AN APPLICATION OF INTUITIONISTIC FUZZY SOFT MULTI SET IN DECISION MAKING

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Abstract: The paper explains more properties of intuitionistic fuzzy soft Multi sets. We here define intuitionistic fuzzy soft multi set relations, its type including equivalence relation. Composition and the equivalence of the inverse relation when relation satis_es the equivalence property are discussed. The notion of intuitionistic fuzzy soft multi sets are tried to apply in a decision making problem which describes the spread of a plant known as Makaniya Micrantha. Finally we use distance formula for intuitionistic fuzzy soft multi set, which lead to a conclusion to which area has maximum and minimum spread of this plant there by giving a result, to which area the destruction of the plant is require and in which area its to be promoted. We establish several important results with adequate examples.

Keywords: Fuzzy Sets, Soft Sets, Multi Sets, Fuzzy Topology.

Introduction: Many kind of uncertainties rule the human mind and perceptions. In most of the engineering, physics, chemical, computer sciences, biological economics, social sciences and medical sciences problems human mind deal with this uncertainties. These may be due to the uncertainties or vagueness of natural environmental phenomena of human knowledge or perceptions. Vagueness or uncertainty in the boarder or boundary between continents, or between countries or between urban areas and rural areas or the exact continuous growth and death rate of population in a countries rural area are some instances. Thus ordinary set theory, which is based on the crisp and we can see exact case may not be fully suitable for handling such kind of problems of vagueness and uncertainty. Even though various number of mathematical tools like probability theory, fuzzy sets [1] , soft sets Molodtsov [3] rough sets [2] are well known and are proven as efficient models for dealing with vagueness and uncertainties. Even though they has distinguished advantages and certain limitations. Parametrization was not done before 1990s. This inadequacy of parametrization tools was perfectly cleared by Molodtsov [3] by introducing a new concept named soft set theory. Maji [4] presented an application of soft sets in decision making problems for the first time, that was based on the reduction of parameters to keep the optimal choice of objects. Chen [5] presented a new definition of soft set parametrization reduction. Ali et. al., presented some new kind of algebraic operations for soft set theory. The concept of soft set relations are introduced as a sub soft set of the cartesian product of the soft sets in [10]. Combining soft sets with fuzzy sets , Maji et al [6] defined fuzzy soft sets which have rich potentials for solving decision making problems. As a generalization of Molodtsov soft set Alkhazaleh [7] presented the definition of a soft multi set and he defined basic operations such as complement, union, and intersection etc. Salleh and Alkhazaleh presented

the application of soft multi set in decision making problem. Different operator such as AND, OR operator on soft multiset and DeMorgans laws was proved by [11] Babitha. In 2011 Salleh gave a brief review literature survey from soft sets to intuitionistic fuzzy soft sets. In 2012 Alkhazaleh and Salleh [8] introduced the concept of fuzzy soft multi set theory and studied the application of such an etended version of set theory. Operations on anti fuzzy graphs was done by Seethalakshmi[14]. R. Padmapriya and P Thangavelu. [15] explained on “Topologies generated by fuzzy sets”. K Bageerathi[16], put forward a generalized study of fuzzy semi closed sets in fuzzy topological spaces.

This paper is an attempt to apply the theory of fuzzy soft multi set theory in intuitionestic fuzzy soft multi set relation. An application is also accompanied to support the theory.

Preliminaries:

Definition 1.1: [3] Let U be an initial universe set and E be set of parameters. Let P(U) denotes the power set of U and $A \subseteq U$. A pair (F, A) is called a soft set over U, where F is a mapping given by $F : A \to P(U)$.

Definition 1.2. [9]: A Multiset M drawn from the set X is represented by a function Count M or C_M defined as $C_M : X \to N$, where N represents the set of non negative integers.

Definition 1.3. [4]: Let U be an initial universal set and let E be a set of parameters. Let I^U denote the power set of all fuzzy subsets of U. Let $A \subseteq E$. A pair (F, E) is called a fuzzy soft set over U, where F is a mapping given by $F : A \to I^U$.

