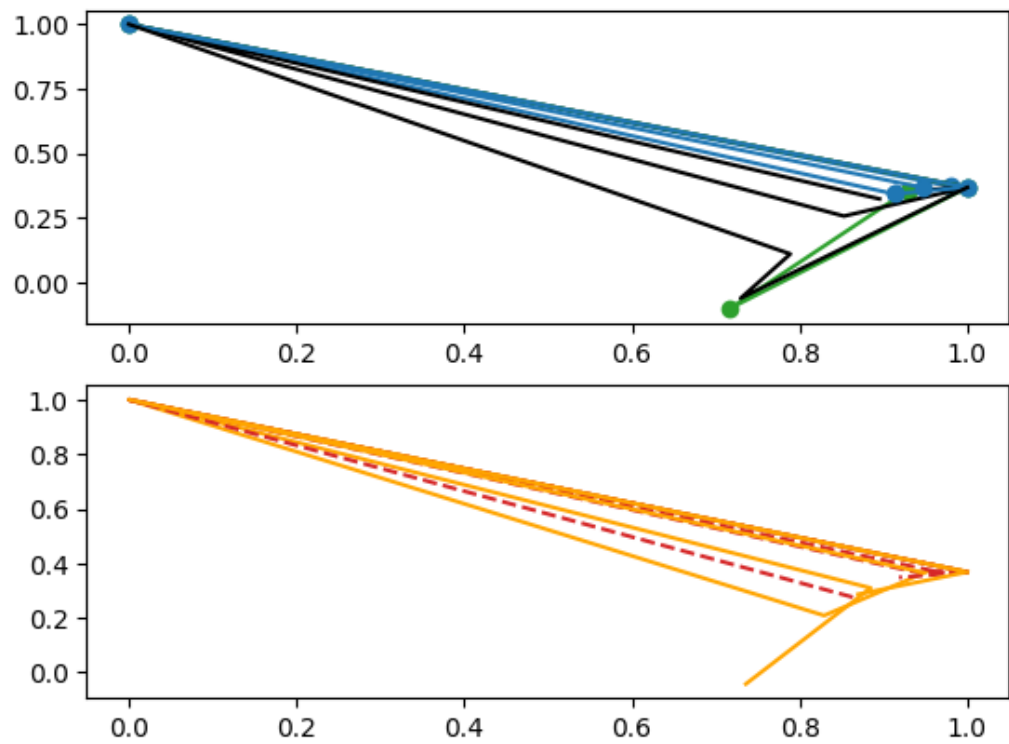


Fig 25. The total weighted matrix.

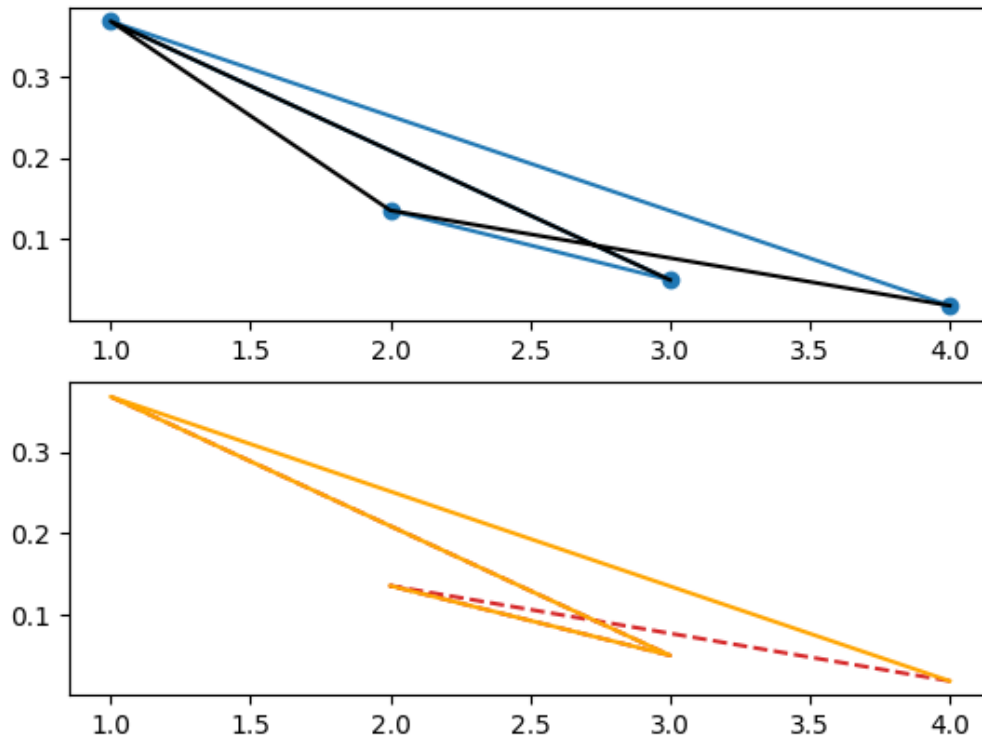


Fig 26. The final ranks.

4. Conclusions

There is no one lens that can adequately describe the effectiveness of teaching foreign literature in college programs. It calls for a well-rounded assessment mechanism that considers student growth, cultural relevance, and academic excellence. This study emphasizes the necessity of multifaceted evaluation techniques that consider curricular efficacy, student feedback, and innovative pedagogy. Improving the instruments and frameworks for assessing educational accomplishment becomes more than just an academic priority—it becomes a cultural necessity as foreign literature continues to play a significant role in forming global citizens. We used the CoCoSo method to rank the alternatives. The Double Framed SuperHyperSoft Set is used to deal with different criteria values.

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