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3.2 Example

Consider a PUSC (δ, A) over R , where $R = \{h_1, h_2, h_3, h_4\}$ is the collection of four cases under consideration of a decision making to purchase, and $A = \{e_1, e_2, e_3\}$ is the collection of paramaters where e_1 students for the parameter "Cheap" e_2 students for the parameter "Beautiful" and e_3 students for the parameter "Good location" the PUSC (δ, A) describes the "attractivencss of the house" to this decision maker. Suppose that

R	$Cheap(e_1)$	$Beautiful(e_2)$	$Goodlocation(e_3)$
h_1	(0.6, 0.3, 0.1)	(0.3, 0.5, 0.2)	(0.7, 0.5, 0.4)
h_2	(0.1, 0.4, 0.6)	(0.3, 0.4, 0.5)	(0.1, 0.7, 0.9)
h_3	(0.3, 0.7, 0.9)	(0.4, 0.6, 0.7)	(0.2, 0.5, 0.7)
h_4	(0.2, 0.5, 0.8)	(0.5, 0.7, 0.9)	(0.3, 0.5, 0.7)

For convence of explanation, we can also represent PUSC (δ, A) which is described the above matrix form as follows:

$$(\delta, A) = \begin{matrix} & e_1 & e_2 & e_3 \\ \begin{matrix} h_1 \\ h_2 \\ h_3 \\ h_4 \end{matrix} & \left(\begin{matrix} (0.6, 0.3, 0.1) & (0.3, 0.5, 0.2) & (0.7, 0.5, 0.4) \\ (0.1, 0.4, 0.6) & (0.3, 0.4, 0.5) & (0.1, 0.7, 0.9) \\ (0.3, 0.7, 0.9) & (0.4, 0.6, 0.7) & (0.2, 0.5, 0.7) \\ (0.2, 0.5, 0.8) & (0.5, 0.7, 0.9) & (0.3, 0.5, 0.7) \end{matrix} \right) \end{matrix}$$

3.3 Definition

Let (δ, A) and (Δ, B) be two Picture Uncertainty soft collection's (PUSC's) over U . Then (δ, A) is said to picture Uncertainty soft subset of (Δ, B) , denoted by $(\delta, A) \subseteq (\Delta, B)$ if

- (i) $A \subseteq B$ and
- (ii) $F(e) \subseteq G(e)$ for all $e \in A$.

3.4 Example

Let $U = \{C_1, C_2, C_3, C_4, C_5\}$ and $E = \{e_1, e_2, e_3, e_4, e_5, e_6\}$. Suppose (δ, A) and (Δ, B) are two Picture Uncertainty soft set's (PUSC's) over U given by $A = \{e_1, e_2, e_3\}$ and $B = \{e_1, e_2, e_4, e_5\}$.

$$(\delta, A) = \begin{matrix} & e_1 & e_2 & e_3 \\ \begin{matrix} C_1 \\ C_2 \\ C_3 \\ C_4 \\ C_5 \end{matrix} & \begin{pmatrix} (0.3, 0.2, 0.1) & (0.2, 0.7, 0.3) & (0.1, 0.5, 0.1) \\ (0.2, 0.2, 0.3) & (0.8, 0.6, 0.1) & (0.1, 0.6, 0.7) \\ (0.1, 0.3, 0.6) & (0.7, 0.3, 0.2) & (0.2, 0.3, 0.1) \\ (0.3, 0.1, 0.2) & (0.3, 0.1, 0.5) & (0.3, 0.7, 0.4) \\ (0.2, 0.1, 0.6) & (0.2, 0.3, 0.7) & (0.5, 0.6, 0.2) \end{pmatrix} \end{matrix}$$

$$(\Delta, B) = \begin{matrix} & e_1 & e_2 & e_4 & e_5 \\ \begin{matrix} C_1 \\ C_2 \\ C_3 \\ C_4 \\ C_5 \end{matrix} & \begin{pmatrix} (0.6, 0.2, 0.1) & (0.1, 0.2, 0.4) & (0.1, 0.7, 0.6) & (0.7, 0.5, 0.2) \\ (0.5, 0.3, 0.2) & (0.2, 0.4, 0.6) & (0.2, 0.7, 0.5) & (0.1, 0.2, 0.3) \\ (0.1, 0.3, 0.2) & (0.3, 0.0, 0.7) & (0.3, 0.2, 0.1) & (0.3, 0.5, 0.2) \\ (0.1, 0.0, 0.7) & (0.3, 0.7, 0.6) & (0.1, 0.6, 0.2) & (0.7, 0.3, 0.8) \\ (0.0, 0.3, 0.1) & (0.1, 0.2, 0.3) & (0.5, 0.7, 0.2) & (0.1, 0.3, 0.5) \end{pmatrix} \end{matrix}$$

then δ_A is picture Uncertainty soft subset of Δ_B .