Definition 1.4. [8]: Let $\{U_i : i \in I\}$ be a collection of universes such that $\cap_{i\in I} U_i = \phi$ and let $\{E_{U_i} : i \in I\}$ be a collection of sets of parameters. Let $U = \pi_{i\in I} P(U_i)$ where $P(U_i)$ denotes the power set of U_i, $E = \pi_{i\in I} E_{U_i}$ and $A \subseteq E$. A pair (F,A) is called a fuzzy soft multiset over U, where F is a mapping given by $F : A \to U$, for all e in A. $F(e) = (\{\frac{u}{\mu_{F(e)}(u)}\} : i \in I)$.

Definition 1.5. [8]: The union of two soft multisets (F,A) and (G,B) over U, denoted by $F, A) \cup (G, B)$ is the soft multiset (H,C) where $C = A \cup B, \forall \varepsilon \in C,$

$H(\varepsilon) = F(\varepsilon),$ if $\varepsilon \in A - B$

= $G(\varepsilon),$ if $\varepsilon \in B - A$

= $F(\varepsilon) \cap G(\varepsilon)$, if $\varepsilon \in A \cap B$

Definition 1.6. [8:] The intersection of two soft multisets (F,A) and (G,B) over U, denoted by $F, A) \cap (G, B)$ is the soft multiset (H,C) where $C = A \cup B, \forall \varepsilon \in C,$

$H(\varepsilon) = F(\varepsilon),$ if $\varepsilon \in A - B$

= $G(\varepsilon),$ if $\varepsilon \in B - A$

= $F(\varepsilon) \cup G(\varepsilon)$, if $\varepsilon \in A \cap B$

Similar results can be taken from fuzzy soft multi sets also.

Definition 1.7. [13]: The normalized Euclidean distance between two intuitionistic fuzzy set A and B is defined as

dn = H(A;B)

$$= d_{n-H(A,B)} (\frac{1}{2n} \sum_{n}^{i=1} [(\mu_A(\mathrm{x}_i) - \mu_B(\mathrm{x}_i))^2 + \nu_A(\mathrm{x}_i) - \nu_B(\mathrm{x}_i))^2 + \pi_A(\mathrm{x}_i) - \pi_B(\mathrm{x}_i))^2)^{\frac{1}{2}}.$$ X

={x1, x2,..... xn} for i=1,2,3,....n.

Intuitionistic Fuzzy Soft Multi Set Relations:

Definition 2.1: Let (F,A) and (G,B) be two intuitionistic fuzzy soft multi sets over U. Then the Cartesian product of (F,A) and (G,B) is defined as (F,A) × (G,B) = $\{(a_i, b_j)$: min(($\eta_{F(a)}$(ak); $\eta_{G(b)}$(ak)), max($\mu_{F(a)}$(ak); $\mu_{G(b)}$(ak)))/u $\in U_i$.

Example 2.2. Consider two intuitionistic fuzzy soft multi sets (F,A) and (F2,B)as follows

(F1,A) = {(a₁,({ $\frac{h_1}{0.5,0.3},\frac{h_2}{0.4,0.3},\frac{h_3}{0.1,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.8,0.1},\frac{r_2}{0.5,0.3},\frac{r_3}{0,0}\},\{\frac{p_1}{0.8,0.1},\frac{p_2}{0,0}\}$)

(a_2,({ $\frac{h_1}{0.9,0.1},\frac{h_2}{0.5,0.4},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.7,0.2},\frac{r_2}{0,0},\frac{r_3}{0,0}\},\{\frac{p_1}{0.5,0.4},\frac{p_2}{0,0}\}$)

(F2,B) = {(a_1,({ $\frac{h_1}{0.7,0.3},\frac{h_2}{0.7,0.3},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.8,0.1},\frac{r_2}{0,0},\frac{r_3}{0,0}\},\{\frac{p_1}{0.5,0.3},\frac{p_2}{0,0}\}$)

(a_2,({ $\frac{h_1}{0.9,0.1},\frac{h_2}{0.5,0.4},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0,0},\frac{r_2}{0,0},\frac{r_3}{0,0}\},\{\frac{p_1}{0.8,0.2},\frac{p_2}{0,0}\}$))}

