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Best Diet for Obesity People to Reduce Obesity using Intuitionistic Fuzzy Soft Matrix

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Abstract: ***Women who are morbidly obese have difficulty breathing and walking and are at greater risk of diabetes, heart disease and hypertension, fat contributes 9 Calories per gram. Limit carbohydrate intake to 55 percent of total calories. The survey is collected from the women of Nagapattinam.***

Keywords: Addition of IFSM, Complement of IFSM, Fuzzy soft Matrix (FSM), Fuzzy soft set (FSS), Intuitionistic fuzzy soft matrix (IFSM), Soft set subtraction of Intuitionistic fuzzy soft matrix

1. Introduction

This paper is based on the survey of house wife who are affected by obesity. Three Categories of women who eat major part of their food is wheat, maida, rice are foods.

About wheat: Wheat is a cereal grain 100 grams of wheat provides 327 calories. wheat is a major ingredient in such foods as bread, porridge, crackers and so on. Wheat is extremely beneficial for healthy living.

About Rice: Rice is the most important grain with regard to human nutrition. Rice contains number of vitamins and minerals 100 gram of rice has 129 calories.

About Maida: Maida is a finely Milled refined and bleached wheat flour, Now a days it is very difficult to live without this beautiful white colour flour called Maida 100 grams of maida contains 364 calories.

2. Preliminaries

In this section, we relates some basis notion of fuzzy soft set theory and fuzzy soft matrix.

2.1 Soft set [10]

Let U be an initial universe set and E be a set of Parameters. Let P(U)denoted the power set of U. Let $A \subseteq E$. A Pair (F_A, E) is called a soft set over I, where F_A is a mapping given by $F_A: E \rightarrow P(U)$ such that $F_A(e) = \phi$, if $e \notin A$. Here F_A is called approximate function of the soft set (F_A, E). The set $F_A(e)$ is called e-approximate value set which consists of related objects of the parameter $e \in E$. In other words, a soft set over U is a parameterized family of subsets of the Universe U.

Example : 2.1

Let $U = \{u_1, u_2, u_3, u_4\}$ be a set of four shares and $E = \{white(e_1), Red(e_2), blue(e_3)\}$ be a set of parameters. In $A = \{e_1, e_2\} \subseteq E$. Let $F_A(e_1) = \{U_1, U_2, U_3\}$ then we write the soft set $(F_A, E) = \{(e_1, \{U_1, U_2, U_3\}), (e_2, \{U_1, U_2, U_3\})\}$, over U which describe the "Colour of the Sharees" Which Mr.X is going to buy. We may represent the soft set in the following form

Table 2.1.1

U	white(e_1)	Red(e_2)	blue(e_3)
u_1	1	1	0
u_2	1	1	0
u_3	0	1	0
u_4	1	0	0

2.2 Fuzzy soft Set [7]

Let U be an initial universe set and E be a set of parameters. Let P(U) denoted the set of all fuzzy sets of U. Let $A \subseteq E$. A Pair (F_A, E) is called a fuzzy soft set (FSS) over U, where F_A is a mapping given by $F_A: E \rightarrow P(U)$ such that $F_A(e) = \tilde{\phi}$, if $e \notin A$, where $\tilde{\phi}$ is a null fuzzy set.

Example 2.2

Consider the example 2.1, here we cannot express with only two real numbers 0 and 1, we can characterized it by a membership function instead of crisp numbers 0 and 1, which associate with each element a real number in the interval [0,1] then

$(F_A, E) = F_A(e_1)$

$= \{(u_1, 0.3), (u_2, 0.4), (u_3, 0.8), (u_4, 0.2)\}$

$(F_A, E) = F_A(e_2)$

$= \{(u_1, 0.2), (u_2, 0.5), (u_3, 0.9), (u_4, 0.3)\}$ is the fuzzy soft set representing the "Colour of the Shares" which Mr.X is going to buy. We may represent the fuzzy soft set in the following form.