3.5 Definition

Two PUS collections δ_A and Δ_B over U are called to be picture Uncertainty softset equal, if and only if δ_A is a picture Uncertainty soft subset of Δ_B and Δ_B is a picture Uncertainty soft subset of δ_A . That is if $(\delta, A) \subseteq (\Delta, B)$ and $(\delta, B) \subseteq (\Delta, A)$ then $\delta_A = \Delta_B$.

3.6 Definition

Let δ_A be a Picture Uncertainty soft collection PUSC over U . The complement of δ_A , denoted by δ_A^C , where $\delta_A^C : A \rightarrow PFS(U)$ is mapping given by $\delta_{(e)}^C = \{\delta_{(e)}\}^C$ for all $e \in A$.

3.7 Example

Consider the PUS collection δ_A then the complement of δ_A is represented as

$$(\delta_A)^C = \begin{matrix} & e_1 & e_2 & e_3 \\ \begin{matrix} h_1 \\ h_2 \\ h_3 \\ h_4 \end{matrix} & \begin{pmatrix} (0.1, 0.3, 0.6) & (0.2, 0.5, 0.3) & (0.4, 0.5, 0.7) \\ (0.6, 0.4, 0.9) & (0.5, 0.4, 0.3) & (0.9, 0.7, 0.1) \\ (0.9, 0.7, 0.3) & (0.7, 0.6, 0.4) & (0.7, 0.5, 0.2) \\ (0.8, 0.5, 0.2) & (0.9, 0.7, 0.5) & (0.7, 0.5, 0.3) \end{pmatrix} \end{matrix}$$

By using the previous idea by Molodtsov, [14] we discuss the AND and OR operation on two PUS collections as proved.

3.8 Definition

Let δ_A and Δ_B are PUS collections over U . Then δ_A AND δ_B , denoted by $\delta_A \cap \delta_B$.

3.9 Example

Let $U = \{C_1, C_2, C_3, C_4\}$ and $E = \{e_1, e_2, e_3, e_4, e_5\}$. Take $A = \{e_1, e_2\}$ and $B = \{e_1, e_3, e_5\}$, define

$$\delta_A = \begin{matrix} & e_1 & e_2 \\ \begin{matrix} C_1 \\ C_2 \\ C_3 \\ C_4 \end{matrix} & \begin{pmatrix} (0.2, 0.3, 0.4) \\ (0.1, 0.4, 0.6) \\ (0.2, 0.0, 0.8) \\ (0.1, 0.2, 0.4) \end{pmatrix} & \begin{pmatrix} (0.1, 0.3, 0.4) \\ (0.3, 0.2, 0.1) \\ (0.1, 0.3, 0.6) \\ (0.2, 0.4, 0.1) \end{pmatrix} \end{matrix} \text{ and}$$

$$\Delta_B = \begin{matrix} & e_1 & e_3 & e_5 \\ \begin{matrix} h_1 \\ h_2 \\ h_3 \\ h_4 \end{matrix} & \begin{pmatrix} (0.1, 0.7, 0.6) \\ (0.2, 0.4, 0.3) \\ (0.1, 0.3, 0.6) \\ (0.7, 0.1, 0.8) \end{pmatrix} & \begin{pmatrix} (0.2, 0.4, 0.7) \\ (0.1, 0.3, 0.8) \\ (0.4, 0.6, 0.2) \\ (0.7, 0.6, 0.3) \end{pmatrix} & \begin{pmatrix} (0.1, 0.3, 0.6) \\ (0.2, 0.6, 0.7) \\ (0.1, 0.4, 0.6) \\ (0.1, 0.0, 0.2) \end{pmatrix} \end{matrix}$$