(F1,A)× (F1,A) = {((a1,b1), ($\frac{h_1}{0.2,0.3},\frac{h_2}{0,0.2},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.8,0.2},\frac{r_2}{0,0},\frac{r_3}{0,0}\},\{\frac{p_1}{0.5,0.4},\frac{p_2}{0,0}\}$

(a_1,b_2),($\frac{h_1}{0.2,0.3},\frac{h_2}{0.2,0.3},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0,0},\frac{r_2}{0.2,0.3},\frac{r_3}{0,0}\},\{\frac{p_1}{0,0},\frac{p_2}{0,0}\}$

(a_2,b_1), ($\frac{h_1}{0.7,0.2},\frac{h_2}{0.4,0.3},\frac{h_3}{0.5,0.3},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.7,0.2},\frac{r_2}{0.5,0.3},\frac{r_3}{0,0}\},\{\frac{p_1}{0.5,0.4},\frac{p_2}{0,0}\}$

(a_2,b_2), ($\frac{h_1}{0.9,0.1},\frac{h_2}{0.5,0.3},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0,0},\frac{r_2}{0,0},\frac{r_3}{0,0}\},\{\frac{p_1}{0.5,0.4},\frac{p_2}{0,0}\})\}$

Definition 2.3: Consider two intuitionistic fuzzy soft multi sets (F,A) and (G,B) over U. Then the intuitionistic fuzzy soft multi set relation R on (F,A) and (G,B) is a fuzzy soft multi subset of the set (F,A) ×(G,B).
Where R is given by R : A × B →U.

Definition 2.4: An intuitionistic fuzzy soft multi relation R is said to be reflexive if and only if $\mu_{R(a,a)}$(u) = 1 for all u ∈ U and a ∈ A

Example 2.5: Consider a relation R in (F,A) as

{((a1,a1), ($\frac{h_1}{1,0},\frac{h_2}{1,0},\frac{h_3}{1,0},\frac{h_4}{1,0}\})),\{\frac{r_1}{1,0},\frac{r_2}{1,0},\frac{r_3}{1,0}\},\{\frac{p_1}{1,0},\frac{p_2}{1,0}\}$

(a_1,a_2),($\frac{h_1}{0.2,0.3},\frac{h_2}{0.2,0.3},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0,0},\frac{r_2}{0.2,0.3},\frac{r_3}{0,0}\},\{\frac{p_1}{0,0},\frac{p_2}{0,0}\}$

(a_2,a_1), ($\frac{h_1}{0.7,0.2},\frac{h_2}{0.4,0.3},\frac{h_3}{0.5,0.3},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.7,0.2},\frac{r_2}{0.5,0.3},\frac{r_3}{0,0}\},\{\frac{p_1}{0.5,0.4},\frac{p_2}{0,0}\}$

(a_2,a_2), ($\frac{h_1}{1,0},\frac{h_2}{1,0},\frac{h_3}{1,0},\frac{h_4}{1,0}\})),\{\frac{r_1}{1,0},\frac{r_2}{1,0},\frac{r_3}{1,0}\},\{\frac{p_1}{1,0},\frac{p_2}{1,0}\})\}$ then R is a reflexive relation.
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Definition 2.6: Consider an intuitionistic fuzzy soft multi sets (F,A), then a relation R on (F,A) is said to be symmetric if and only if (a, b) ∈ R then (b, a) ∈ R.

Example 2.7: Consider a relation R in (F,A) as

{((a1,b1), ($\frac{h_1}{0.2,0.4},\frac{h_2}{0.2,0.5},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.8,0.1},\frac{r_2}{0,0},\frac{r_3}{0,0}\},\{\frac{p_1}{0.5,0.4},\frac{p_2}{0,0}\}$

$(a_1,b_2),(\frac{h_1}{0.2,0.6},\frac{h_2}{0.6,0.3},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.3,0.5},\frac{r_2}{0.8,0.1},\frac{r_3}{0,0}\},\{\frac{p_1}{0.8,0.1},\frac{p_2}{0,0}\}$