Table 2.2.2

U	white(e_1)	Red(e_2)	blue(e_3)
u_1	0.3	0.2	0.0
u_2	0.4	0.5	0.0
u_3	0.8	0.9	0.0
u_4	0.2	0.3	0.0

2.3 Fuzzy soft Matrixes (FSM) [4]

Let (F_A, E) be a fuzzy soft set over U. Then a subset of U E is uniquely defined by $R_A = \{(u,e): e \in A, U \in F_A(e)\}$ which is called Relation form of (F_A, E) . The characteristic function of R_A is written by $\mu_R: U \times E \to [0,1]$, where $\mu_{R\,A}(u,e) \in [0,1]$ is the membership value of $u \in U$ for each $e \in U$ if $[\mu_{ij}] = \mu_{R\,A}(u_j, e_j)$, we can define a matrix

$$[\mu_{ij}]_{m\times n} = \begin{bmatrix} \mu_{11} & \mu_{12} & \cdots & \mu_{1n} \\ \mu_{21} & \mu_{21} & \cdots & \mu_{21} \\ \vdots & \vdots & \vdots & \vdots \\ \mu_{m1} & \mu_{m2} & \cdots & \mu_{mn} \end{bmatrix}$$

which is called an $m \times n$ soft matrix of the soft set (F_A, E) over U. Therefore we can say that a fuzzy soft set (F_A, E) is uniquely characterized by the matrix $[\mu_{ij}]_{m\times n}$ and both concepts are interchangeable.

Example 2.3
Assume that $U = \{u_1, u_2, u_3, u_4, u_5\}$ is a universal set and $E = \{e_1, e_2, e_3, e_4\}$ is a set of all parameters, if $A \subseteq E = \{e_1, e_2, e_3\}$ and

$F_A(e_1) = \{(u_1, 0.3), (u_2, 0.2), (u_3, 0.1), (u_4, 0.5), (u_5, 0.6)\}$

$F_A(e_2) = \{(u_1, 0.6), (u_2, 0.5), (u_3, 0.1), (u_4, 0.4), (u_5, 0.2)\}$

$F_A(e_3) = \{(u_1, 0.8), (u_2, 0.3), (u_3, 0.5), (u_4, 0.4), (u_5, 0.6)\}$

Then the fuzzy soft set (F_A, E) is a parameterized family $\{F_A(e_1), F_A(e_2), F_A(e_3)\}$ of all fuzzy soft set over U. Hence the fuzzy soft $[\mu_{ij}]$ can be written as

$$[\mu_{ij}] = \begin{bmatrix} 0.3 & 0.6 & 0.8 & 0.0 \\ 0.2 & 0.5 & 0.3 & 0.0 \\ 0.1 & 0.1 & 0.5 & 0.0 \\ 0.5 & 0.4 & 0.4 & 0.0 \\ 0.6 & 0.2 & 0.6 & 0.0 \end{bmatrix}$$

2.4 Intuitionistic Fuzzy soft set (IFSS) [8]

Let U be an initial universe. E be the set of parameters and $A \subseteq E$. A Pair $(\tilde{F}_A, E)$ is called an intuitionistic fuzzy soft set (IFSS) over U, where $\tilde{F}_A$ is a mapping given by $\tilde{F}_A: E \to I^U$ denotes the collection of all intuitionistic fuzzy subsets of U.

Example 2.4
Suppose that $U = \{u_1, u_2, u_3, u_4\}$ be a set of four shares $E = \{\text{white}(e_1), \text{Red}(e_2), \text{blue}(e_3)\}$ be a set of parameters, if $A = \{e_1, e_2\} \subseteq E$. Let

$$\tilde{F}_A(e_1) = \left\{ \begin{matrix} (u_1, 0.2, 0.6), (u_2, 0.7, 0.2), (u_3, 0.3, 0.1), \\ (u_4, 0.5, 0.1) \end{matrix} \right\}$$

$$\tilde{F}_A(e_2) = \left\{ \begin{matrix} (u_1, 0.7, 0.2), (u_2, 0.8, 0.2), (u_3, 0.3, 0.4), \\ (u_4, 0.1, 0.2) \end{matrix} \right\}$$

$$(\tilde{F}_A, E) = \left\{ \tilde{F}_A(e_1) = \left\{ \begin{matrix} (u_1, 0.2, 0.6), (u_2, 0.7, 0.2), \\ (u_3, 0.3, 0.1), (u_4, 0.5, 0.1) \end{matrix} \right\} \right\}$$

$$\tilde{F}_A(e_2) = \left\{ \begin{matrix} (u_1, 0.7, 0.2), (u_2, 0.8, 0.2), (u_3, 0.3, 0.4), \\ (u_4, 0.1, 0.2) \end{matrix} \right\}$$

we would represent this intuitionstic fuzzy soft set in matrix format

$$\begin{bmatrix} (0.2, 0.6) & (0.7, 0.2) & (0.0, 0.0) \\ (0.7, 0.2) & (0.8, 0.2) & (0.0, 0.0) \\ (0.3, 0.1) & (0.3, 0.4) & (0.0, 0.0) \\ (0.5, 0.1) & (0.1, 0.2) & (0.0, 0.0) \end{bmatrix}$$

