A Nonagonal Single-Valued Neutrosophic Soft Set Analysis of Issues Faced by Female Employees across Industries

John Jayaraj J.[1], N. Jose Parvin Praveena[2], I. Paulraj Jayasimman[3,*], Broumi said[4, 5]

[1]Department of Mathematics, AMET University Chennai, Tamil Nadu, India
[2]Department of Mathematics , St. Joseph's College of Engineering, Chennai-600119, India
[3]Department of Mathematics, AMET University Chennai, Tamil Nadu, India
[4]Department of Mathematics SIMATS Engineering, Saveetha Institute of Medical and Technical Sciences, Thandalam Chennai, Tamilnadu , India
[5]Laboratory of Information Processing, Faculty of Science Ben M'Sik, University of Hassan II, Casablanca, Morocco

Emails: johnjayaraj0@gmail.com; jose30102003@gmail.com; ipjayasimman@ametuniv.ac.in; broumisaid78@gmail.com

Abstract

This paper presents a novel approach for ranking the issues experienced by female employees across various industries using the nonagonal single-valued neutrosophic soft set framework. By leveraging an extensive database of multi-observer data, we evaluated the challenges faced by women in diverse work environments. The Neutrosophic Soft Set proved to be a robust tool for addressing decision-making complexities within the neutrosophic domain, facilitating a comprehensive understanding of these issues. We established a comparative table to categorize the identified problems, enabling effective organization based on attributes, capabilities, and outcomes. Our findings underscore the utility of advanced mathematical frameworks in analyzing gender-specific workplace challenges, providing valuable insights for developing targeted interventions. This research contributes to the ongoing discourse on gender equity in the workplace and lays the groundwork for future studies aimed at enhancing the experiences of female employees across sectors.

Keywords: Nonagonal Neutrosophic soft sets; Score function; Progressive table; Issues of women; Variable sense

1. Introduction

Although there are many instances requiring uncertain data, which may be treated with classical mathematical concepts, it may be challenging to define and use the concept of uncertainty. Numerous techniques, including probability theory, neutrosophic set theory and ambiguous set theory can be employed to describe these domains. The soft set notion, a novel computing methodology introduced by Molodtsov [15] in 1999, is helpful in managing uncertainty. The earlier notion that unclear and indeterminate sets were not properly suited for handling unclear qualities was the main driving force behind the creation of this methodology. Though intuitionistic fuzzy sets may manage inaccurate and ambiguous data, they are incapable of managing inaccurate information. Neutronosophic sets, nevertheless, can handle this type of data as every parameter is unique and its ambiguity is clearly stated. Furthermore, Maji initially suggested a technique that eliminated the different challenges associated with putting this concept into practice because neutrosophic sets have the capacity to handle such varieties of information Additionally, considering neutrosophic structures can manage such types of information, Maji first proposed a method that removed the various difficulties related to implementing this idea [9]. Neutrosophic soft sets have

DOI: https://doi.org/10.54216/IJNS.260316

initially applied to problems concerning decision-making. Although neutrosophic sets require an overview for every operator and set to be able to be employed in practical scenarios, they can accept a large range of kinds of data. In order to deal with uncertainty in intricate choice making, the neutrosophic soft set developed. Mumtaz Ali [1] developed a decision-making system based on bipolar neutrosophic soft sets. A brief description of the various processes for the bipolar neutrosophic soft sets and their viability is given in this work. Irfan Deli proposed a novel solution that addressed the interval-valued neutrosophic soft sets problem in a separate investigation [2]. Several of the characteristics of the various sets are analyzed. Broumi then presented the concept of enlarged neutrosophic soft sets. On this notion, specific characteristics and operations are determined [3]. Utilizing Wang's single-valued neutrosophic covering rough sets, a novel kind of single-valued neutrosophic (SVN) cover-based rough sets spanning the two realms is suggested. While the suggested approach depends on several realms of existence, Wang's paradigm is dependent on just one; hence, the novel approach offers a fresh viewpoint for selecting options in ambiguous situations [4]. The author presented the basic ideas of neutrosophic soft p-open sets and neutrosophic soft p-closed sets, together with an overview of their key attributes. Furthermore, in neutrosophic soft topological areas, the concepts of neutrosophic soft p-neighborhood and neutrosophic soft p-separation principles are created. Significant findings are examined in relation to the recently developed concepts of soft regions [5]. A novel method for choosing a mobile phone in an MCDM making choices atmosphere is put forth. First, a suggested technique uses extended fuzzy TOPSIS (GFT) to deal with the issue that is initially referred to as a neutrosophic soft set [6]. In this paper, the group replacement model is solved using a special, single-valued octagonal Neutrosophic number. The formula for the de-neutrosophication of the octagonal neutrosophic number is deduced by using the area removal method [8]. In problem solving, an extended Neutrosophic soft set is utilized. M. Irfan Ali et al introduced some new concepts including restricted intersection, restricted union, restricted difference and extended intersection of two soft sets [10]. Shuker Mahmood [11] developed the idea of the differentially inaccurate soft point. In this paper, Kandil A defined and studied regularity and separation axioms in fuzzy soft topological spaces with the help of fuzzy soft neighborhood system and quasi-coincident relation [12]. PK Maji proposed Complement, union, intersection, AND, and OR and studied some properties of these operations [13].

2. Preliminaries

Definition 2.1: Within the discourse context Z, neutrosophic set D is described as $D = \{(z, T_D(z), I_D(z), F_D(z))/z \in Z\}$ where $T_D, I_D, F_D : Z \to [0,1^+]$

And $0^- \leq T_D(z) + I_D(z) + F_D(z) \leq 3^+$

Definition 2.2: We will now look at a non-empty set $T, T \subseteq V$, a collections (T, V) is known as a soft set on Z, with 'T' being the mapping provided by $T: V \to P(z)$

Definition 2.3: A collection graded expression through T to P(Z) is called a soft set T on Z. A collection of sequential pairs could be created with it.

$V = \{z, V(z)/ \ z \in Z\}$

The component (t, V(t)) does not occur within V when V(t)=∅.

Definition 2.4: Z should be a entire collection. Let S be an array of variables. Let $R \subset S$. Let P(Z) be the set comprising all sets related to Z that are Neutrosophic. A representation of S:R→P(Z) is used to identify the set (S, R) as the soft Neutrosophic sets on Z.