Here $\delta_A \cap \Delta_B = (H, C)$, where $C = A \cap B$ and $\forall e \in C$

$$H(e) = \begin{cases} \delta(e), & \text{if } x e \in A - B \\ \Delta(e), & \text{if } x e \in B - A \\ \delta(e) \cap \Delta(e), & \text{if } e \in A \cap B \end{cases}$$

in this example

$$\delta_A \cap \Delta_B = (H, C) = \begin{matrix} & e_1 \\ \begin{matrix} h_1 \\ h_2 \\ h_3 \\ h_4 \end{matrix} & \begin{pmatrix} (0.2, 0.3, 0.4) \\ (0.1, 0.4, 0.6) \\ (0.2, 0.0, 0.8) \\ (0.1, 0.2, 0.4) \end{pmatrix} \end{matrix}$$

3.10 Definition

Let δ_A and Δ_B are PUS collections over U . Then δ_A OR Δ_B , denoted by $\delta_A \cup \Delta_B$.

$$\delta_A \cup \Delta_B = \begin{matrix} & (e_1, e_1) & (e_1, e_3) & (e_1, e_5) & (e_2, e_1) & (e_2, e_3) & (e_2, e_5) \\ \begin{matrix} C_1 \\ C_2 \\ C_3 \\ C_4 \end{matrix} & \left(\begin{matrix} (0.2, 0.3, 0.4) & (0.2, 0.3, 0.7) & (0.1, 0.3, 0.6) & (0.1, 0.3, 0.6) & (0.1, 0.3, 0.7) & (0.1, 0.3, 0.6) \\ (0.1, 0.4, 0.6) & (0.1, 0.3, 0.8) & (0.1, 0.4, 0.7) & (0.2, 0.2, 0.3) & (0.1, 0.2, 0.8) & (0.2, 0.2, 0.7) \\ (0.1, 0.0, 0.8) & (0.2, 0.0, 0.8) & (0.1, 0.0, 0.8) & (0.1, 0.3, 0.6) & (0.1, 0.3, 0.6) & (0.1, 0.3, 0.6) \\ (0.1, 0.1, 0.8) & (0.1, 0.2, 0.4) & (0.1, 0.0, 0.4) & (0.2, 0.1, 0.8) & (0.2, 0.4, 0.3) & (0.1, 0.0, 0.2) \end{matrix} \right) \end{matrix}$$

Here $\delta_A \cup \Delta_B = (H, C)$, where $C=(A \cup B)$ and for all $e \in C$.

$$K(e) = \begin{cases} \delta(e), & \text{if } x e \in A - B \\ \Delta(e), & \text{if } x e \in B - A \\ \delta(e) \cup \Delta(e), & \text{if } e \in A \cap B \end{cases}$$

$$(\delta_A \cup \Delta_B) = (H, C) = \begin{matrix} & e_1 & e_2 & e_3 & e_5 \\ \begin{matrix} C_1 \\ C_2 \\ C_3 \\ C_4 \end{matrix} & \left(\begin{matrix} (0.2, 0.3, 0.4) & (0.1, 0.3, 0.4) & (0.2, 0.4, 0.7) & (0.1, 0.3, 0.6) \\ (0.1, 0.4, 0.6) & (0.4, 0.2, 0.1) & (0.1, 0.3, 0.8) & (0.2, 0.6, 0.7) \\ (0.0, 0.0, 0.8) & (0.1, 0.3, 0.6) & (0.4, 0.3, 0.2) & (0.1, 0.4, 0.6) \\ (0.1, 0.2, 0.4) & (0.2, 0.4, 0.1) & (0.7, 0.6, 0.3) & (0.1, 0.0, 0.2) \end{matrix} \right) \end{matrix}$$

3.11 Theorem[Demorgon's Law]

Let δ_A and Δ_B be two PUS collections over U . Then (i) $(\delta_A \cap \Delta_B)^C = \delta_A^C \cup \Delta_B^C$

(ii) $(\delta_A \cup \Delta_B)^C = \delta_A^C \cap \Delta_B^C$.