2.5 Intuitionistic fuzzy soft matrix (IFSM) [4]

Let U be an initial universe, E be the set of parameters and $A \subseteq E$. Let $(\tilde{F}_A, E)$ be an intuitionistic fuzzy soft set (IFSS) over U. Then a subset of $U \times E$ is uniquely defined by

$R_A = \{(u,e): e \in A, u \in \tilde{F}_A(e)\}$

which is called Relation form of $(\tilde{F}_A, E)$. The membership and non-membership functions are written by $\mu_{R\,A}: U \times E \to [0,1]$ and $\mu_{R\,A}: (u,e) \in [0,1]$ are the membership value and non-membership value of $u \in U$ for each $e \in E$, if $(\mu_{ij}, \gamma_{ij}) = (\mu_{R\,A}(u_i, e_j), \gamma_{R\,A}(u_i, e_j))$. we define a matrix

$$[(\mu_{ij}, \gamma_{ij})]_{m\times n} = \begin{bmatrix} (\mu_{11}, \gamma_{11}) & (\mu_{12}, \gamma_{12}) & \cdots & (\mu_{1n}, \gamma_{1n}) \\ \vdots & \cdots & \cdots & \\ \vdots & \cdots & \cdots & \\ (\mu_{m1}, \gamma_{m1}) & (\mu_{m2}, \gamma_{m2}) & \cdots & (\mu_{mn}, \gamma_{mn}) \end{bmatrix}$$

which is called an $m \times n$ IFSM of the IFSS $(\tilde{F}_A, E)$ is uniquely characterised by the matrix $[(\mu_{ij}, \gamma_{ij})]_{m\times n}$ and both concepts are interchangeable. The set of all $m \times n$ IFS matrix will be denoted by $IFSM_{m\times n}$.

Example 2.5
Let $U = \{u_1, u_2, u_3, u_4, u_5\}$ is a universal set and $E = \{e_1, e_2, e_3, e_4\}$ is a set of parameters, if $A = \{e_1, e_2, e_3\} \subseteq E$ and

$$\tilde{F}_A(e_1) = \left\{ \begin{matrix} (u_1, 0.4, 0.3), (u_2, 0.7, 0.1), (u_3, 0.6, 0.1), \\ (u_4, 0.1, 0.5) \end{matrix} \right\}$$

$$\tilde{F}_A(e_2) = \left\{ \begin{matrix} (u_1, 0.2, 0.4), (u_2, 0.3, 0.5), (u_3, 0.1, 0.7), \\ (u_4, 0.3, 0.6) \end{matrix} \right\}$$

$$\tilde{F}_A(e_3) = \left\{ \begin{matrix} (u_1, 0.5, 0.1), (u_2, 0.1, 0.0), (u_3, 0.9, 0.1), \\ (u_4, 0.5, 0.3) \end{matrix} \right\}$$

Then the IFSS Set $(\tilde{F}_A, E)$ is a parameterized family $\{\tilde{F}_A(e_1), \tilde{F}_A(e_2), \tilde{F}_A(e_3)\}$ of all IFS Sets over U. Hence IFSM $[(\mu_{ij}, \gamma_{ij})]$ can be written as

$$[(\mu_{ij}, \gamma_{ij})] = \begin{bmatrix} (0.4, 0.3) & (0.2, 0.4) & (0.5, 0.0) & (0.0, 0.0) \\ (0.7, 0.1) & (0.3, 0.5) & (0.1, 0.0) & (0.0, 0.0) \\ (0.6, 0.1) & (0.1, 0.7) & (0.9, 0.1) & (0.0, 0.0) \\ (0.1, 0.5) & (0.3, 0.6) & (0.5, 0.3) & (0.0, 0.0) \end{bmatrix}$$