Definition 2.5: Consider (X, G) & (Y, H) are two single-valued soft sets on the entire realm that are Neutrosophic, then joint of (X, G) & (Y, H) this is decided through (X, G)∩(Y, H) = (N, O) where O = $G \cap$ H as well as the memberships in falsity, indeterminacy, and truth of (N, O) are as follows

$$T_{N(c)}(n) = \min\{T_{X(c)}(n), T_{Y(c)}(n)\} \quad if \quad c \in G \cap H$$

$$I_{N(c)}(n) = \min\{I_{X(c)}(n), I_{Y(c)}(n)\} \quad if \quad c \in G \cap H$$

$$F_{N(c)}(n) = \max\{F_{X(c)}(n), F_{Y(c)}(n)\} \quad if \quad c \in G \cap H$$

Definition 2.6: consider (X,G) & (Y,H) in the ordinary universe Y, there are two single-valued Neutrosophic soft sets. The union of these (X, G) & (Y, H) is expressed by

(X, G)∪(Y, H) = (N, O) where O = $G \cup$ H as well as the following are (N,O)'s the truth, ambiguity and untruth membership:

$$T_{N(c)}(m) = \max\{T_{X(c)}(n), T_{Y(c)}(n)\} \quad if \quad c \in G \cup H$$

DOI: https://doi.org/10.54216/IJNS.260316

$$I_{N(c)}(m) = \max\{I_{X(c)}(n), I_{Y(c)}(n)\} \quad if \quad c \in G \cup H$$

$$F_{N(c)}(m) = \min\{F_{X(c)}(n), F_{Y(c)}(n)\} \quad if \quad c \in G \cup H$$

Definition 2.7: The score function of single-valued Neutrosophic number is provided by

$$T(\widehat{NS}) = \frac{1 + T_{\widehat{NS}} - 2I_{\widehat{NS}} - F_{\widehat{NS}}}{2}$$

Where $T_{\widehat{NS}}$ = Truth membership function

$I_{\widehat{NS}} = Indeterminacy\ \ membership\ \ function$

$F_{\widehat{NS}}$ =falsity membership function

Definition 2.8: The score function formula for Special single valued Nonagonal Neutrosophic number is provided by

Let $\tilde{B}$ = (j, k, l, m, n, o, p, q, r; $\rho_{T,}\ \in_{I,}\ \ \sigma_F$)

Let $\gamma_{neu} = (j + 2k + 2l + m + o + 2p + 2q + r)$

$\vartheta_{neu} = (l + 2m + n)$

$$\tilde{B} = \frac{\gamma_{neu}(\rho_T)+\vartheta_{neu}(1-\rho_T)+\gamma_{neu}(1-\in_{I,})+\vartheta_{neu}(\in_{I,})+\gamma_{neu}(1-\sigma_F)+\ \vartheta_{neu}(\sigma_F))}{28}$$

3. Utilization of Single valued Neutrosophic soft set-in decision-making problem to analyse the problems of women working in industries.

Consider $W = \{w_1, w_2, w_3, w_4, w_5, w_6\}$ be the set of women working in industries having different problems like behavioural problem, physical problem, psychological problem.

The parameter set $H =$ {Anorexia, Alcoholism, under performance, Changes in close family relationships, Sore Head, Angina Pectoris, Muscle Soreness, Recurrent illness, Hypertension, Tetchiness, Sorrowfulness, Emotional imbalance, Despair}

The entire collection of variables H has three segments: B, P, and S.

B stands for the behavioral issues that women in the industry face.

P stands for a physical issue that affects women who work in industries.

S stands for psychological issues that women in the industry face.

The single-valued Neutrosophic Soft Set (M, B) describes the women who have behavioural issues. The ladies experiencing physical problems are described by the single-valued Neutrosophic soft set (M,P). The ladies with psychological issues are described by the single-valued Neutrosophic Soft Set (M,S).

The following is how the single-valued Neutrosophic soft set (M,B) is taken:

Table 1: Shows how the single-valued Neutrosophic soft set (M,B) is taken

W	Anorexia(b_1)	Alcoholism (b_2)	Under Performance (b_3)	Changes in close familrelationships(b_4)
W_1	(.8,.4,.2)	(.7,.5,.3)	(.9,.2,.1)	(.8,.4,.2)
W_2	(.9,.3,.1)	(.8,.2,.1)	(.7,.4,.2)	(.6,.2,.1)
W_3	(.7,.4,.1)	(.6,.4,.1)	(.8,.4,.2)	(.7,.6,.3)
W_4	(.8,.4,.2)	(.9,.7,.4)	(.7,.4,.2)	(.8,.6,.4)
W_5	(.7,.4,.2)	(.8,.4,.3)	(.9,.2,.1)	(.7,.2,.1)
W_6	(.9,.5,.2)	(.8,.6,.4)	(.7,.4,.1)	(.3,.2,.1)

DOI: https://doi.org/10.54216/IJNS.260316

This table describes the single-valued Neutrosophic Soft Set (M, P):

Table 2: Describes the single-valued Neutrosophic Soft Set (M, P)

W	Sore Head (p_1)	Angina Pectoris (p_2)	Muscle Soreness (p_3)	Recurrent illness (p_4)	Hypension (p_5)
W_1	(0.9, 0.4,0.2)	(0.6,0.3,0.1)	(0.4,0.9,0.3)	(0.8,0.5,0.3)	(0.7,0.4,0.3)
W_2	(0.8,0.6,0.4)	(0.9,0.5,0.4)	(0.8,0.5,0.3)	(0.9, 0.4,0.3)	(0.7,0.4,0.5)
W_3	(0.9, 0.5,0.2)	(0.7,0.2,0.1)	(0.3,0.9,0.4)	(0.4,0.8,0.7)	(0.3,0.7,0.8)
W_4	(0.8,0.3,0.1)	(0.9,0.4,0.3)	(0.4,0.7,0.6)	(0.3,0.8,0.2)	(0.9, 0.5,0.2)
W_5	(0.9,0.4,0.2)	(0.7, 0.2, ,0.1)	(0.8,0.4,0.3)	(0.9,0.5,0.3)	(0.8,0.4,0.2)
W_6	(0.8,0.5,0.4)	(0.7,0.6,0.5)	(0.8,0.5,0.3)	(0.7,0.5,0.1)	(0.8,0.2,0.1)

This table describes the single-valued Neutrosophic soft set (M, S):

Table 3: Describes the single-valued Neutrosophic soft set (M, S)

