Correlation Coefficient under Rough Neutrosophic Set for Effectiveness Assessment of Students' Mental Health Education in Higher Education Institutions

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Abstract: The disciplines of promoting mental health and well-being and preventing mental diseases are expanding. It's unknown if treatments for mental health promotion and prevention in kids, teens, adults, and senior citizens are cost-effective. This study proposes a neutrosophic framework for Effectiveness Assessment of Mental Health Education in Higher Education Institutions. This study uses the neutrosophic set to overcome uncertainty information. This study uses the Correlation Coefficient under Rough Neutrosophic Set to obtain correlation between the criteria and alternatives. We use eight criteria and eight alternatives. We show some definitions of neutrosophic set and neutrosophic rough set. The results show alternative 2 is the best and alternative 3 is the worst.

Keywords: Neutrosophic Set; Rough Set; Correlation Coefficient; Mental Health Education; Higher Education Institutions.

1. Introduction

To address ambiguity, inconsistency, incompleteness, and indeterminacy, Smarandache developed the ideas of neutrosophic sets and neutrosophic logic in 1998. To address practical challenges, Smarandache and Wang et al. (2010) investigated single valued neutrosophic sets (SVNS), a subclass of neutrosophic sets. SVNSs have been extensively researched and used in a variety of disciplines[1], [2].

A recent development in operational research is the study of decision-making in harsh neutrosophic environments. Mondal and Pramanik created a new multi attribute decision-making (MADM) technique based on grey relational analysis and proposed an accumulating geometric operator to convert a rough neutrosophic number (neutrosophic pair) to a single-valued neutrosophic number in a rough neutrosophic environment[3].

An essential tool for evaluating the relationship between two items is correlation coefficient. The correlation coefficients have been used extensively in decision-making, pattern recognition, data analysis, and categorization, among other applications. In fuzzy settings, correlation coefficients are of interest to many academics[4], [5].

1.1 Literature Review

Identifying the effectiveness of treatments, highlighting gaps in the evidence base for future research, and synthesizing the current information on interventions to promote the mental health and wellbeing of college and university students were the three goals of the review of reviews. To find English-language evaluations from high-income OECD nations published between 1999 and 2020, electronic database searches were used. All review-level empirical research included was research that looked at treatments to enhance general mental health and wellbeing among post-secondary students enrolled in universities or colleges of higher education. A modified version of the AMSTAR 2 tool was used to critically evaluate the articles. The included reviews' evidence was arranged by kind of intervention and narratively synthesized[6].

An overview of PGR mental health and wellness, as well as the major elements impacting it, can be found in a substantial, yet modest, body of literature. However, not much has been written on PGR interventions, practices, and institutional support improvements, their effects on wellbeing, or the elements that contribute to their effectiveness. The research that has assessed treatments or institutional modifications meant to promote PGR mental health and wellbeing is compiled and synthesized in this document. 21 publications that assessed treatments or practices to promote PGR welfare were found using a fast systematic review technique. Watson et al. [7] collected data from 1066 students, 33 staff members (mostly supervisors), and 11 recent graduates. The selected studies were varied but few, therefore they did not provide compelling proof of the efficacy of certain strategies.

Millions of pupils have been impacted by the shutdown of educational facilities due to the COVID-19 epidemic. Due to this, in-person instruction has had to give way to remote learning, and several emergency educational methods, including online testing, have been implemented. Montenegro-Rueda et al. [8] provided a comprehensive analysis of the research on the effects of assessment in post-pandemic higher education. The study, which included 13 papers chosen from a total of 51, was conducted using the methods outlined in the PRISMA declaration. According to the findings, both faculty and students have encountered many difficulties while adjusting to virtual settings. The primary issue for the faculty is a lack of training in online assessment methods, while the main issue for the students is dishonesty and misbehavior.

2. Preliminaries

This part shows the definitions of neutrosophic sets[3].

Definition 2.1

Neutrosophic set is characterized by truth membership function, indeterminacy membership function, and falsity membership function.

$$0 \leq T + I + F \leq 3^{+}$$

The lower and upper approximations are defined as:

$$\underline{X(Y)} = \left(T_{\underline{X(Y)}}(Z), I_{\underline{X(Y)}}(Z), F_{\underline{X(Y)}}(Z)\right)$$

$$\overline{X(Y)} = \left(T_{\overline{X(Y)}}(Z), I_{\overline{X(Y)}}(Z), F_{\overline{X(Y)}}(Z)\right)$$

$$0 \leq T_{\underline{X(Y)}}(Z) + I_{\underline{X(Y)}}(Z) + F_{\underline{X(Y)}}(Z) \leq 3$$

$$0 \leq T_{\overline{X(Y)}}(Z) + I_{\overline{X(Y)}}(Z) + F_{\overline{X(Y)}}(Z) \leq 3$$

The pair $(\underline{X(Y)}, \overline{X(Y)})$ is called rough neutrosophic set (RNS).

3. Correlation coefficient of rough neutrosophic sets (CCRNS)

CCRNS is defined in this part with operations.

Definition 3.1

Let two RNS such as:

$$X = \left(\underline{T_X(Z)}, \underline{I_X(Z)}, \underline{F_X(Z)}\right), \left(\overline{T_X(Z)}, \overline{I_X(Z)}, \overline{F_X(Z)}\right)$$

$$Y = \left(\underline{T_Y(Z)}, \underline{I_Y(Z)}, \underline{F_Y(Z)}\right), \left(\overline{T_Y(Z)}, \overline{I_Y(Z)}, \overline{F_Y(Z)}\right)$$