$(b_1,a_1),(\frac{h_1}{0.2,0.7},\frac{h_2}{0.2,0.7},\frac{h_3}{0.5,0.3},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.3,0.5},\frac{r_2}{0.8,0.1},\frac{r_3}{0,0}\},\{\frac{p_1}{0.8,0.1},\frac{p_2}{0,0}\}$

$(a_2,b_2),(\frac{h_1}{0.9,0.1},\frac{h_2}{0.5,0.3},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0,0},\frac{r_2}{0,0},\frac{r_3}{0,0}\},\{\frac{p_1}{0.5,0.4},\frac{p_2}{0,0}\})\}$

Definition 2.8: Consider two intuitionistic fuzzy soft multi set relations R1, R2 in (F,A), the composition of R1 and R2 is defined as $R_1oR_2 : A \times A \rightarrow U$. That is $\mu_{R1oR2\,(a,b)}(u) = {}_k^{\max}\{\min(\eta_{R1(a,k)}(u), \eta_{R2(k,b)}(u)), \max(\mu_{R1(a,k)}(u), \mu_{R2(k,b)}(u))\}$ for all $u \in U_i$, a,b,k $\in$ A

Definition 2.9: Consider an intuitionistic fuzzy soft multi sets (F,A), then a relation R on (F,A) is said to be transitive if and only if RoR $\subseteq$ R

Example 2.10: Consider a relation R in (F,A) as

$\{((a1,b1),(\frac{h_1}{0.3,0.4},\frac{h_2}{0.7,0.2},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.8,0.2},\frac{r_2}{0.8,0.1},\frac{r_3}{0,0}\},\{\frac{p_1}{0.5,0.4},\frac{p_2}{0,0}\}$

$(a_1,b_2),(\frac{h_1}{0.2,0.5},\frac{h_2}{0.6,0.3},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.3,0.5},\frac{r_2}{0.8,0.2},\frac{r_3}{0,0}\},\{\frac{p_1}{0.5,0.3},\frac{p_2}{0,0}\}$

$(a_2,b_1),(\frac{h_1}{0.3,0.5},\frac{h_2}{0.6,0.3},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.3,0.5},\frac{r_2}{0.8,0.1},\frac{r_3}{0,0}\},\{\frac{p_1}{0.5,0.1},\frac{p_2}{0,0}\}$

$(a_2,b_2),(\frac{h_1}{0.9,0.1},\frac{h_2}{0.6,0.2},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.6,0.3},\frac{r_2}{0.8,0.1},\frac{r_3}{0,0}\},\{\frac{p_1}{0.5,0.4},\frac{p_2}{0,0}\})\}$,

then R is a transitive relation.

Definition 2.11: Consider a relation R in an intuitionistic fuzzy soft multi set (F,A). Then R is said to be an equivalence relation if R is reflexive, symmetric, and transitive.

Definition 2.12: Consider a relation R in an intuitionistic fuzzy soft multi set (F,A). Then the inverse of R, denoted by R^{-1} is defined as R^{-1} (a,b) = R(b, a) for all a, b $\in$ A

Example 2.13: Consider a relation R in (F,A) as {((a, a),

$(\frac{h_1}{0.3,0.5},\frac{h_2}{0.7,0.2},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.8,0.2},\frac{r_2}{0.8,0.1},\frac{r_3}{0,0}\},\{\frac{p_1}{0.5,0.4},\frac{p_2}{0,0}\}$

$(a,b),(\frac{h_1}{0.2,0.7},\frac{h_2}{0.6,0.3},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.3,0.5},\frac{r_2}{0.8,0.1},\frac{r_3}{0,0}\},\{\frac{p_1}{0.5,0.4},\frac{p_2}{0,0}\}$

$(b,a),(\frac{h_1}{0.2,0.7},\frac{h_2}{0.6,0.3},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.3,0.5},\frac{r_2}{0.8,0.1},\frac{r_3}{0,0}\},\{\frac{p_1}{0.5,0.4},\frac{p_2}{0,0}\}$

$(b,b),(\frac{h_1}{0.9,0.6},\frac{h_2}{0.6,0.8},\frac{h_3}{0,0},\frac{h_4}{0,0}\})),\{\frac{r_1}{0.6,0},\frac{r_2}{0.8,0},\frac{r_3}{0,0}\},\{\frac{p_1}{0.5,0.4},\frac{p_2}{0,0}\})\}$

(a,b) is the inverse of (b,a).