W	Tetchiness (s_1)	Sorrowfulness (s_2)	Emotional imbalance(s_3)	Despair(s_4)
W_1	(. 7, .3, .2)	(.8, .4, .3)	(.9, .7, .2)	(.8, .2, .1)
W_2	(.6, .4, .2)	(.5, .2, .1)	(.8, .2, .1)	(.9, .3, .1)
W_3	(.7, .2, .1)	(.9, .4, .2)	(.9, .2, .1)	(.8, .6, .4)
W_4	(.7, .2, .1)	(.6, .5, .4)	(.8, .7, .5)	(.9, .7, .2)
W_5	(.7, .4, .2)	(.8, .7, .4)	(.9, .3, .2)	(.8, .4, .1)
W_6	(.8, .4, .3)	(.7, .4, .2)	(.9, .3, .1)	(.9, .2, .1)

Twenty factors will be acquired if we do (M, B) ^ (M, P). For all i = 1,2,3,4 & j = 1,2,3,4,5, the framework's requirements, $h_{ij} = b_i$^ p_j. The last instance of the single-valued Neutrosophic soft set, which comprises Neutrosophic sets (M, B) & (M, P), will be represented by (X, Z) (say) with the goal to establish the parameters associated with the single-valued Neutrosophic soft set $Z = \{h_{12}, h_{23}, h_{25}, h_{34}, h_{35}, h_{42}, h_{44}, h_{45}\}$

The table that follows will be the format in which a tabular illustration of the resulting single-valued Neutrosophic soft set is provided:

Table 4: Illustration of the resulting single-valued Neutrosophic soft set is provided

W	h_{12}	h_{23}	h_{25}	h_{34}	h_{35}	h_{42}	h_{44}	h_{45}
w_1	(0.6,0.3,0.2	(0.5,0.2,0.3	(0.7,0.5,0.3	(0.8,0.2,0.2	(0.9,0.2,0.3	(0.6,0.3,0.2	(0.8,0.3,0.2	(0.8,0.4,0.2
w_2	(0.9,0.3,0.4	(0.8,0.2,0.3	(0.5,0.2,0.2	(0.7,0.4,0.2	(0.5,0.3,0.2	(0.6,0.2,0.4	(0.6,0.2,0.1	(0.5,0.2,0.2
w_3	(0.7,0.2,0.1	(0.6,0.4,0.2	(0.6,0.4,0.2	(0.7,0.3,0.2	(0.8,0.4,0.2	(0.7,0.2,0.3	(0.7,0.3,0.3	(0.7,0.5,0.3
w_4	(0.8,0.4,0.3	(0.5,0.2,0.4	(0.9,0.7,0.5	(0.7,0.2,0.2	(0.7,0.4,0.5	(0.8,0.4,0.4	(0.8,0.2,0.4	(0.8,0.5,0.4
w_5	(0.7,0.2,0.2	(0.8,0.4,0.3	(0.8,0.4,0.3	(0.9,0.2,0.3	(0.8,0.2,0.2	(0.7,0.2,0.1	(0.7,0.2,0.3	(0.7,0.2,0.2
w_6	(0.7,0.5,0.5	(0.8,0.5,0.4	(0.8,0.2,0.4	(0.7,0.4,0.1	(0.7,0.2,0.1	(0.3,0.2,0.1	(0.3,0.2,0.1	(0.3,0.2,0.1

DOI: https://doi.org/10.54216/IJNS.260316

Algorithm:

Phase 1: The initial phase involves processing the given input sets (M, B), (M, P), and (M, S) in the corresponding field making use with the single-valued Neutrosophic soft set.

Phase 2: the monitor will provide a report on the input variable set H.

Phase 3: Figuring out how (M, B), (M, P), and (M, S) are calculated yields the final single-valued Neutrosophic soft set (J, L), which is the outcome of evaluating Neutrosophic single-valued soft sets and organizing them in a table format.

Phase 4: For each woman W_i, draw up a progression table with a single-valued Neutrosophic soft set.

Phase 5: The score for each W_i will be examined using tabular analysis.

Phase 6: Applying the aforementioned technique, the end result is $W_k = Max \;\; W_i$. Using the previously indicated method, $W_k = Max \;\; W_i$ is the final outcome.

Suppose that the parameters chosen by the observer are equivalent to

$$P = \{h_{12} \wedge s_1, h_{23} \wedge s_2, h_{25} \wedge s_3, h_{34} \wedge s_1, h_{35} \wedge s_4 \;\; , h_{42} \wedge s_2, h_{44} \wedge s_3, h_{45} \wedge s_4\}$$

We have to select one option from the whole set using the earlier stated standards. The subsequent table format, which is explained below, represents the resultant single-valued Neutrosophic soft set:

Table 5: Represents the resultant single-valued Neutrosophic soft set

W	$h_{12} \wedge s_1$	$h_{23} \wedge s_2$	$h_{25} \wedge s_3$	$h_{34} \wedge s_1$	$h_{35} \wedge s_4$	$h_{42} \wedge s_2$	$h_{44} \wedge s_3$	$h_{45} \wedge s_4$
w_1	(0.6,0.3,0.2)	(0.5,0.2,0.3)	(0.7,0.5,0.3)	(0.7,0.2,0.2)	(0.8,0.2,0.3)	(0.6,0.3,0.3)	(0.8,0.3,0.2)	(0.8,0.4,0.2)
w_2	(0.6,0.3,0.4)	(0.5,0.2,0.1)	(0.5,0.2,0.2)	(0.6,0.4,0.2)	(0.5,0.3,0.2)	(0.5,0.2,0.4)	(0.6,0.2,0.1)	(0.5,0.2,0.1)
w_3	(0.7,0.2,0.1)	(0.6,0.4,0.2)	(0.6,0.2,0.2)	(0.7,0.2,0.2)	(0.8,0.4,0.4)	(0.8,0.4,0.2)	(0.7,0.2,0.1)	(0.7,.2,0.1)
w_4	(0.7,0.2,0.3)	(0.5,0.2,0.4)	(0.5,0.2,0.5)	(0.7,0.2,0.2)	(0.7,0.4,0.5)	(0.6,0.4,0.4)	(0.8,0.2,0.5)	(0.8,0.5,0.5)
w_5	(0.7,0.2,0.2)	(0.8,0.4,0.4)	(0.8,0.3,0.3)	(0.7,0.2,0.3)	(0.8,0.2,0.2)	(0.7,0.2,0.4)	(0.7,0.2,0.3)	(0.7,0.2,0.2)
w_6	(0.7,0.4,0.3)	(0.7,0.4,0.4)	(0.8,0.2,0.4)	(0.7,0.4,0.3)	(0.7,0.2,0.1)	(0.3,0.2,0.2)	(0.3,0.2,0.1)	(0.3,0.2,0.1)