The correlation between X and Y is defined as:

$$C(X,Y) = \sum_{i=1}^{n} \begin{bmatrix} \Psi \mathrm{T_X}(Z) \Psi \mathrm{T_Y}(Z) + \\ \Psi \mathrm{I_X}(Z) \Psi \mathrm{I_Y}(Z) + \\ \Psi \mathrm{F_X}(Z) \Psi \mathrm{F_Y}(Z) \end{bmatrix}$$

$$\Psi \mathrm{T_X}(Z) = \frac{\underline{T_X(Z)} + \overline{T_X(Z)}}{2}$$

$$\Psi \mathrm{I_X}(Z) = \frac{\underline{I_X(Z)} + \overline{I_X(Z)}}{2}$$

$$\Psi \mathrm{F_X}(Z) = \frac{\underline{F_X(Z)} + \overline{F_X(Z)}}{2}$$

$$\Psi \mathrm{T_Y}(Z) = \frac{\underline{T_Y(Z)} + \overline{T_Y(Z)}}{2}$$

$$\Psi \mathrm{I_Y}(Z) = \frac{\underline{I_Y(Z)} + \overline{I_Y(Z)}}{2}$$

$$\Psi \mathrm{F_Y}(Z) = \frac{\underline{F_Y(Z)} + \overline{F_Y(Z)}}{2}$$

The correlation coefficient between X and Y is defined as:

$$H(X,Y)=\frac{C(X,Y)}{[C(X,X),C(Y,Y)]^{0.5}}$$

$$=\frac{\sum_{i=1}^{n}\begin{bmatrix}\Psi T_X(Z)\Psi T_Y(Z)+\\ \Psi I_X(Z)\Psi I_Y(Z)+\\ \Psi F_X(Z)\Psi F_Y(Z)\end{bmatrix}}{\left(\sum_{i=1}^{n}\begin{bmatrix}(\Psi T_X(Z))^2+\\ (\Psi I_X(Z))^2+\\ (\Psi F_X(Z))^2\end{bmatrix}^{0.5}\right)\left(\sum_{i=1}^{n}\begin{bmatrix}(\Psi T_Y(Z))^2+\\ (\Psi I_Y(Z))^2+\\ (\Psi F_Y(Z))^2\end{bmatrix}^{0.5}\right)}$$

$$H(X,Y)=H(Y,X)$$

$$0\le H(X,Y)\le 1$$

$$H(X,Y)=1, if\ X=Y$$

The cosine similarity of X and Y is defined as:

$$H(X,Y)=\frac{\begin{bmatrix}\Psi T_X(Z)\Psi T_Y(Z)+\\ \Psi I_X(Z)\Psi I_Y(Z)+\\ \Psi F_X(Z)\Psi F_Y(Z)\end{bmatrix}}{\begin{pmatrix}(\Psi T_X(Z))^2+\\ (\Psi I_X(Z))^2+\\ (\Psi F_X(Z))^2\end{pmatrix}^{0.5}\begin{pmatrix}(\Psi T_Y(Z))^2+\\ (\Psi I_Y(Z))^2+\\ (\Psi F_Y(Z))^2\end{pmatrix}^{0.5}}$$

The weighted correlation coefficient of X and Y is defined as:

$$H_W(X,Y)=\frac{\sum_{i=1}^{n}W\begin{bmatrix}\Psi T_X(Z)\Psi T_Y(Z)+\\ \Psi I_X(Z)\Psi I_Y(Z)+\\ \Psi F_X(Z)\Psi F_Y(Z)\end{bmatrix}}{\left(\sum_{i=1}^{n}W\begin{bmatrix}(\Psi T_X(Z))^2+\\ (\Psi I_X(Z))^2+\\ (\Psi F_X(Z))^2\end{bmatrix}^{0.5}\right)\left(\sum_{i=1}^{n}W\begin{bmatrix}(\Psi T_Y(Z))^2+\\ (\Psi I_Y(Z))^2+\\ (\Psi F_Y(Z))^2\end{bmatrix}^{0.5}\right)}$$

4. Proposed Algorithm based on Correlation Coefficient

Let set of alternatives such as: $CCCA_1, CCCA_2, \dots, CCCA_m$ and set of criteria such as: $CCCB_1, CCCB_2, \dots, CCCB_n$. The steps of the proposed method are shown such as:

Step 1. Create the relation between criteria and alternatives such as:

$$R=\begin{bmatrix}r_{11} & \cdots & r_{1n}\\ \vdots & \ddots & \vdots\\ r_{m1} & \cdots & r_{mn}\end{bmatrix}$$

Step 2. Compute the correlation between the criteria and alternatives.

Step 3. Rank the alternatives.

5. Results

This section shows the results of the proposed approach for Effectiveness Assessment of Mental Health Education in Higher Education Institutions. This study uses eight criteria and eight alternatives as shown in Table 1.

Table 1. Criteria and alternatives.

Criteria	alternatives
Curriculum Relevance	Integration of Mental Health Courses into General Curriculum
Teaching Quality	Workshops and Seminars on Stress and Anxiety Management
Accessibility of Resources	Peer Counseling and Mentorship Programs
Student Participation	Online Counseling and Support Platforms
Awareness and Knowledge Gain	Mindfulness and Meditation Training Initiatives
Behavioral and Attitudinal Change	Teacher and Staff Training in Student Mental Health Support
Support System Integration	Campus-Wide Anti-Stigma Campaigns
Sustainability and Continuity	Blended Mental Health Education Models

Table 2. shows the rough neutrosophic numbers between the criteria and alternatives.

Table 2. RNNs.