2.6 Complement of intuitionistic fuzzy soft matrices

Let $\tilde{A} = [(\mu_{ij}^{\tilde{A}}, \gamma_{ij}^{\tilde{A}})] \in IFSM_{m\times n}$. Then complement of $\tilde{A}$ denoted by $\tilde{A}^o$ is defined as $\tilde{A}^o = [(\gamma_{ij}^{\tilde{A}}, \mu_{ij}^{\tilde{A}})]$ for all i and j

$$\tilde{A}^o = [(\gamma_{ij}^{\tilde{A}}, \mu_{ij}^{\tilde{A}})]$$

$$= \begin{bmatrix} (0.3,0.4) & (0.4,0.2) & (0.1,0.5) & (0.0,0.0) \\ (0.1,0.7) & (0.5,0.3) & (0.0,0.1) & (0.0,0.0) \\ (0.1,0.6) & (0.7,0.1) & (0.1,0.9) & (0.0,0.0) \\ (0.5,0.1) & (0.6,0.3) & (0.3,0.5) & (0.0,0.0) \end{bmatrix}$$

2.7 Addition of intuitionistic fuzzy soft Matrices

Let $\tilde{A} = [(\mu_{ij}{}^{\tilde{A}}, \gamma_{ij}{}^{\tilde{A}})] \in IFSM_{m\times n}$, $\tilde{B} = [(\mu_{ij}{}^{\tilde{B}}, \gamma_{ij}{}^{\tilde{B}})] \in IFSM_{m\times n}$, then $\tilde{C} = [(\mu_{ij}{}^{\tilde{C}}, \gamma_{ij}{}^{\tilde{C}})] \in IFSM_{m\times n}$, we define $\tilde{A}+\tilde{B}$, addition of $\tilde{A}$ and $\tilde{B}$ as $\tilde{A}+\tilde{B}+\tilde{C} = \left(\max(\mu_{ij}{}^{\tilde{A}}, \mu_{ij}{}^{\tilde{B}}), \min(\gamma_{ij}{}^{\tilde{A}}, \gamma_{ij}{}^{\tilde{B}})\right)$ for all i and j.

2.8 Subtraction of Intuitionistic fuzzy soft Matrices

Let $\tilde{A} = [(\mu_{ij}{}^{\tilde{A}}, \gamma_{ij}{}^{\tilde{A}})] \in IFSM_{m\times n}$, $\tilde{B} = [(\mu_{ij}{}^{\tilde{B}}, \gamma_{ij}{}^{\tilde{B}})] \in IFSM_{m\times n}$, then $\tilde{C} = [(\mu_{ij}{}^{\tilde{C}}, \gamma_{ij}{}^{\tilde{C}})] \in IFSM_{m\times n}$, we define $\tilde{A}-\tilde{B}$, addition of $\tilde{A}$ and $\tilde{B}$ as $\tilde{A}-\tilde{B}-\tilde{C} = \left(\min(\mu_{ij}{}^{\tilde{A}}, \mu_{ij}{}^{\tilde{B}}), \max(\gamma_{ij}{}^{\tilde{A}}, \gamma_{ij}{}^{\tilde{B}})\right)$ for all i and j.

3. Intuitionistic fuzzy soft Matrices theory Apply in Medical diagnosis

3.1 Value Matrix

Let $\tilde{A} = [(\mu_{ij}{}^{\tilde{A}}, \gamma_{ij}{}^{\tilde{A}})] \in IFSM_{m\times n}$. Then $\tilde{A}$ is said to be value of intuitionistic fuzzy soft matrix denoted by $V(\tilde{A})$ and is defined as

$$V(\tilde{A}) = [(\mu_{ij}{}^{\tilde{A}} - \gamma_{ij}{}^{\tilde{A}})].\ if\ i = 1,2,\dots,M, j = 1,2,\dots,n$$

for all i and j.

3.2 Score Matrix

If $\tilde{A} = [(\mu_{ij}{}^{\tilde{A}}, \gamma_{ij}{}^{\tilde{A}})] \in IFSM_{m\times n}$, $\tilde{B} = [(\mu_{ij}{}^{\tilde{B}}, \gamma_{ij}{}^{\tilde{B}})] \in IFSM_{m\times n}$, then $\tilde{A}$ and $\tilde{B}$ is said to be intuitionistic fuzzy soft score matrix denoted by $S_{(\tilde{A},\tilde{B})} = V(\tilde{A}) - V(\tilde{B})$.