The tabulation form of the single-valued Neutrosophic soft set after de-Neutrosophication is defined as follows:

Table 6: The single-valued Neutrosophic soft set after de-Neutrosophication

W	$h_{12} \wedge s_1$	$h_{23} \wedge s_2$	$h_{25} \wedge s_3$	$h_{34} \wedge s_1$	$h_{35} \wedge s_4$	$h_{42} \wedge s_2$	$h_{44} \wedge s_3$	$h_{45} \wedge s_4$
w_1	0.4	0.4	0.2	0.55	0.55	0.35	0.5	0.4
w_2	0.3	0.5	0.45	0.3	0.35	0.35	0.55	0.5
w_3	0.6	0.3	0.5	0.55	0.3	0.4	0.6	0.6
w_4	0.5	0.35	0.3	0.55	0.25	0.2	0.45	0.15
w_5	0.55	0.3	0.45	0.5	0.6	0.45	0.5	0.55
w_6	0.3	0.25	0.5	0.3	0.6	0.35	0.4	0.4

The single-value Neutrosophic Soft Set that was created above has the progress table shown below.

DOI: https://doi.org/10.54216/IJNS.260316

Table 7: Shows the single-value Neutrosophic Soft Set that was created above has the progress table

	W_1	W_2	W_3	W_4	W_5	W_6
W_1	8	4	3	6	3	6
W_2	5	8	2	6	3	6
W_3	6	6	8	7	6	7
W_4	3	2	2	8	2	4
W_5	6	6	3	6	8	7
W_6	4	5	2	4	2	8

$\in_i$ represents a women's's row total, this formula is used to estimate it.

$$\in_i = \sum_{j=1}^{n} S_{ij}$$

The overall amount of characteristics that are present when W_i leads all of W's components is indicated by the symbol $\in_i$. μ_j represents a student's columns total, W_j.

$$\mu_j = \sum_{i=1}^{n} S_{ij}$$

In this case, μ_j denotes the overall amount of variables for which every element of W dominates W_j, Every Women's row summary, columns summary, and cumulative rating is represented as

$G_i = \in_i - \mu_j$

Table 8: Represents every Women's row summary, columns summary, and cumulative rating

	Summation of Rows $\in_i$	**Summation of Columns μ_j**	**Progressive G_i**
W_1	30	32	-2
W_2	30	31	-1
W_3	40	20	20
W_4	21	37	-16
W_5	36	24	12
W_6	25	38	-13

Result:

By the view of a given progressive table, it is pinpoint that a greater number of scores is quoted around 20, secured by W_3 henceforth, the greatest progressive report comes in the list of W_3.

DOI: https://doi.org/10.54216/IJNS.260316

5. Utilization of Nonagonal single valued Neutrosophic soft set in decision-making problem to analyses the problems of women working in industries.

The Special single-valued Nonagonal Neutrosophic Soft Set (M, B) describes the women who have behavioral issues. The ladies experiencing physical problems are described by the single-valued Neutrosophic soft set (M,P). The ladies with psychological issues are described by the single-valued Neutrosophic Soft Set (M,S).

The following is how the Special single-valued Nonagonal Neutrosophic soft set (M,B) is taken:

Table 9: Shows how the Special single-valued Nonagonal Neutrosophic soft set (M,B) is taken

W	Anorexia(b_1)	Alcoholism (b_2)	Under Performance (b_3)	Changes in close family relationships(b_4)
W_1	(.8, .82,.84,.86, .88,.90,.92,.94,.96; 0.86,0.5,0.4)	(.4,.42,.44, .46,.48,.50, .52,.54,.56; .6,.4,.2)	(.6,.62,.64,.66, .68,.70,.72,.74,.76; 0.8,0.3,0.1)	(.8, .82,.84,.86, .88,.90,.92,.94,.96; 0.6,0.4,0.2)
W_2	(.7,.72,.74,.76, .78,.80,.82,.84,.86; 0.7,0.4,0.3)	(.3,.32,.34,.36, .38,.40,.42,.44,.4 0.4,0.2,0.1)	(.7,.72,.74,.76, .78,.80,.82,.84,.86; 0.7,0.5,0.2)	(.7,.72,.74,.76, .78,.80,.82,.84,.86; 0.9,0.4,0.2)
W_3	(.4,.42,.44,.46, .48,.50,.52,.54, .56;.6,.4,.2)	(.5,.52,.54,.56, .58,.60,.62,.64,.6 0.6,0.4,0.2)	(.4,.42,.44,.46, .48,.50,.52,.54, .56;.8,.4,.2)	.8, .82,.84,.86, .88,.90,.92,.94,.96; 0.8,0.4,0.2)
W_4	(.2,.22,.24,.26, .28,.30,.32,.34,.36; 0.4,0.2,0.1)	(.8, .82,.84,.86, .88,.90,.92,.94,.9 6; 0.8,0.3,0.1)	(.8, .82,.84,.86, .88,.90,.92,.94,.96; 0.7,0.5,0.3)	(.5,.52,.54,.56, .58,.60,.62,.64,.66; 0.8,0.5,0.1)
W_5	(.6,.62,.64,.66, .68,.70,.72,.74,.76; 0.8,0.5,0.4)	(.8, .82,.84,.86, .88,.90,.92,.94,.9 6; 0.7,0.5,0.3)	(.7,.72,.74,.76, .78,.80,.82,.84,.86; 0.8,0.6,0.2)	(.7,.72,.74,.76, .78,.80,.82,.84,.86; 0.7,0.4,0.2)
W_6	(.5,.52,.54,.56, .58,.60,.62,.64,.66; 0.5,0.3,0.2)	(.7,.72,.74,.76, .78,.80,.82,.84,.8 0.9,0.4,0.2)	(.6,.62,.64,.66, .68,.70,.72,.74,.76; 0.7,0.4,0.2)	(.5,.52,.54,.56, .58,.60,.62,.64,.66; 0.8,0.3,0.1)

This table describes the Special single-valued Nonagonal Neutrosophic Soft Set (M, P):

Table 10: Describes the Special single-valued Nonagonal Neutrosophic Soft Set (M, P)