	$CCCB_1$	$CCCB_2$	$CCCB_3$	$CCCB_4$	$CCCB_5$	$CCCB_6$	$CCCB_7$	$CCCB_8$
$CCCA_1$	((.6,.4,.3),(.8,.2,.1))	((.4,.4,.4),(.6,.2,.2))	((.5,.3,.4),(.7,.3,.2))	((.6,.5,.4),(.8,.3,.2))	((.4,.3,.3),(.6,.1,.1))	((.1,.4,.6),(.3,.2,.4))	((.2,.4,.6),(.4,.4,.4))	((.5,.3,.4),(.7,.3,.2))
$CCCA_2$	((.6,.4,.3),(.8,.2,.1))	((.2,.4,.6),(.4,.4,.4))	((.1,.4,.6),(.3,.2,.4))	((.4,.3,.3),(.6,.1,.1))	((.6,.5,.4),(.8,.3,.2))	((.5,.3,.4),(.7,.3,.2))	((.6,.4,.3),(.8,.2,.1))	((.6,.5,.4),(.8,.3,.2))
$CCCA_3$	((.4,.4,.4),(.6,.2,.2))	((.5,.3,.4),(.7,.3,.2))	((.6,.5,.4),(.8,.3,.2))	((.4,.3,.3),(.6,.1,.1))	((.1,.4,.6),(.3,.2,.4))	((.4,.4,.4),(.6,.2,.2))	((.4,.4,.4),(.6,.2,.2))	((.4,.3,.3),(.6,.1,.1))
$CCCA_4$	((.6,.5,.4),(.8,.3,.2))	((.5,.3,.4),(.7,.3,.2))	((.4,.4,.4),(.6,.2,.2))	((.6,.4,.3),(.8,.2,.1))	((.2,.4,.6),(.4,.4,.4))	((.6,.4,.3),(.8,.2,.1))	((.5,.3,.4),(.7,.3,.2))	((.1,.4,.6),(.3,.2,.4))
$CCCA_5$	((.4,.3,.3),(.6,.1,.1))	((.6,.5,.4),(.8,.3,.2))	((.5,.3,.4),(.7,.3,.2))	((.4,.4,.4),(.6,.2,.2))	((.6,.4,.3),(.8,.2,.1))	((.2,.4,.6),(.4,.4,.4))	((.6,.5,.4),(.8,.3,.2))	((.2,.4,.6),(.4,.4,.4))
$CCCA_6$	((.4,.3,.3),(.6,.1,.1))	((.4,.3,.3),(.6,.1,.1))	((.6,.5,.4),(.8,.3,.2))	((.4,.3,.3),(.6,.1,.1))	((.2,.4,.6),(.4,.4,.4))	((.1,.4,.6),(.3,.2,.4))	((.4,.3,.3),(.6,.1,.1))	((.1,.4,.6),(.3,.2,.4))
$CCCA_7$	((.1,.4,.6),(.3,.2,.4))	((.2,.4,.6),(.4,.4,.4))	((.4,.4,.4),(.6,.2,.2))	((.2,.4,.6),(.4,.4,.4))	((.4,.3,.3),(.6,.1,.1))	((.6,.5,.4),(.8,.3,.2))	((.2,.4,.6),(.4,.4,.4))	((.4,.4,.4),(.6,.2,.2))
$CCCA_8$	((.2,.4,.6),(.4,.4,.4))	((.6,.4,.3),(.8,.2,.1))	((.6,.4,.3),(.8,.2,.1))	((.6,.4,.3),(.8,.2,.1))	((.6,.5,.4),(.8,.3,.2))	((.5,.3,.4),(.7,.3,.2))	((.6,.4,.3),(.8,.2,.1))	((.2,.4,.6),(.4,.4,.4))
	$CCCB_1$	$CCCB_2$	$CCCB_3$	$CCCB_4$	$CCCB_5$	$CCCB_6$	$CCCB_7$	$CCCB_8$
$CCCA_1$	((.6,.5,.4),(.8,.3,.2))	((.4,.4,.4),(.6,.2,.2))	((.5,.3,.4),(.7,.3,.2))	((.6,.5,.4),(.8,.3,.2))	((.4,.3,.3),(.6,.1,.1))	((.1,.4,.6),(.3,.2,.4))	((.2,.4,.6),(.4,.4,.4))	((.5,.3,.4),(.7,.3,.2))
$CCCA_2$	((.5,.3,.4),(.7,.3,.2))	((.2,.4,.6),(.4,.4,.4))	((.1,.4,.6),(.3,.2,.4))	((.6,.5,.4),(.8,.3,.2))	((.6,.5,.4),(.8,.3,.2))	((.5,.3,.4),(.7,.3,.2))	((.6,.5,.4),(.8,.3,.2))	((.6,.5,.4),(.8,.3,.2))