Theorem 2.14. A relation R is a symmetric intuitionistic fuzzy soft multimrelation on (F,A) if and only if the inverse of R, R^{-1} is symmetric

Proof: Consider the relation R as a symmetric intuitionistic fuzzy soft multi relation on (F,A). Then μ R $^{-1}$ (a,b) = μ R(b,a) = μ R(a,b) = μ R $^{-1}$ (b,a). Therefore μ R $^{-1}$ (a,b) = μ R $^{-1}$ (b,a). Therefore R $^{-1}$ is symmetric.
Conversely assume that R $^{-1}$ is a symmetric fuzzy soft multi set on (F,A).
Then μ R(a,b) = μ R $^{-1}$ (b,a) = μ R $^{-1}$ (a,b) = μ R(b,a). Since μ R(a,b) = μ R(b,a), R is a symmetric intuitionistic fuzzy soft multi relation on (F,A).

Theorem 2.15: A relation R is a reexive ituitionistic fuzzy soft multirelation on (F,A) if and only if the inverse of R, R $^{-1}$ is reflexive.
Proof: Consider the relation R as a reflexive intuitionistic fuzzy soft multirelation on (F,A). Then μ R $^{-1}$ (a,a) = μ R(a,a). Thus R $^{-1}$ is reflexive. Conversely let R $^{-1}$ is a reflexive relation on (F,A). Then μ R(a,a) = R $^{-1}$ (a,a)
Therefore R is reflexive.

Theorem 2.16: A relation R is a transitive intuitionistic fuzzy soft multirelation on (F,A) if and only if the inverse of R, R $^{-1}$ is transitive
Proof: Consider the relation R as a transitive intuitionistic fuzzy soft multirelation on (F,A). For every $a,b \in$ A.

$$\mu_{R^{-1}(a,b)} = \mu_{R(a,b)} \geq \mu_{RoR(b,a)}$$

$$= \overset{ma}{k} \{\min(\eta_{R(b,k)}, \eta_{R(k,a)}), ma(\mu_{R(b,k)}, \mu_{R(k,a)})\}$$

$$= \overset{ma}{k} \{\min(\eta_{R(k,a)}, \eta_{R(b,k)}), ma(\mu_{R(k,a)}, \mu_{R(b,k)})\}$$

$$= \overset{ma}{k} \{\min(\eta_{R^{-1}(a,k)}, \eta_{R^{-1}(k,b)}), ma(\mu_{R^{-1}(a,k)}, \mu_{R^{-1}(k,b)})\}$$

= $\mu_{R^{-1}oR^{-1}(a,b)}$. Hence R $^{-1}$ is a transitive fuzzy soft multi relation on (F,A).

Conversely assume that R $^{-1}$ is a transitive fuzzy soft multi relation on(F,A).
For any (a, a) $\in A \times A$,

$$\mu_{R(a,b)} = \mu_{R^{-1}(b,a)} \geq \mu_{R^{-1}oR^{-1}}$$

$$= \overset{ma}{k} \{\min(\eta_{R^{-1}(b,k)}, \eta_{R^{-1}(k,a)}), ma(\mu_{R^{-1}(b,k)}, \mu_{R^{-1}(k,a)})\}$$

$$= \overset{ma}{k} \{\min(\eta_{R^{-1}(k,a)}, \eta_{R^{-1}(b,k)}), ma(\mu_{R^{-1}(k,a)}, \mu_{R^{-1}(b,k)})\}$$

$$= \overset{ma}{k} \{\min(\eta_{R(a,k)}, \eta_{R(k,b)}), ma(\mu_{R(a,k)}, \mu_{R(k,b)})\}$$

$$= \mu_{RoR(a,b)}$$

2.1 An Application of Intuitionistic Fuzzy Soft Multiset Theory: Invasion of alien plant species is considered as a serious problem that which different countries have to face. Alien plant species invade and badly affect both natural and semi natural ecosystems. Many weed plants contain a variety of metabolites which are harmful as well as beneficial to biotic stresses, whereas same compounds in plants are bene_cial to insects also for their better growth and development to continue their life style. Mikania micrantha is one of the 100 worst alien species. It is among the ten worst exotic species in South-east and South Asia, and one of the 16 exotic species in China. Mikania micrantha, an invasive alien species, is native to Central and South America is one of the serious bio diversity.