W	Sore Head (p_1)	Angina Pectoris (p_2)	Muscle Soreness (p_3)	Recurrent illness (p_4)	Hypension (p_5)
W_1	(.7,.72,.74,.76, .78,.80,.82,.84,.86; 0.8,0.4,0.2)	(.6,.62,.64,.66, .68,.70,.72,.74, .76; 0.7,0.4,0.2)	(.7,.72,.74,.76, .78,.80,.82,.84, .86; 0.6,0.3,0.1)	(.6,.62,.64,.66, .68,.70,.72,.74, .76; 0.9,0.2,0.1)	(.72,.74,.76, .78,.80,.82,.84, .86,.86; 0.7,0.2,0.1)
W_2	(.82,.84,.86, .88,.90,.92,.94,	(.8, .82,.84,.86, .88,.90,.92,.94,	(.5,.52,.54,.56, .58,.60,.62,.64,.66;	(.72,.74,.76, .78,.80,.82,.84,	(.62,.64,.66, .68,.70,.72,.74,

DOI: https://doi.org/10.54216/IJNS.260316

	.96,.98; .7,0.4,0.2)	.96; .7,0.4,0.2)	0.8,0.2,0.1)	.86,.88; 0.7,0.2,0.1)	.76,.78; 0.8,0.3,0.2)
W_3	(.52,.54,.56, .58,.60,.62,.64, .66,.68; 0.7,0.3,0.2)	(.6,.62,.64,.66, .68,.70,.72,.74,.76; 0.9,0.4,0.2)	(.6,.62,.64,.66, .68,.70,.72,.74,.76; 0.7,0.2,0.1)	(.52,.54,.56, .58,.60,.62,.64, .66,.68; 0.7,0.3,0.1)	(.82,.84,.86, .88,.90,.92,.94, .96,.98; .7,0.4,0.1)
W_4	(.42,.44,.46, .48,.50,.52,.54, .56,0.58; .6,.2,.1)	(.7,.72,.74,.76, .78,.80,.82,.84, .86; 0.7,0.2,0.1)	(.42,.44,.46, .48,.50,.52,.54, .56,0.58; .8,.3,.1)	(.44,.46, .48,.50,.52,.54, .56,0.58,.60; .6,.2,.1)	(.72,.74,.76, .78,.80,.82,.84, .86,.88; 0.9,0.7,0.2)
W_5	(.62,.64,.66, .68,.70,.72,.74, .76,.78; 0.4,0.2,0.1)	(.8, .82,.84,.86, .88,.90,.92,.94, .96; 0.5,0.4,0.1)	(.82,.84,.86, .88,.90,.92,.94, .96,.98; .7,0.2,0.1)	(.32,.34,.36, .38,.40,.42,.44, .46,.48; 0.8,0.3,0.1)	(.8, .82,.84,.86, .88,.90,.92,.94,.96; .8,0.2,0.1)
W_6	(.72,.74,.76, .78,.80,.82,.84, .86,.88; 0.8,0.5,0.2)	(.7,.72,.74,.76, .78,.80,.82,.84, .86; 0.9,0.3,0.2)	(.72,.74,.76, .78,.80,.82,.84, .86,.88; 0.6,0.2,0.1)	(.72,.74,.76, .78,.80,.82,.84, .86,.88; 0.7,0.4,0.1)	(.8, .82,.84,.86, .88,.90,.92,.94,.96; .8,0.3,0.2)

This table describes the Special single-valued Nonagonal Neutrosophic soft set (M, S):

Table 11: Describes the Special single-valued Nonagonal Neutrosophic soft set (M, S)

W	Tetchiness (s_1)	Sorrowfulness (s_2)	Emotional imbalance(s_3)	Despair(s_4)
W_1	(.62,.64,.66, .68,.70,.72,.74, .76,.78; 0.9,0.3,0.1)	(.82,.84,.86, .88,.90,.92,.94, .96,.98; .7,0.2,0.1)	(.62,.64,.66, .68,.70,.72,.74, .76,.78; 0.8,0.3,0.1)	(.52,.54,.56, .58,.60,.62,.64, .66,.68; 0.7,0.2,0.1)
W_2	(.72,.74,.76, .78,.80,.82,.84, .86,.88; 0.8,0.7,0.2)	(.72,.74,.76, .78,.80,.82,.84, .86,.88; 0.8,0.2,0.1)	(.72,.74,.76, .78,.80,.82,.84, .86,.88; 0.7,0.2,0.1)	(.72,.74,.76, .78,.80,.82,.84, .86,.88; 0.8,0.7,0.2)
W_3	(.62,.64,.66, .68,.70,.72,.74, .76,.78; 0.8,0.6,0.2)	(.62,.64,.66, .68,.70,.72,.74, .76,.78; 0.7,0.2,0.1)	(.82,.84,.86, .88,.90,.92,.94, .96,.98; .7,0.2,0.1)	(.52,.54,.56, .58,.60,.62,.64, .66,.68; 0.8,0.4,0.1)
W_4	(.82,.84,.86, .88,.90,.92,.94, .96,.98; .8,0.3,0.2)	(.7,.72,.74,.76, .78,.80,.82,.84, .86; 0.8,0.5,0.1)	(.52,.54,.56, .58,.60,.62,.64, .66,.68; 0.7,0.2,0.1)	(.72,.74,.76, .78,.80,.82,.84, .86,.88; 0.8,0.2,0.1)

DOI: https://doi.org/10.54216/IJNS.260316

W_5	(.72,.74,.76, .78,.80,.82,.84, .86,.88; 0.9,0.3,0.1)	(.6,.62,.64,.66, .68,.70,.72,.74, .76; 0.7,0.3,0.2)	(.8, .82,.84,.86, .88,.90,.92,.94, .96; .8,0.4,0.2)	(.62,.64,.66, .68,.70,.72,.74, .76,.78; 0.7,0.4,0.2)
W_6	(.42,.44,.46, .48,.50,.52,.54, .56,0.58; .7,.2,.1)	(.72,.74,.76, .78,.80,.82,.84, .86,.88; 0.6,0.2,0.1)	(.7,.72,.74,.76, .78,.80,.82,.84, .86; 0.88,0.4,0.1)	(.8, .82,.84,.86, .88,.90,.92,.94,.96; .7,0.4,0.1)