CCCA$_3$	((.4,.4,.4),(.6,.2,.2))	((.5,.3,.4),(.7,.3,.2))	((.6,.5,.4),(.8,.3,.2))	((.5,.3,.4),(.7,.3,.2))	((.6,.5,.4),(.8,.3,.2))	((.4,.4,.4),(.6,.2,.2))	((.5,.3,.4),(.7,.3,.2))	((.4,.3,.3),(.6,.1,.1))
CCCA$_4$	((.6,.4,.3),(.8,.2,.1))	((.5,.3,.4),(.7,.3,.2))	((.4,.4,.4),(.6,.2,.2))	((.4,.4,.4),(.6,.2,.2))	((.5,.3,.4),(.7,.3,.2))	((.6,.4,.3),(.8,.2,.1))	((.4,.4,.4),(.6,.2,.2))	((.1,.4,.6),(.3,.2,.4))
CCCA$_5$	((.2,.4,.6),(.4,.4,.4))	((.6,.5,.4),(.8,.3,.2))	((.5,.3,.4),(.7,.3,.2))	((.6,.4,.3),(.8,.2,.1))	((.4,.4,.4),(.6,.2,.2))	((.2,.4,.6),(.4,.4,.4))	((.6,.4,.3),(.8,.2,.1))	((.4,.3,.3),(.6,.1,.1))
CCCA$_6$	((.6,.5,.4),(.8,.3,.2))	((.6,.5,.4),(.8,.3,.2))	((.6,.5,.4),(.8,.3,.2))	((.2,.4,.6),(.4,.4,.4))	((.6,.4,.3),(.8,.2,.1))	((.6,.5,.4),(.8,.3,.2))	((.2,.4,.6),(.4,.4,.4))	((.1,.4,.6),(.3,.2,.4))
CCCA$_7$	((.2,.4,.6),(.4,.4,.4))	((.4,.4,.4),(.6,.2,.2))	((.2,.4,.6),(.4,.4,.4))	((.4,.4,.4),(.6,.2,.2))	((.5,.3,.4),(.7,.3,.2))	((.4,.4,.4),(.6,.2,.2))	((.4,.4,.4),(.6,.2,.2))	((.5,.3,.4),(.7,.3,.2))
CCCA$_8$	((.4,.4,.4),(.6,.2,.2))	((.4,.4,.4),(.6,.2,.2))	((.4,.4,.4),(.6,.2,.2))	((.4,.3,.3),(.6,.1,.1))	((.5,.3,.4),(.7,.3,.2))	((.4,.4,.4),(.6,.2,.2))	((.4,.3,.3),(.6,.1,.1))	((.4,.3,.3),(.6,.1,.1))
	CCCB$_1$	CCCB$_2$	CCCB$_3$	CCCB$_4$	CCCB$_5$	CCCB$_6$	CCCB$_7$	CCCB$_8$
CCCA$_1$	((.6,.4,.3),(.8,.2,.1))	((.4,.4,.4),(.6,.2,.2))	((.5,.3,.4),(.7,.3,.2))	((.6,.5,.4),(.8,.3,.2))	((.4,.3,.3),(.6,.1,.1))	((.1,.4,.6),(.3,.2,.4))	((.2,.4,.6),(.4,.4,.4))	((.5,.3,.4),(.7,.3,.2))
CCCA$_2$	((.2,.4,.6),(.4,.4,.4))	((.2,.4,.6),(.4,.4,.4))	((.1,.4,.6),(.3,.2,.4))	((.4,.3,.3),(.6,.1,.1))	((.6,.5,.4),(.8,.3,.2))	((.5,.3,.4),(.7,.3,.2))	((.6,.4,.3),(.8,.2,.1))	((.6,.5,.4),(.8,.3,.2))
CCCA$_3$	((.1,.4,.6),(.3,.2,.4))	((.6,.4,.3),(.8,.2,.1))	((.6,.5,.4),(.8,.3,.2))	((.4,.3,.3),(.6,.1,.1))	((.1,.4,.6),(.3,.2,.4))	((.4,.4,.4),(.6,.2,.2))	((.2,.4,.6),(.4,.4,.4))	((.4,.3,.3),(.6,.1,.1))
CCCA$_4$	((.4,.3,.3),(.6,.1,.1))	((.2,.4,.6),(.4,.4,.4))	((.6,.4,.3),(.8,.2,.1))	((.6,.4,.3),(.8,.2,.1))	((.6,.4,.3),(.8,.2,.1))	((.6,.4,.3),(.8,.2,.1))	((.1,.4,.6),(.3,.2,.4))	((.1,.4,.6),(.3,.2,.4))
CCCA$_5$	((.6,.5,.4),(.8,.3,.2))	((.1,.4,.6),(.3,.2,.4))	((.2,.4,.6),(.4,.4,.4))	((.6,.4,.3),(.8,.2,.1))	((.2,.4,.6),(.4,.4,.4))	((.6,.4,.3),(.8,.2,.1))	((.4,.3,.3),(.6,.1,.1))	((.2,.4,.6),(.4,.4,.4))
CCCA$_6$	((.5,.3,.4),(.7,.3,.2))	((.4,.3,.3),(.6,.1,.1))	((.1,.4,.6),(.3,.2,.4))	((.2,.4,.6),(.4,.4,.4))	((.1,.4,.6),(.3,.2,.4))	((.2,.4,.6),(.4,.4,.4))	((.6,.5,.4),(.8,.3,.2))	((.1,.4,.6),(.3,.2,.4))
CCCA$_7$	((.6,.4,.3),(.8,.2,.1))	((.6,.4,.3),(.8,.2,.1))	((.6,.4,.3),(.8,.2,.1))	((.6,.4,.3),(.8,.2,.1))	((.4,.4,.4),(.6,.2,.2))	((.6,.4,.3),(.8,.2,.1))	((.4,.4,.4),(.6,.2,.2))	((.6,.4,.3),(.8,.2,.1))
CCCA$_8$	((.2,.4,.6),(.4,.4,.4))	((.2,.4,.6),(.4,.4,.4))	((.2,.4,.6),(.4,.4,.4))	((.4,.4,.4),(.6,.2,.2))	((.6,.4,.3),(.8,.2,.1))	((.2,.4,.6),(.4,.4,.4))	((.6,.4,.3),(.8,.2,.1))	((.4,.4,.4),(.6,.2,.2))

We use the RNNs, to combine it into a single matrix as shown in Figures 1-8. The findings of this study not only provide a rigorous mathematical model but also carry important practical implications for higher education institutions. By ranking the alternatives through the correlation coefficient under a rough neutrosophic environment, administrators can identify which strategies are most effective for supporting student mental health and well-being. For example, the results may guide universities in prioritizing the integration of mental health courses into curricula, expanding staff training programs, or enhancing campus-wide support initiatives. Compared with previous approaches, this framework adds value by explicitly addressing uncertainty and indeterminacy, thereby offering a more robust tool for decision-making. Furthermore, the study highlights opportunities for both policy and research: policymakers can design targeted, evidence-based interventions, while future researchers may extend the model to broader datasets or different institutional contexts. In this way, the proposed framework not only contributes theoretically but also serves as a practical foundation for improving mental health education in higher education.