3.3 Total Score

If $\tilde{A} = [(\mu_{ij}{}^{\tilde{A}}, \gamma_{ij}{}^{\tilde{A}})] \in IFSM_{m\times n}$, $\tilde{B} = [(\mu_{ij}{}^{\tilde{B}}, \gamma_{ij}{}^{\tilde{B}})] \in IFSM_{m\times n}$, Let the corresponding value matrix be $V(\tilde{A}), V(\tilde{B})$ and their score matrix is $S_{(\tilde{A},\tilde{B})}$. Then the total score for each u_i in U is

$$S_i = \sum_{j=1}^{n} \left(V(\tilde{A}) - V(\tilde{B})\right)$$

$$= \sum_{j=1}^{n} [(\mu_{ij}{}^{\tilde{A}} - \gamma_{ij}{}^{\tilde{A}}) - (\mu_{ij}{}^{\tilde{B}} - \gamma_{ij}{}^{\tilde{B}})]$$

4. Methodology

Suppose U is a set of Obesity people to reduce obesity. This will be Scientifically selected and tested by the dieticians according to the product of Wheat, Rice, Maida ate by the obesity people. Dieting is the practice of eating food in a regulated and Supervised fashion to decrease, Maintain (or) increase body weight. In otherwords, it is conscious control (or) restriction of the diet. A restricted diet is often used by those who are overweight (or) obese. Let E be a set of parameters of obesity people to reduce the body weight. We construct IFSS $(\tilde{F}_A, E)$ over U represent the selection of obesity people by the dietician expert X where $\tilde{F}_A$ is a mapping $\tilde{F}_A : E \to I^U$, is the collection of all intuitionistic fuzzy subsets of U. We further construct another IFSS $(\tilde{G}_B, E)$ over U represent the selection of obesity people by the dietician Y. where $\tilde{G}_B$ is a mapping $\tilde{G}_B : E \to I^U$, I^U is the collection of all intuitionistic fuzzy subsets of U. The matrices $\tilde{A}$ and $\tilde{B}$ corresponding to the intuitionistic fuzzy soft sets $(\tilde{F}_A, E)$ and $(\tilde{G}_B, E)$ are constructed. We compute the complements $(\tilde{F}_A, E)^0$ and $(\tilde{G}_B, E)^0$ respectively. Then compute $\tilde{A}+\tilde{B}$ which is the maximum membership of obesity people who will be selected by the dieticians. Further compute $\tilde{A}^0 + \tilde{B}^0$ which is the maximum membership of non selection of obesity people by the dieticians. Using definition (3.1) compute $V(\tilde{A}+\tilde{B})$, $V(\tilde{A}^0+\tilde{B}^0)$ and $S\left((\tilde{A}+\tilde{B}), (\tilde{A}^0+\tilde{B}^0)\right)$ and the total score secured S_i for each obesity people in U. Finally $S_K = Max(S_i)$, then we conclude that the obesity people U_K has been selected by the dieticians. If S_K has more than one value occurs and by investigating this process repeatedly by representing

Algorithm

Step 1: Input the intuitionistic fuzzy soft set $(\tilde{F}_A, E)$, $(\tilde{G}_B, E)$ and obtain the intuitionistic fuzzy soft matrices $\tilde{A}, \tilde{B}$ corresponding to $(\tilde{F}_A, E)$ and $(\tilde{G}_B, E)$ respectively.

Step 2: Write the intuitionistic fuzzy soft complement sets $(\tilde{F}_A, E)^0$, $(\tilde{G}_B, E)^0$ and obtain the intuitionistic fuzzy soft matrices $\tilde{A}^0, \tilde{B}^0$ corresponding to $(\tilde{F}_A, E)^0$ and $(\tilde{G}_B, E)^0$ respectively.

Step 3: Compute $(\tilde{A}+\tilde{B})$, $(\tilde{A}^0+\tilde{B}^0)$, $V(\tilde{A}+\tilde{B})$, $V(\tilde{A}^0+\tilde{B}^0)$ and $S\left((\tilde{A}+\tilde{B}), (\tilde{A}^0+\tilde{B}^0)\right)$.

Step 4: Compute the total score S_i for each u_i in U.

Step 5: Find $S_K = Max(S_i)$ conclude the best diet for the obesity people.

Step 6: If S_K has more than one value then go to step 1. So as to repeat the process by reassessing the parameter for selecting the best diet for obesity people.