Twenty factors will be acquired if we do (M, B) ^ (M, P). For all i = 1,2,3,4 & j = 1,2,3,4,5, the framework's requirements, $h_{ij} = b_i ^ p_j$. The last instance of the Special single-valued Nonagonal Neutrosophic soft set, which comprises Neutrosophic sets (M, B) & (M, P), will be represented by (X, Z) (say) with the goal to establish the parameters associated with the single-valued Neutrosophic soft set $Z = \{h_{12}, h_{23}, h_{25}, h_{34}, h_{35}, h_{42}, h_{44}, h_{45}\}$

The table that follows will be the format in which a tabular illustration of the resulting Special single-valued Nonagonal Neutrosophic soft set is provided

Table 12: Illustration of the resulting Special single-valued Nonagonal Neutrosophic soft set

W	h_{12}	h_{23}	h_{25}	h_{34}	h_{35}	h_{42}	h_{44}	h_{45}
w_1	(.6,.62,.64,.6 .68,.70,.72,. .76; 0.7,0.4,0.4)	(.4,.42,.44,.46, .48,.50,.52,.54, .56;.6,.3,.2)	(.4,.42,.44,.46, .48,.50,.52,.54, .56;.6,.2,.2)	(.6,.62,.64,.6 .68,.70,.72,.7 .76; 0.8,0.2,0.1)	(.6,.62,.64,.6 .68,.70,.72,.7 .76; 0.7,0.2,0.1)	(.6,.62,.64,.6 .68,.70,.72,.7 .76; 0.6,0.4,0.2)	(.6,.62,.64,.6 .68,.70,.72,.7 .76; 0.6,0.2,0.2)	(.72,.74,.76, .78,.80,.82,.8 .86,.88; 0.6,0.2,0.2)
w_2	(.7,.72,.74,.7 .78,.80,.82,. .86; 0.7,0.4,0.3)	(.3,.32,.34, .36,.38,.40, .42,.44,.46; 0.4,0.2,0.1)	(.3,.32,.34,.36, .38,.40,.42,.44,.4 0.4,0.2,0.2)	(.7,.72,.74,.7 .78,.80,.82,.8 .86; 0.7,0.2,0.2)	(.62,.64,.66, .68,.70,.72, .74,.76,.78; 0.7,0.3,0.2)	(.7,.72,.74,.7 .78,.80,.82,.8 .86; 0.7,0.4,0.2)	(.7,.72,.74,.7 .78,.80,.82,.8 .86; 0.7,0.2,0.2)	(.62,.64,.66, .68,.70,.72,.7 .76,.78; 0.8,0.3,0.2)
w_3	(.4,.42,.44,.4 .48,.50,.52,. .56;.6,.4,.2)	(.5,.52,.54,.56, .58,.60,.62,.64,. 0.6,0.4,0.2)	(.5,.52,.54, .56,.58,.60, .62,.64,.66; 0.6,0.4,0.2)	(.4,.42,.44,.4 .48,.50,.52,.5 .56;.7,.3,.2)	(.4,.42,.44,.4 .48,.50,.52,.5 .56;.7,.4,.3)	(.6,.62,.64,.6 .68,.70,.72,.7 .76; 0.8,0.4,0.2)	(.52,.54,.56, .58,.60,.62,.6 .66,.68; 0.7,0.3,0.2)	(.8, .82,.84, .86,.88,.90 .92,.94,.96; 0.7,0.4,0.2)
w_4	(.2,.22,.24,.2 .28,.30, .32,.34, .36; 0.4,0.2,0.1)	(.42,.44,.46, .48,.50,.52, .54,.56,0.58; .7,.2,.1)	(.72,.74,.76, .78,.80,.82,.84, .86,.88; 0.8,0.3,0.2)	(.44,.46, .48,.50,.52,.5 .56,.58,.60;.6)	(.72,.74,.76, .78,.80,.82,.8 .86,.88; 0.7,0.5,0.2)	(.5,.52,.54,.5 .58,.60,.62,.6 0.7,0.2,0.1)	(.44,.46, .48,.50,.52,.5 .56,.58,.60;.6)	(.5,.52,.54, .56,.58,.60,. 62,.64,.66; 0.8,0.5,0.2)
w_5	(.6,.62,.64,.6 .68,.70,.72,. .76; 0.5,0.4,0.4)	(.8, .82,.84,.86, .88,.90,.92,.94,. 96; 0.7,0.2,0.3)	(.8, .82,.84,.86, .88,.90,.92,.94,.9 6; 0.7,0.2,0.3)	(.32,.34,.36, .38,.40,.42,.4 .44,.46,.48; 0.8,0.3,0.2)	(.7,.72,.74,.7 .78,.80,.82,.8 .86; 0.8,0.2,0.2)	(.7,.72,.74,.7 .78,.80,.82,.8 .86; 0.5,0.4,0.2)	(.32,.34,.36, .38,.40,.42,.4 .44,.46,.48; 0.7,0.3,0.2)	(.7,.72,.74,.7 .78,.80,.82,.8 .86; 0.7,0.2,0.2)
w_6	(.5,.52,.54,.5 .58,.60,.62,. 0.5,0.3,0.2)	(.7,.72,.74,.76, .78,.80,.82,.84, .86; 0.6,0.2,0.2)	(.7,.72,.74,.76, .78,.80,.82,.84, .86; 0.8,0.3,0.2)	(.6,.62,.64,.6 .68,.70,.72,.7 .76; 0.7,0.4,0.2)	(.6,.62,.64,.6 .68,.70,.72,.7 .76; 0.7,0.3,0.2)	(.5,.52,.54,.5 .58,.60,.62,.6 0.8,0.3,0.2)	(.5,.52,.54,.5 .58,.60,.62,.6 0.7,0.3,0.1)	(.5,.52,.54,.5 .58,.60,.62,.6 0.8,0.3,0.2)

DOI: https://doi.org/10.54216/IJNS.260316

Algorithm:

Phase 1: The initial phase involves processing the given input sets (M, B), (M, P), and (M, S) in the corresponding field making use with the Special single-valued Nonagonal Neutrosophic soft set.

Phase 2: the monitor will provide a report on the input variable set H.

Phase 3: Figuring out how (M, B), (M, P), and (M, S) are calculated yields the final Special single-valued Nonagonal Neutrosophic soft set (J, L), which is the outcome of evaluating special single-valued Nonagonal Neutrosophic soft sets and organizing them in a table format.

Phase 4: For each woman W_i, draw up a progression table with a single-valued Neutrosophic soft set.

Phase 5: The score for each W_i will be examined using tabular analysis.

Phase 6: Applying the aforementioned technique, the end result is $W_k = Max \ \ W_i$. Using the previously indicated method, $W_k = Max \ \ W_i$ is the final outcome.