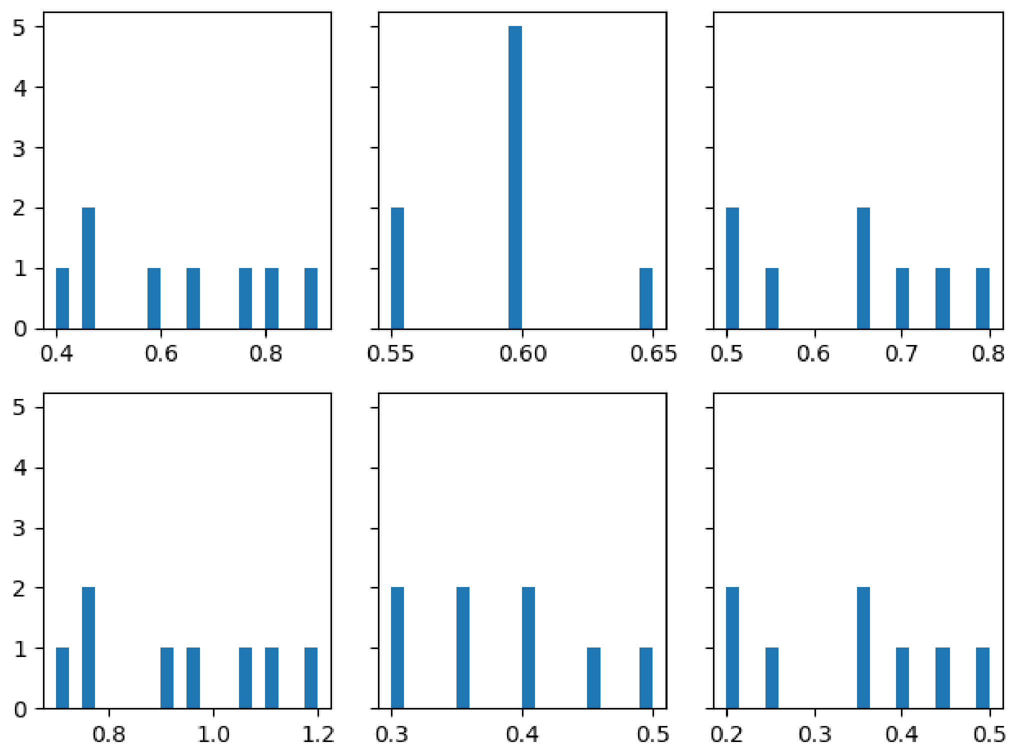

Figure 1. Values based on CCB1.

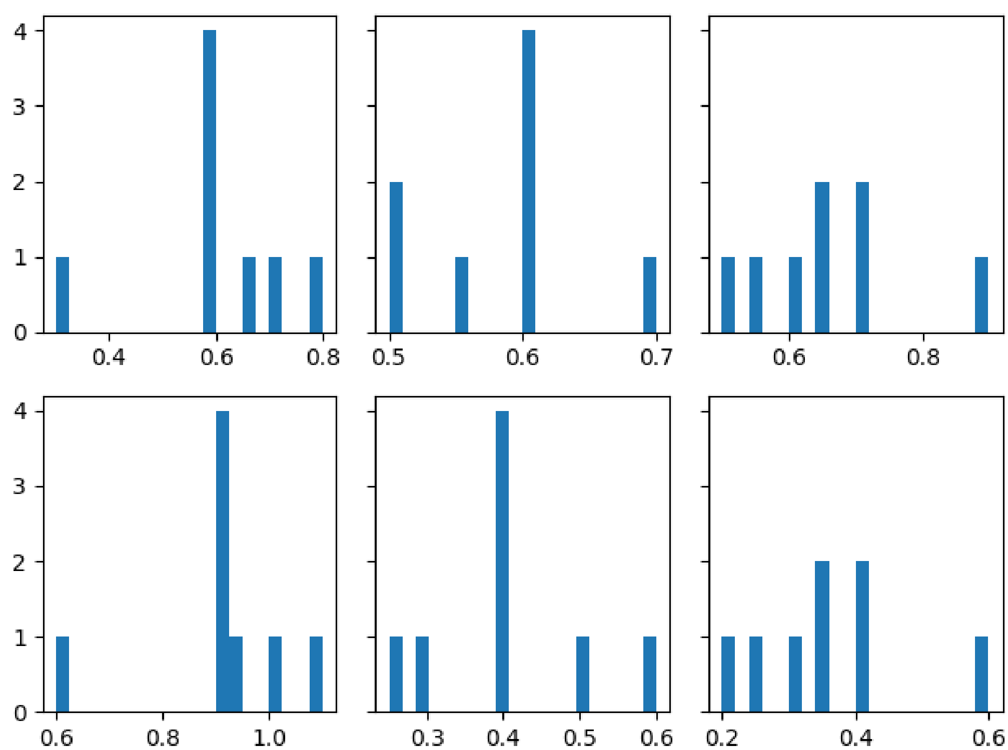

Figure 2. Values based on CCB2.

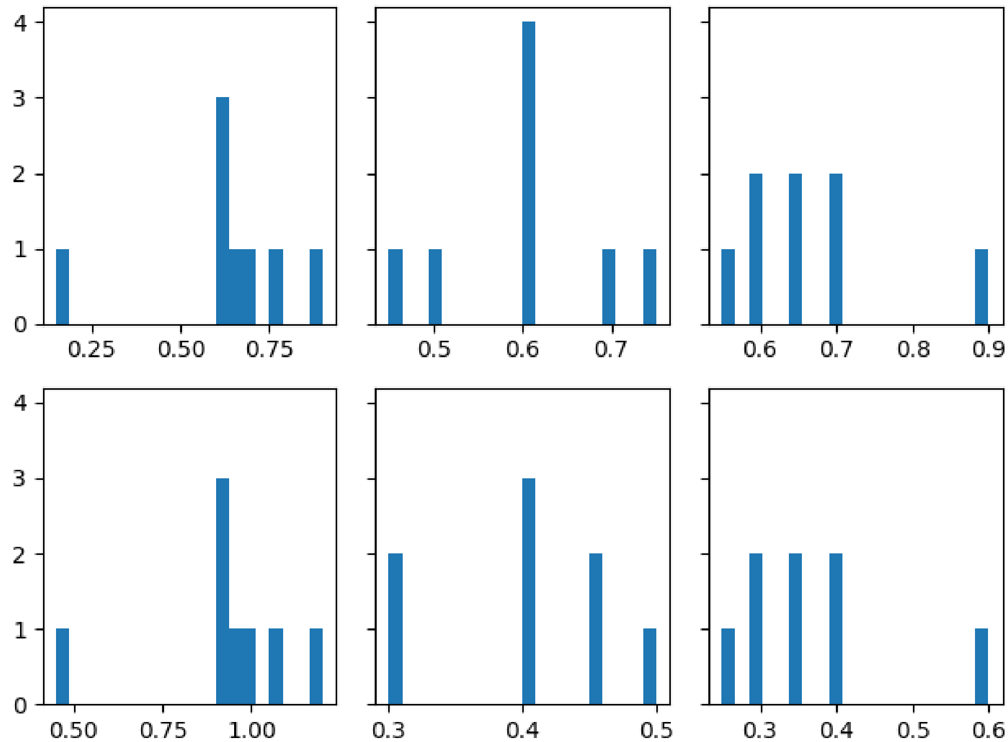

Figure 3. Values based on CCB3.