Proof

$$\begin{aligned}
 (i) \text{ Suppose that } (\delta, A) \cap (\Delta, B) &= (K, A \times B) \\
 (\delta, A) \cap (\Delta, B)^C &= (K, A \times B)^C \\
 &= (K^C, A \times B) \\
 \text{Now } (\delta, A)^C \cup (\Delta, B)^C &= (\delta^C, A) \cup (\Delta^C, B) \\
 &= (H, A \times B).
 \end{aligned}$$

Take $(\alpha, \beta) \in A \times B$, Therefore

$$\begin{aligned}
 K^C(\alpha, \beta) &= \{K(\alpha, \beta)\}^C \\
 &= \{\delta(\alpha) \cap \Delta(\beta)\}^C \\
 &= \delta^C(\alpha) \cup \Delta^C(\beta) \\
 \text{agian } H(\alpha, \beta) &= \delta^C(\alpha) \cup \Delta^C(\beta) \\
 H^C(\alpha, \beta) &= H(\alpha, \beta)
 \end{aligned}$$

The theorem is proved

(ii) The result can be proved in a similar way.

3.12 Theorem

Union of two PUS collections δ_A and Δ_B is a PUS collection.

Proof

We know that, Let (δ_A) and (Δ_B) are PUS collections over U . Then δ_A OR Δ_B , denoted by $\delta_A \cup \Delta_B$. and $\forall e \in C, e \in A \rightarrow B, \text{ or } e \in B \rightarrow A$, then $K(e) = \delta(e)$ or $K(e) = \Delta(e)$. So, in either case, we have $K(e)$ is a picture Uncertainty soft collection. If $e \in A \cap B$, for a fixed $x \in U$ without loss of generality, suppose $\lambda_{\delta(e)}(x) \leq \lambda_{\Delta(e)}(x)$,

$$\begin{aligned}
 \text{we have } \lambda_{K(e)}(x) + \mu_{K(e)}(x) + \gamma_{K(e)}(x) &= \\
 \max\{\lambda_{\delta(e)}(x), \lambda_{\Delta(e)}(x)\} + \min\{\mu_{\delta(e)}(x), \mu_{\Delta(e)}(x)\} + \min\{\gamma_{\delta(e)}(x), \gamma_{\Delta(e)}(x)\} \\
 &= \lambda_{\Delta(e)}(x) + \min\{\mu_{\delta(e)}(x), \mu_{\Delta(e)}(x)\} + \min\{\gamma_{\delta(e)}(x), \gamma_{\Delta(e)}(x)\} \\
 &\leq \lambda_{\Delta(e)}(x) + \mu_{\Delta(e)}(x) + \gamma_{\Delta(e)}(x) \leq 1
 \end{aligned}$$

Therefore (K, C) is a picture Uncertainty soft collection (PUSC).

Hence the proof.

3.13 Theorem

Intersection of two PUS collections δ_A and Δ_B is a PFS set.

Proof

we know that, Let δ_A and Δ_B are PUS collections over U . Then δ_A OR Δ_B , denoted by $\delta_A \cup \Delta_B$. and $\forall e \in U$, without loss of generality, suppose $\lambda_{\delta(e)}(x) \leq \lambda_{\Delta(e)}(x)$,

$$\begin{aligned} & \text{we have } \lambda_{K(e)}(x) + \mu_{K(e)}(x) + \gamma_{K(e)}(x) = \\ & \text{Min}\{\lambda_{\delta(e)}(x); \lambda_{\Delta(e)}(x)\} + \text{Max}\{\mu_{\delta(e)}(x), \mu_{\Delta(e)}(x)\} + \text{Max}\{\gamma_{\delta(e)}(x), \gamma_{\Delta(e)}(x)\} \\ & = \lambda_{\Delta(e)}(x) + \text{Min}\{\mu_{\delta(e)}(x), \mu_{\Delta(e)}(x)\} + \text{Max}\{\gamma_{\delta(e)}(x), \gamma_{\Delta(e)}(x)\} \\ & \leq \lambda_{\Delta(e)}(x) + \mu_{\Delta(e)}(x) + \gamma_{\Delta(e)}(x) \leq 1 \end{aligned}$$

There fore (K, C) is a PUS collection. Hence the proof.