Let S = {s1, s2, s3, s4} be the different universes or countries. Consider C={Biological, Medical, Shade, Spread} as the set of decision parameters.
andSu = {Biological property, Medicinal advantage for animals, Medicinal disadvantage for animals, Shade for air fields, quick spread} are the set of subjects relating to the above parameters. That is Micania Micrantha have many advantages as well as disadvantages. Such as we have many many biological aspects we have to learn from this plant. These plants are good to some extend to some animals, but shows serious kidney decease to many
animals. Another thing is it spreads as fast as other plants.

Table 1:Parameters vs Subject

.	Biological	Medical(A)	Medical(D)	Shade	Spread
Biological	(0.81,0.1,0.1)	(0.7,0.21,0.1)	(0.9,0.0,0.11)	(0.6,0.31,0.1)	(0.8,0.11,0.1)
Medical	(0.91,0.1,0.0)	(0.8,0.11,0.1)	(0.8,0.11,0.1)	(0.51, 0.3,0.2)	(0.7,0.21,0.1)
Shade	(0.5,0.31,0.2)	(0.51,0.2,0.3)	(0.9,0.0,0.1)	(0.5,0.41,0.1)	(0.71,0.1,0.2)
Spread	(0.71,0.2,0.1)	(0.5,0.41,0.1)	(0.9,0.11,0.0)	(0.61,0.3, 0.1)	(0.8,0.0,0.21)

Each of these parameter is described by three numbers such as soft multi membership, soft multi non membership, and soft multi hesitation margin. After going through a serious calculations we have the following table

Table 2: Shows Universe vs Subject

.	Biological	Medical(A)	Medical(D)	Shade	Spread
S1	(0.61,0.3,0.1)	(0.5,0.41,0.1)	(0.6,0.21,0.2)	(0.5,0.3,0.2)	(0.5,0.51,0.0)
S2	(0.9,0.11,0.0)	(0.81,0.1,0.1)	(0.8,0.1,0.1)	(0.5, 0.3,0.2)	(0.7,0.2,0.1)
S3	(0.5,0.3,0.2)	(0.5,0.2,0.3)	(0.9,0.0,0.1)	(0.5,0.4,0.1)	(0.7,0.1,0.2)
S4	(0.7,0.21,0.1)	(0.51,0.4,0.1)	(0.9,0.1,0.0)	(0.6,0.31, 0.1)	(0.81,0.0,0.2)

Using the definition cited in the preliminary section we have the following table

Table 3: Universe vs Parameter

.	Biological	Medical	Shade	Spread
S1	0.1007	0.0898	0.0905	0.0806
S2	0.0739	0.0857	0.0592	0.0955
S3	0.0783	0.0806	0.0812	0.0858
S4	0.0832	0.0750	0.0929	0.1015

From the above table, it is clear that the shortest distance gives the proper area determination for each universe. The result is as follows
S1 neads to take the measure to stop the spread of Macania Micrantha.
S2 needs to take step to use Micania Micrantha as a shade for air field etc.
S3 needs to take step to use Micania Micrantha as a research area in biological studies
S4 needs to take step to take Micania Micrantha as a medicinal plant.
So we have seen that each country have different aspects about the same plant, that is each country will have economic growth if the plant is treated in different way.

3. Conclusion: Here we establish many properties if intuitionistic fuzzy soft multi set theory. Here we have gone through the relational properties. Equivalence properties are also discussed. Szmidt's distance between intuitionistic fuzzy setswas discussed and extended to intuitionistic fuzzy soft multi sets throughan application on a decision making problem. The distance formula can beused for various uncertainty problems.

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