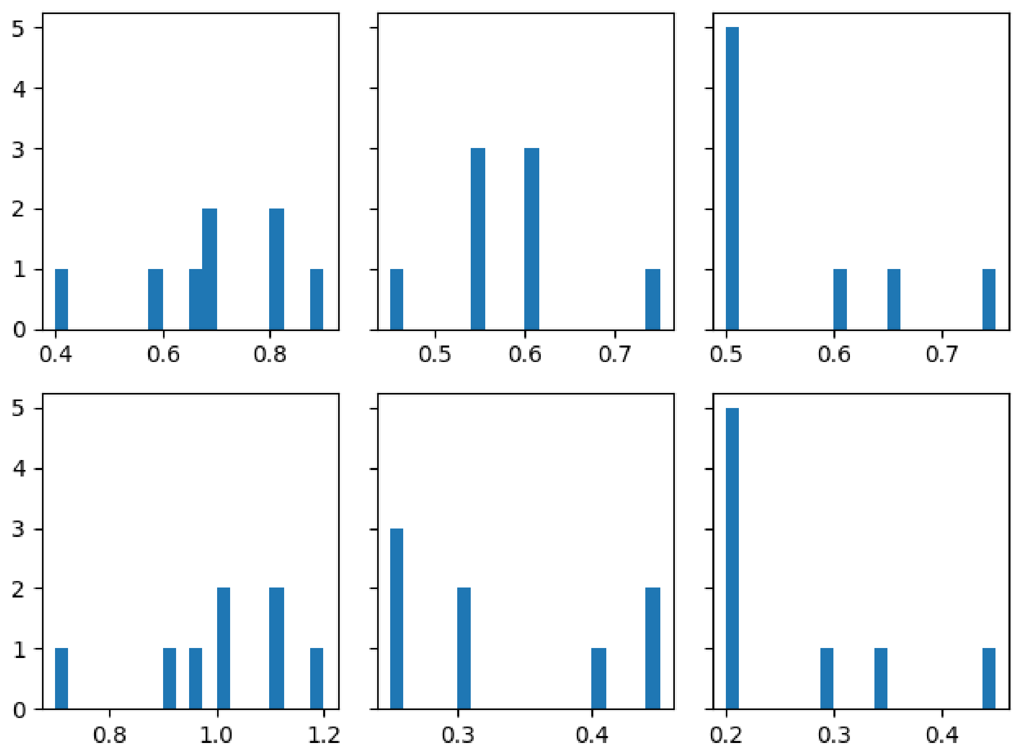

Figure 4. Values based on CCB4.

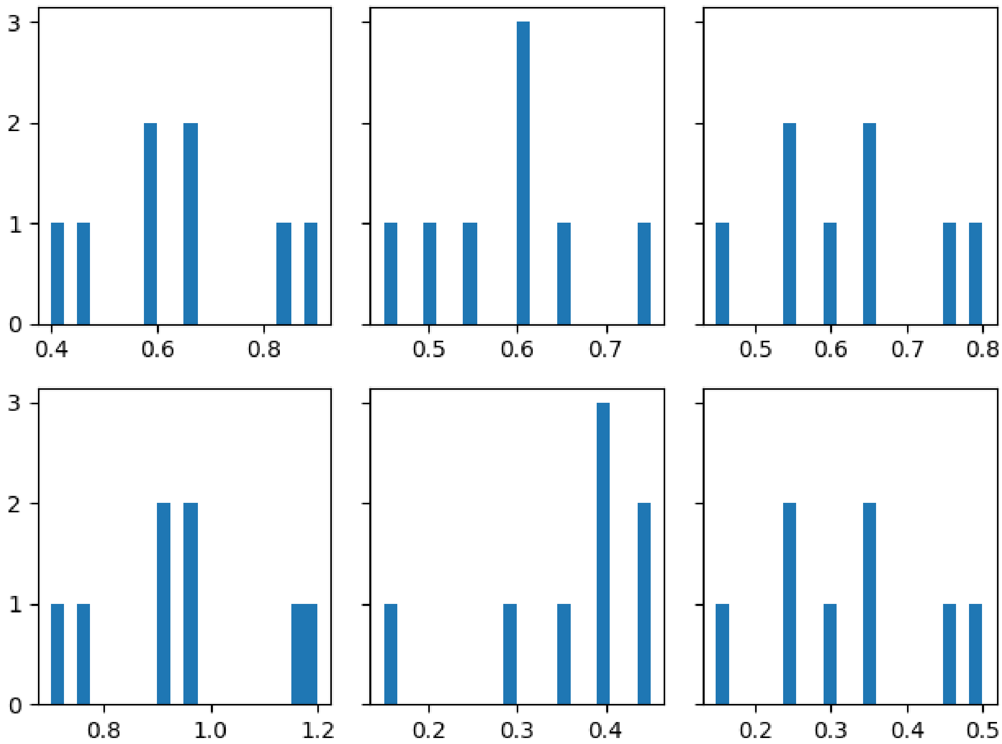

Figure 5. Values based on CCB5.