3.14 Theorem

Let δ_A, Δ_B and K_C be PUS collections over U . Then (i) $\delta_A \cap \delta_B = \delta_A$ (ii)

$$\delta_A \cup \delta_A = \delta_A.$$

$$(iii) (\delta_A \cap \Delta_B) = (\Delta_B \cup \delta_A) \quad (iv) (\delta_A \cup \Delta_B) = (\Delta_B \cap \delta_A).$$

$$(v) (\delta_A \cup \Delta_B) \cup K_C = \delta \cup (\Delta_B \cup K_C) \quad (vi) (\delta_A \cap \Delta_B) \cap K_C = \delta \cap (\Delta_B \cap K_C).$$

Proof

The proofs are strightforward by using the definitions((3.5),(3.8),(3.10)) and Theorem(3.11)

(i) Let δ_A and Δ_B are PUS collections over U . Then δ_A AND δ_B , denoted by $\delta_A \cap \delta_B$.

(ii) Let δ_A and Δ_B are PUS collections over U . Then δ_A OR δ_B , denoted by $\delta_A \cup \delta_B$

(iii) Let $A, B, C \in PF(R)$, then (i) If $A \subseteq B$ and $B \subseteq C$ then $A \subseteq C$

$$(ii) (A^C)^C = A$$

(iii) Operations \cap and \cup are commutative, associative and distributive.

3.15 Theorem [Distributive Law]

Let δ_A, Δ_B and K_C be PUC collections over U . Then (i) $\delta_A \cap (\Delta_B \cup K_C) = (\delta_A \cap \Delta_B) \cup (\delta_A \cap K_C)$ (ii) $\delta_A \cup (\Delta_B \cap K_C) = (\delta_A \cup \Delta_B) \cap (\delta_A \cup K_C)$

Proof

The proofs are straightforward by using the definition((3.5),(3.8),(3.10)) and Theorem(3.14).

(i) Let δ_A and Δ_B are PFS sets over U . Then δ_A AND δ_B , denoted by " $\delta_A \cap \delta_B$ ".

(ii) Let δ_A and Δ_B are PUC collections over U . Then δ_A OR δ_B , denoted by " $\delta_A \cup \delta_B$ "

(iii) Let $A, B, C \in PF(R)$, then (iv) If $A \subseteq B$ and $B \subseteq C$ then $A \subseteq C$

(v) $(A^C)^C = A$

(iii) Operations \cap and \cup are commutative, associative and distributive.

3.16 Theorem [Dual Law]

Let δ_A, Δ_B and K_C be PUS collections over U . Then (i) $(\delta_A \cap \Delta_B)^C = \delta_A^C \cup \Delta_B^C$, if and only if $A=B$

(ii) $(\delta_A \cup \Delta_B)^C = \delta_A^C \cap \Delta_B^C$. iff $A=B$

Proof

(i) If $A=B$, Then we have $\delta_A \cup \Delta_B = \delta_A \cup \Delta_A = (K, A)$. Now for all $e \in A$, $K(e) = \delta(e) \cup \Delta(e)$ Hence $(\delta_A \cap \Delta_B)^C = (\delta_A \cap \Delta_A)^C = (K, A)^C = (K^C, A)$ and $K^C(e) = (\delta(e) \cup \Delta(e))^C = \delta^C(e) \cap \Delta^C(e)$. Again suppose that $(\delta_A \cap \Delta_B)^C = (\delta_A \cap \Delta_A)^C = (I, A)^C = (I^C, A) = (I, A)$ for all $e \in A$. $I(e) = \delta^C(e) \cup \Delta^C(e)$ we see that for all $e \in A$. $I(e) = K^C(e)$. Therefore this result is true.

Conversely, hypotheses $A \neq B$. Suppose that $\delta_A \cup \Delta_B = (K, C)$ where $C = A \cup B$ and for all $e \in C$.

$$K(e) = \begin{cases} \delta(e), & \text{if } x e \in A - B \\ \Delta(e), & \text{if } x e \in B - A \\ \delta(e) \cup \Delta(e), & \text{if } e \in A \cap B \end{cases}$$

Thus $(\delta_A \cup \Delta_B)^C = K^C$ and

$$K^C(e) = \begin{cases} \delta^C(e), & \text{if } x e \in A - B \\ \Delta^C(e), & \text{if } x e \in B - A \\ \delta^C(e) \cap \Delta^C(e), & \text{if } e \in A \cap B \end{cases}$$

Again suppose that $\delta_A^C \cap \Delta_B^C = (I, J)$. Where $J = A \cap B$ and $\forall e \in J$. $I(e) = \delta^C(e) \cap \Delta^C(e)$. obviously, where $A \neq B$, we have $C = A \cup B \neq A \cap B = J$, so $K^C \neq I_J$. This is contradiction of over condition. $(\delta_A \cap \Delta_B)^C = \delta_A^C \cup \Delta_B^C$.