Suppose that the parameters chosen by the observer are equivalent to

$$P = \{h_{12} \wedge s_1, h_{23} \wedge s_2, h_{25} \wedge s_3, h_{34} \wedge s_1, h_{35} \wedge s_4 \ \ , h_{42} \wedge s_2, h_{44} \wedge s_3, h_{45} \wedge s_4\}$$

We have to select one option from the whole set using the earlier stated standards. The subsequent table format, which is explained below, represents the resultant Special single-valued Nonagonal Neutrosophic soft set:

Table 13: Represents the resultant Special single-valued Nonagonal Neutrosophic soft set

W	$h_{12} \wedge s_1$	$h_{23} \wedge s_2$	$h_{25} \wedge s_3$	$h_{34} \wedge s_1$	$h_{35} \wedge s_4$	$h_{42} \wedge s_2$	$h_{44} \wedge s_3$	$h_{45} \wedge s_4$
w_1	(.6,.62,.64, 66,.68,.70, .72,.74,.76; 0.7,0.3,0.4)	(.4,.42,.44, .46,.48,.50, .52,.54,.56; .6,.2,.2)	(.4,.42,.44, .46,.48,.50, .52,.54,.56; .6,.2,.2)	(.6,.62,.64, .66,.68,.70, .72,.74,.76; 0.7,0.4,0.4)	(.52,.54,.5 .58,.60,.62, .64,.66,.68; 0.6,0.2,0.2)	(.6,.62,.64, .66,.68,.70, .72,.74,.76; 0.7,0.4,0.4)	(.6,.62,.64, .66,.68,.70, .72,.74,.76; 0.7,0.4,0.4)	(.52,.54,.56, .58,.60,.62, .64,.66,.68; 0.6,0.2,0.2)
w_2	(.7,.72,.74, .76,.78,.80, .82,.84,.86; 0.7,0.4,0.3)	(.3,.32,.34, .36,.38,.40, .42,.44,.46; 0.4,0.2,0.1)	(.3,.32,.34, .36,.38,.40, .42,.44,.46; 0.4,0.2,0.2)	(.7,.72,.74, .76,.78,.80, .82,.84,.86; 0.7,0.2,0.2)	(.62,.64,.66 .68,.70,.72, .74,.76,.78; 0.7,0.3,0.2)	(.7,.72,.74, .76,.78,.80, .82,.84,.86; 0.7,0.2,0.2)	(.7,.72,.74, .76,.78,.80, .82,.84,.86; 0.7,0.2,0.2)	(.62,.64,.66, .68,.70,.72, .74,.76,.78; 0.8,0.3,0.2)
w_3	(.4,.42,.44, .46,.48,.50, .52,.54,.56; .6,.4,.2)	(.5,.52,.54, .56,.58,.60, .62,.64,.66; 0.6,0.2,0.2)	(.5,.52,.54, .56,.58,.60, .62,.64,.66; 0.6,0.2,0.2)	(.4,.42,.44, .46,.48,.50, .52,.54,.56; .7,.3,.2)	(.4,.42,.44, .46,.48,.50, .52,.54,.56; .7,.4,.3)	(.6,.62,.64, .66,.68,.70,. 72,.74,.76; 0.7,0.4,0.4)	(52,.54,.56, .58,.60,.62, .64,.66,.68; 0.7,0.4,0.2)	(.52,.54,.56, .58,.60,.62, .64,.66,.68; 0.7,0.4,0.2)
w_4	(.2,.22,.24, .26,.28,.30, .32,.34,.36; 0.4,0.2,0.2)	(.42,.44,.46, .48,.50,.52, .54,.56,.58; .6,.4,.2)	(.52 .54,.56 .58,.60,.62, .64,.66,.68; 0.7,0.2,0.2)	(.44,.46,.48 ,.50,.52,.54 ,.56,.58,.60; .6,.4,.2)	(.72,.74,.7 78,.80,.82,. 84,.86,.88; 0.7,0.2,0.2)	(.5,.52,.54, .56,.58,.60, .62,.64,.66; 0.7,0.2,0.1)	(.44,.46,.48, .50,.52,.54, .56,.58,.60; .6,.4,.2)	(.5,.52,.54, .56,.58,.60, .62,.64,.66; 0.8,0.2,0.2)
w_5	(.6,.62,.64, .66,.68,.70, .72,.74,.76;	(.6,.62,.64, .66,.68,.70, .72,.74,.76;	(.8, .82,.84, .86,.88,.90, .92,.94,.96;	(.32,.34,.3 .38,.40,.42, .44,.46,.48;	(.62,.64,.6 .68,.70,.72, .74,.76,.78;	(.6,.62,.64, .66,.68,.70, .72,.74,.76;	(.32,.34,.36, .38,.40,.42, .44,.46,.48;	(.62,.64,.66, .68,.70,.72, .74,.76,.78;

DOI: https://doi.org/10.54216/IJNS.260316

	0.7,0.4,0.4)	0.7,0.4,0.4)	0.7,0.2,0.3)	0.8,0.3,0.2)	0.7,0.2,0.2)	0.5,0.3,0.2)	0.7,0.3,0.2	0.7,0.2,0.2)
w_6	(.42,.44,.46, .48,.50,.52 ,.54,.56,.58; .6,.2,.2)	(.7,.72,.74, .76,.78,.80, .82,.84,.86; 0.6,0.2,0.2)	(.7,.72,.74, .76,.78,.80, .82,.84,.86; 0.8,0.3,0.2)	(.42,.44, .46,.48,.50, .52,.54,.56; .6,.4,.2)	(.6,.62,.64, .66,.68,.70, .72,.74,.76; 0.7,0.3,0.2)	(.5,.52,.54, .56,.58,.60 .62,.64,.66; 0.6,0.2,0.2)	(.5,.52,.54, .56,.58,.60, .62,.64,.66; 0.7,0.3,0.1)	(.5,.52,.54, .56,.58,.60, .62,.64,.66; 0.7,0.3,0.2)

The tabulation form of the Special single-valued Nonagonal Neutrosophic soft set after de-Neutrosophication is defined as follows:

Table 14: The Special single-valued Nonagonal Neutrosophic soft set after de-Neutrosophication

W	$h_{12} \wedge s_1$	$h_{23} \wedge s_2$	$h_{25} \wedge s_3$	$h_{34} \wedge s_1$	$h_{35} \wedge s_4$	$h_{42} \wedge s_2$	$h_{44} \wedge s_3$	$h_{45} \wedge s_4$
w_1	0.68	0.50	0.54	0.78	0.67	0.71	0.71	0.63
w_2	0.78	0.39	0.24	0.85	0.74	0.85	0.85	0.76
w_3	0.48	0.61	0.61	0.51	0.48	0.73	0.65	0.61
w_4	0.28	0.56	0.65	0.55	0.87	0.65	0.58	0.64
w_5	0.64	0.72	0.93	0.43	0.76	0.68	0.42	0.76
w_6	0.51	0.82	0.85	0.54	0.72	0.61	0.63	0.61

The Special single-value Nonagonal Neutrosophic Soft Set that was created above has the progress table shown below.