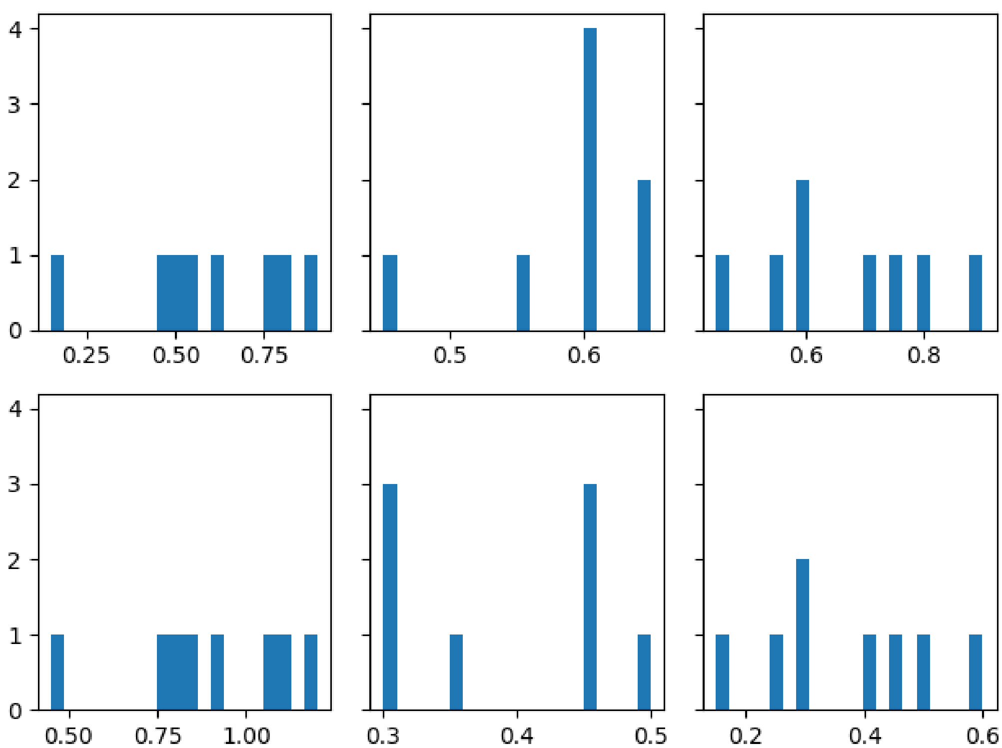

Figure 6. Values based on CCB6.

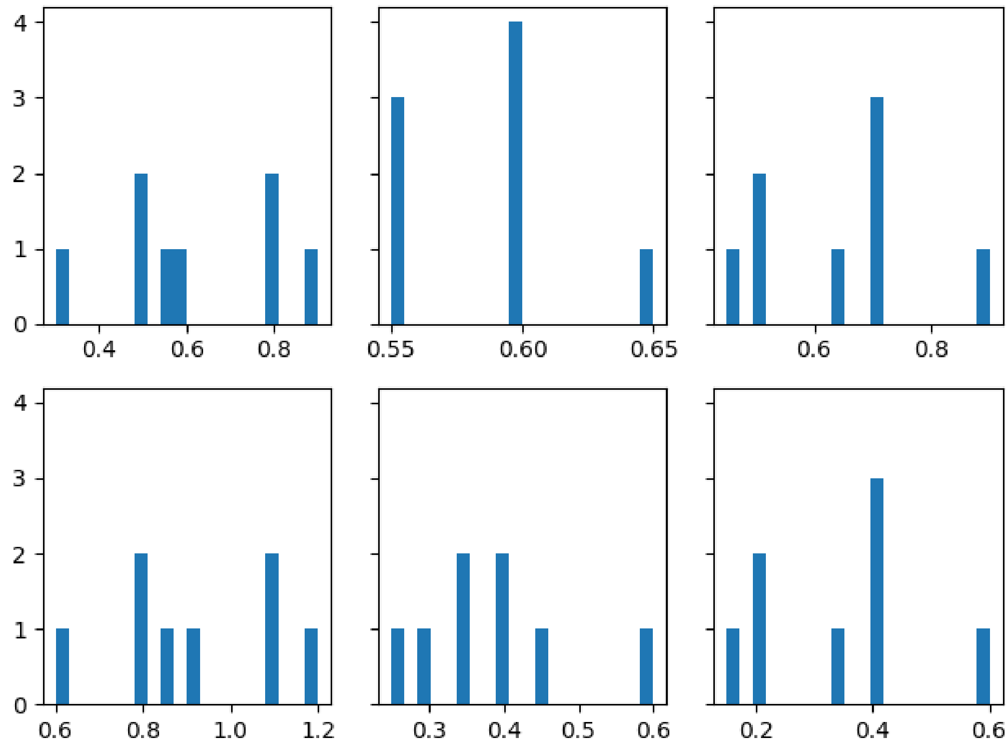

Figure 7. Values based on CCB7.

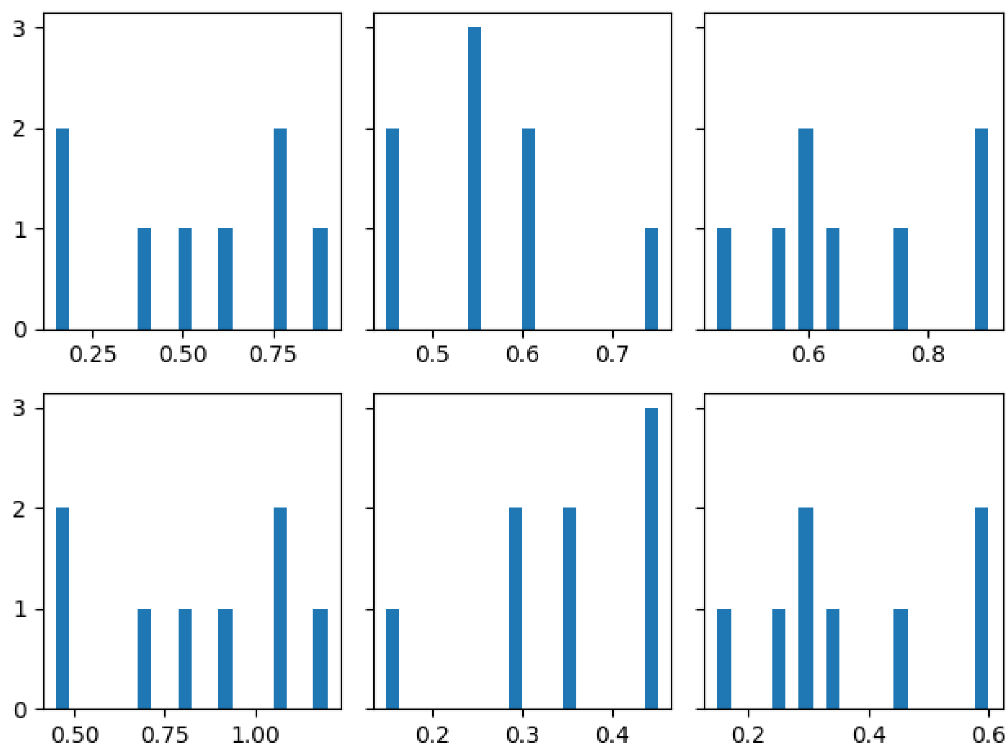

Figure 8. Values based on CCB8.