Hence $A=B$.

(ii) This result can be proved in a similar way.

3.17 Remark

From the above theorem for dual theorem,we know that Demorgon’s laws are invalied for PUS collections with the different parameters collections, but they are true for PUS collections with the identical parameter set.

4 Picture Uncertainty Soft Relations and its Decision Making

In this part,we construct picture Uncertainty soft operator and a decision making method on relations.

Now we construct a decision making method on picture Uncertainty soft relation by the following algorithm:

step-1 Input the picture Uncertainty soft collections A and B

step-2 Obtain the picture Uncertainty soft matrix R corresponding to cartesian product of A and B respectively.

step-3 Compute the comparision table using the following formula $P_A(r) + I_A(r) - N_A(r)$.

step-4 Select the hight numerical grades from comparison table for each row.

step-5 Find the solve table which having the following form

R	(x_1, y_1)	(x_n, y_n)
<i>(Objects)</i>	h_1			
<i>(Highestgrade)</i>				

where X_n denotes the parameter of A and y_n denotes the parameter of B .

step-6 Compute the solve of each objects by taking the sum of these numerical grades.

step-7 Find m , for which $S_m = \max S_j$. then S_m is the hight score,if m has most then one values,you can choose any one value S_j .

Now we use this algorithm to find the best choice in decision making system.

4.1 Example

Let $U = \{u_1, u_2, u_3, u_4\}$ be the set of four cars. Suppose that two friends want to buy a car for a mutual friend among these four cars according to their choice parameters $E_1 = \{x_1, x_2, x_3\} = \{\text{Expensive, moderate, inexpensive}\}$ and $E_2 = \{y_1, y_2, y_3\} = \{\text{Green, Black, Red}\}$ respectively, then we select a car on the basis of the collections of friends parameters by using the picture Uncertainty soft collection of relation decision making method.

step-1 We input the picture Uncertainty soft collection A and B as

$$A = \begin{matrix} & u_1 & u_2 & u_3 & u_4 \\ \begin{matrix} x_1 \\ x_2 \\ x_3 \end{matrix} & \begin{pmatrix} (0.3, 0.6, 0.4) & (0.2, 0.4, 0.5) & (0.3, 0.6, 0.7) & (0.3, 0.5, 0.7) \\ (0.1, 0.3, 0.4) & (0.1, 0.3, 0.3) & (0.2, 0.4, 0.5) & (0.1, 0.3, 0.9) \\ (0.3, 0.3, 0.4) & (0.4, 0.6, 0.7) & (0.3, 0.4, 0.5) & (0.3, 0.7, 0.9) \end{pmatrix} \end{matrix}$$

$$\text{and } B = \begin{matrix} & u_1 & u_2 & u_3 & u_4 \\ \begin{matrix} x_1 \\ x_2 \\ x_3 \end{matrix} & \begin{pmatrix} (0.4, 0.6, 0.7) & (0.2, 0.4, 0.5) & (0.4, 0.4, 0.6) & (0.3, 0.5, 0.9) \\ (0.2, 0.3, 0.5) & (0.3, 0.5, 0.6) & (0.2, 0.4, 0.5) & (0.1, 0.5, 0.9) \\ (0.2, 0.3, 0.4) & (0.2, 0.8, 0.8) & (0.3, 0.6, 0.6) & (0.1, 0.4, 0.7) \end{pmatrix} \end{matrix}$$

step-2 we obtain the picture Uncertainty soft matrix R corresponding to cartesian product of A and B respectively