Table 15: The Special single-value Nonagonal Neutrosophic Soft Set

	W_1	W_2	W_3	W_4	W_5	W_6
W_1	8	2	5	4	4	5
W_2	3	2	8	4	3	3
W_3	6	8	6	5	5	6
W_4	4	3	4	8	3	4
W_5	4	4	5	5	8	5
W_6	2	2	6	4	5	8

$\in_i$ represents a women’s's row total, this formula is used to estimate it.

$$\in_i = \sum_{j=1}^{n} S_{ij}$$

The overall amount of characteristics that are present when W_i leads all of W's components is indicated by the symbol $\in_i$.

μ_j represents a student's columns total, W_j.

DOI: https://doi.org/10.54216/IJNS.260316

$$\mu_j = \sum_{i=1}^{n} S_{ij}$$

In this case, μ_j denotes the overall amount of variables for which every element of W dominates W_j, Every Women's row summary, columns summary, and cumulative rating is represented as

$G_i = \in_i - \mu_j$

Table 16: Represent every Women's row summary, columns summary, and cumulative rating

	Summation of Rows ρ_i	Summation of Columns C_j	Progressive S_i
W_1	28	27	1
W_2	23	34	-11
W_3	36	21	15
W_4	26	30	-4
W_5	31	28	3
W_6	27	31	-4

Result:

By the view of a given progressive table, it is pinpoint that a greater number of scores is quoted around 15, secured by W_3 henceforth, the greatest progressive report comes in the list of W_3.

6. Conclusion

In this research, we developed and focused on the systematic classification of issues faced by female employees using the single-valued neutrosophic soft set framework. Our comparative study of the special single-valued nonagonal neutrosophic soft set allowed us to gain deeper insights into the challenges encountered by women across various sectors. Notably, the analysis revealed that women listed as W_3 were the most significantly affected by these issues. The outcomes derived from the multi-viewer input component informed our subsequent action plan, emphasizing the importance of data-driven decision-making. By establishing a comparison table that illustrates the equilibrium of single values, we effectively demonstrated the utility of the neutrosophic soft set evolution in categorizing and understanding the complexities of workplace challenges. This methodology not only enhances our comprehension of gender-specific issues but also serves as a foundation for developing targeted interventions to support female employees. Moving forward, it is crucial to implement the proposed strategies and continuously monitor their impact, ensuring that we promote a more equitable and supportive work environment for women across all sectors.

References

[1] M. Ali, L. H. Son, I. Deli, and N. D. Tien, "Bipolar neutrosophic soft sets and applications in decision making," *Journal of Intelligent & Fuzzy Systems*, vol. 33, no. 6, pp. 4077–4087, 2017.

[2] I. Deli, "Interval-valued neutrosophic soft sets and its decision making," *International Journal of Machine Learning and Cybernetics*, vol. 8, no. 2, pp. 665–676, 2017.

[3] S. Broumi, "Generalized neutrosophic soft set," *International Journal of Computer Science and Engineering Information Technology*, vol. 3, no. 2, pp. 1–6, 2013. [Online]. Available: https://doi.org/10.5121/ijcseit.2013.3202

[4] S. Debnath, "Single-valued neutrosophic covering-based rough set model over two universes and its application in MCDM," *Neutrosophic Sets and Systems*, vol. 53, no. 1, pp. 29, 2023.

DOI: https://doi.org/10.54216/IJNS.260316

[5] A. Mehmood, F. A. W. A. D. Nadeem, G. Nordo, M. Zamir, C. Park, H. Kalsoom, and M. I. Khan, "Generalized neutrosophic separation axioms in neutrosophic soft topological spaces," *Neutrosophic Sets and Systems*, vol. 7, no. 1, pp. 37, 2020.

[6] M. Saqlain, M. N. Jafar, and M. Riaz, "A new approach of neutrosophic soft set with generalized fuzzy TOPSIS in application of smartphone selection," *Neutrosophic Sets and Systems*, vol. 32, pp. 306, 2020.

[7] A. S. Richard, N. Jose Parvin Praveena, and A. Rajkumar, "Special single valued octagonal neutrosophic number and its applications using MATLAB programming," *Journal of Intelligent & Fuzzy Systems*, vol. 45, no. 1, pp. 687-698, 2023.

[8] P. K. Maji, "A neutrosophic soft set approach to a decision making problem," *Annals of Fuzzy Mathematics and Informatics*, vol. 3, no. 2, pp. 313–319, 2012.

[9] M. Irfan Ali, et al., "On some new operations in soft set theory," *Computers and Mathematics with Applications*, vol. 57, no. 9, pp. 1547–1553, 2009.

[10] S. Mahmood, "Dissimilarity of fuzzy soft points and its applications," *Fuzzy Information and Engineering*, vol. 8, pp. 281-294, Sep. 2016.

[11] A. Kandil, O. A. El-Tantawy, S. A. El-Sheikh, and S. S. El-Sayed, "Fuzzy soft connected sets in fuzzy soft topological spaces II," *Journal of the Egyptian Mathematical Society*, vol. 25, no. 2, pp. 171-177, 2017.

[12] P. K. Maji, "Neutrosophic soft set," *Computers and Mathematics with Applications*, vol. 45, pp. 555-562, 2013.

[13] Z. Pawlak, "Rough sets," *International Journal of Information and Computer Sciences*, vol. 11, pp. 341-356, 1982.

[14] D. A. Molodtsov, "Soft set theory—first results," *Computers and Mathematics with Applications*, vol. 37, pp. 19-31, 1999.

[15] M. Ganster and I. L. Reilly, "Locally closed sets and LC-continuous maps," *International Journal of Mathematics and Mathematical Sciences*, vol. 12, pp. 1-6, 1989.

DOI: https://doi.org/10.54216/IJNS.260316