The correlation coefficient is used to obtain between the criteria and alternatives. Then the correlation coefficient is ranked as shown in Figure 9.

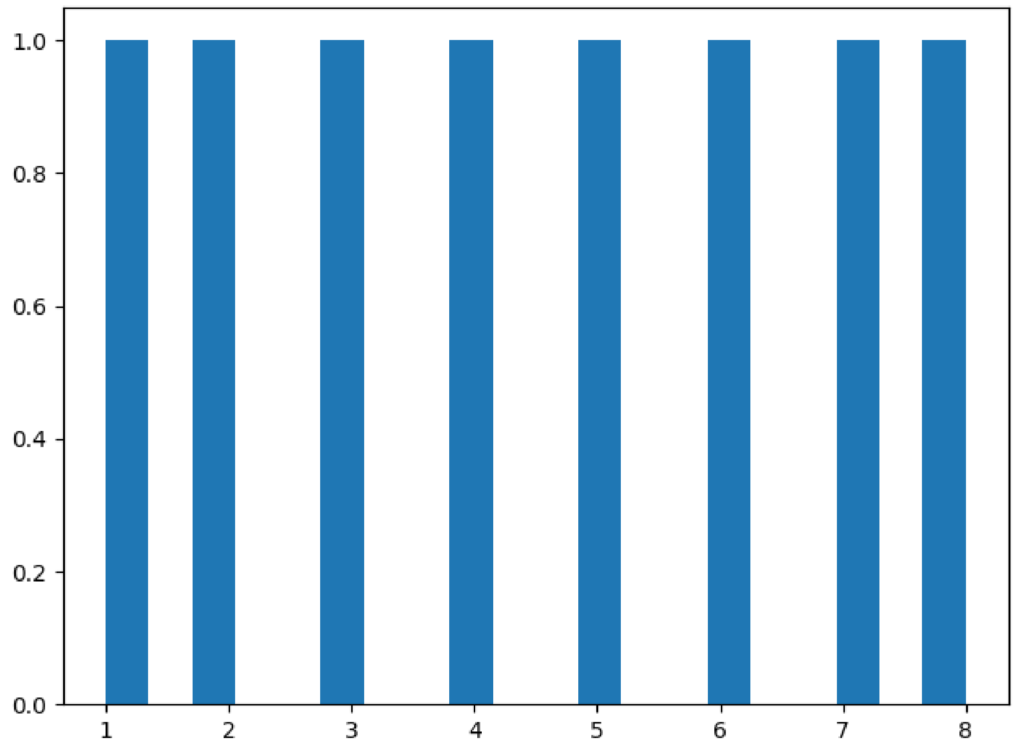

Figure 9. Rank of alternatives.

This study provides a robust framework that addresses uncertainty in evaluating mental health education programs in higher education. By ranking alternatives through the rough neutrosophic correlation coefficient, the findings offer practical guidance for universities and policymakers in designing effective, evidence-based interventions. Beyond its theoretical contribution, the model serves as a foundation for future research and broader applications across diverse educational contexts.

6. Conclusions

Given the physiological, social, and economic costs associated with mental illnesses, the gradually rising frequency of mental disorders in children and adolescents is a public health concern. The burden of mental disorders may be lessened by school-based interventions that increase mental health literacy and lessen stigma around mental health. Such events may also prevent mental illnesses and encourage mental wellness. This study used the neutrosophic set to overcome uncertainty information. We used the Correlation Coefficient under Rough Neutrosophic Set to show the correlation between the alternatives and criteria. 8 criteria and 8 alternatives are used in this study. The alternatives are ranked based on the largest value in the correlation coefficient between the criteria and alternatives.

References

[1] F. Smarandache, "Introduction to Neutrosophy, Neutrosophic Set, Neutrosophic Probability, Neutrosophic Statistics and Their Applications to Decision Making," in *Neutrosophic Paradigms: Advancements in Decision Making and Statistical Analysis: Neutrosophic Principles for Handling Uncertainty*, Springer, 2025, pp. 3–21.

[2] F. Smarandache, *Neutrosophic Overset, Neutrosophic Underset, and Neutrosophic Offset. Similarly for Neutrosophic Over-/Under-/Off-Logic, Probability, and Statistics*. Infinite Study, 2016.

[3] S. Pramanik, R. Roy, T. K. Roy, and F. Smarandache, *Multi criteria decision making using correlation coefficient under rough neutrosophic environment*. Infinite Study, 2017.

[4] S. Broumi and F. Smarandache, "Correlation coefficient of interval neutrosophic set," *Appl. Mech. Mater.*, vol. 436, pp. 511–517, 2013.

[5] I. M. Hanafy, A. A. Salama, and K. Mahfouz, "Correlation of neutrosophic Data," *Int. Ref. J. Eng. Sci.*, vol. 1, no. 2, pp. 39–43, 2012.

[6] J. D. Worsley, A. Pennington, and R. Corcoran, "Supporting mental health and wellbeing of university and college students: A systematic review of review-level evidence of interventions," *PLoS One*, vol. 17, no. 7, p. e0266725, 2022.

[7] D. Watson and J. Turnpenny, "Interventions, practices and institutional arrangements for supporting PGR mental health and wellbeing: reviewing effectiveness and addressing barriers," *Stud. High. Educ.*, vol. 47, no. 9, pp. 1957–1979, 2022.

[8] M. Montenegro-Rueda, A. Luque-de la Rosa, J. L. Sarasola Sánchez-Serrano, and J. Fernández-Cerero, "Assessment in higher education during the COVID-19 pandemic: A systematic review," *Sustainability*, vol. 13, no. 19, p. 10509, 2021.

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