R	u_1	u_2	u_3	u_4
(x_1, y_1)	(0.3, 0.6, 0.7)	(0.2, 0.4, 0.5)	(0.3, 0.5, 0.7)	(0.3, 0.5, 0.7)
(x_1, y_2)	(0.1, 0.45, 0.4)	(0.2, 0.45, 0.6)	(0.2, 0.5, 0.7)	(0.1, 0.45, 0.9)
(x_1, y_3)	(0.2, 0.45, 0.7)	(0.2, 0.6, 0.8)	(0.3, 0.6, 0.7)	(0.1, 0.45, 0.7)
(x_2, y_1)	(0.1, 0.45, 0.7)	(0.1, 0.4, 0.6)	(0.2, 0.4, 0.6)	(0.1, 0.4, 0.9)
(x_2, y_2)	(0.1, 0.3, 0.5)	(0.1, 0.4, 0.6)	(0.2, 0.4, 0.5)	(0.1, 0.4, 0.9)
(x_2, y_3)	(0.1, 0.3, 0.4)	(0.1, 0.055, 0.8)	(0.2, 0.5, 0.6)	(0.1, 0.35, 0.9)
(x_3, y_1)	(0.3, 0.4, 0.7)	(0.2, 0.5, 0.7)	(0.3, 0.4, 0.6)	(0.3, 0.06, 0.9)
(x_3, y_2)	(0.2, 0.3, 0.5)	(0.3, 0.055, 0.7)	(0.2, 0.4, 0.5)	(0.3, 0.6, 0.7)
(x_3, y_3)	(0.2, 0.3, 0.4)	(0.2, 0.7, 0.8)	(0.3, 0.5, 0.6)	(0.3, 0.6, 0.9)

Table -2 picture Uncertainty soft relational matrix R .

Step-3 By using table-1, we compute the comparison table as

R	u_1	u_2	u_3	u_4
(x_1, y_1)	0.2	0.1	0.1	0.1
(x_1, y_2)	-0.15	0.05	0	-0.35
(x_1, y_3)	-0.05	0.00	0.2	-0.15
(x_2, y_1)	-0.15	-0.1	0.00	-0.4
(x_2, y_2)	-0.1	-0.1	0.1	-0.4
(x_2, y_3)	0.00	-0.645	0.1	-0.45
(x_3, y_1)	0.05	0.00	0.1	-0.54
(x_3, y_2)	0.00	-0.345	0.1	0.2
(x_3, y_3)	0.1	0.1	0.2	0.2

Table -2 comparison table (P+I-N).

step-4 we select the highest numerical grade from step-3 for each row

R	u_1	u_2	u_3	u_4
(x_1, y_1)	0.2	0.1	0.1	0.1
(x_1, y_2)	-0.15	0.05	0	-0.35
(x_1, y_3)	-0.05	0.00	0.2	-0.15
(x_2, y_1)	-0.15	-0.1	0.00	-0.4
(x_2, y_2)	-0.1	-0.1	0.1	-0.4
(x_2, y_3)	0.00	-0.645	0.1	-0.45
(x_3, y_1)	0.05	0.00	0.1	-0.54
(x_3, y_2)	0.00	-0.345	0.1	0.2
(x_3, y_3)	0.1	0.1	0.2	-0.745

Table-3 Highest value of each row

step-5 we find the score table which have the following form

R	u_1	u_2	u_3	u_4
(x_1, y_1)	0.2	-	-	-
(x_1, y_2)	-	0.05	-	-
(x_1, y_3)	-	-	0.2	-
(x_2, y_1)	-	-	0	-
(x_2, y_2)	-	-	0.1	-
(x_2, y_3)	-	-	0.1	-
(x_3, y_1)	-	-	0.1	-
(x_3, y_2)	-	-	-	0.2
(x_3, y_3)	-	-	0.2	-

Table -4 is score table.

step-6 we compute the score of each objects by taking the form of numerical grades as;

$$u_1 = 0.2,$$

$$u_2 = 0.05,$$

$$u_3 = 0.2 + 0 + 0.1 + 0.1 + 0.2 = 0.7,$$

$$u_4 = 0.2$$

step-7 The maximum value of the score value is $S_j = 0.7$, so the two friends will select the car with the highest score, hence they will choose car u_3 . with parameter either expensive car with red or expensive car with red.

5 Conclusion

We have defined a picture Uncertainty soft collection with some special operations and proved various result based on the picture Uncertainty soft collection. Finally we study the decision making approach for solving picture Uncertainty soft matrix under relational concepts. One can obtain the similar result in fermatean Uncertainty soft collection and pythagonger Uncertainty soft collections.

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