5. Case Study

Let $(\tilde{F}_A, E)$ and $(\tilde{G}_B, E)$ be two intuitionistic fuzzy soft set representing the selection of four obesity peoplt from the universal set $U = \{u_1, u_2, u_3, u_4\}$ by the dieticians X and Y. Let parameters which stand for different types of diet like " Wheat product, Rice product, Maida product will be taken to identify the best diet for obesity people.

$$\tilde{F}_A(E) = \left\{\tilde{F}_A(e_1) = \left\{\begin{matrix}(u_1, 0.7, 0.2), (u_2, 0.4, 0.3), (u_3, 0.5, 0.1) \\ (u_4, 0.8, 0.1)\end{matrix}\right\}\right\}$$

$$\tilde{F}_A(e_2) = \left\{ \begin{matrix} (u_1, 0.6, 0.1), (u_2, 0.3, 0.5), (u_3, 0.1, 0.5), \\ (u_4, 0.8, 0.1) \end{matrix} \right\}$$

$$\tilde{F}_A(e_3) = \left\{ \begin{matrix} (u_1, 0.5, 0.3), (u_2, 0.6, 0.2), (u_3, 0.6, 0.1), \\ (u_4, 0.3, 0.2) \end{matrix} \right\}$$

$$\tilde{G}_B(E) = \left\{ \tilde{G}_B(e_1) = \left\{ \begin{matrix} (u_1, 0.6, 0.3), (u_2, 0.5, 0.2), (u_3, 045, 0.2) \\ (u_4, 0.6, 0.1) \end{matrix} \right\} \right\}$$

$$\tilde{G}_B(e_2) = \left\{ \begin{matrix} (u_1, 0.5, 0.4), (u_2, 0.5, 0.2), (u_3, 0.8, 0.1), \\ (u_4, 0.3, 0.6) \end{matrix} \right\}$$

$$\tilde{G}_B(e_3) = \left\{ \begin{matrix} (u_1, 0.4, 0.2), (u_2, 0.7, 0.1), (u_3, 0.5, 0.5), \\ (u_4, 0.2, 0.7) \end{matrix} \right\}$$

These two intuitionistic fuzzy soft sets are represented by the following intuitionistic fuzzy soft matrices respectively.

$$\tilde{A} = \begin{matrix} & e_1 & e_2 & e_3 \\ u_1 & (0.7,0.2) & (0.6,0.1) & (0.5,0.3) \\ u_2 & (0.4,0.3) & (0.3,0.5) & (0.6,0.2) \\ u_3 & (0.5,0.1) & (0.1,0.5) & (0.6,0.1) \\ u_4 & (0.5,0.2) & (0.8,0.1) & (0.3,0.2) \end{matrix}$$

$$\tilde{B} = \begin{matrix} & e_1 & e_2 & e_3 \\ u_1 & (0.6,0.3) & (0.5,0.4) & (0.4,0.2) \\ u_2 & (0.5,0.2) & (0.5,0.2) & (0.7,0.1) \\ u_3 & (0.4,0.2) & (0.8,0.1) & (0.5,0.5) \\ u_4 & (0.6,0.1) & (0.3,0.6) & (0.2,0.7) \end{matrix}$$

Then the intuitionistic fuzzy soft complement matrices are

$$\tilde{A}^0 = \begin{matrix} & e_1 & e_2 & e_3 \\ u_1 & (0.2,0.7) & (0.1,0.6) & (0.3,0.5) \\ u_2 & (0.3,0.4) & (0.5,0.3) & (0.2,0.6) \\ u_3 & (0.1,0.5) & (0.5,0.1) & (0.1,0.6) \\ u_4 & (0.2,0.5) & (0.1,0.8) & (0.2,0.3) \end{matrix}$$

$$\tilde{B}^0 = \begin{matrix} & e_1 & e_2 & e_3 \\ u_1 & (0.3,0.6) & (0.4,0.5) & (0.2,0.4) \\ u_2 & (0.2,0.5) & (0.2,0.5) & (0.1,0.7) \\ u_3 & (0.2,0.4) & (0.1,0.8) & (0.5,0.5) \\ u_4 & (0.1,0.6) & (0.6,0.3) & (0.7,0.2) \end{matrix}$$

Then the addition Matrices are

$$\tilde{A} + \tilde{B} = \begin{matrix} & e_1 & e_2 & e_3 \\ u_1 & (0.7,0.2) & (0.6,0.1) & (0.5,0.3) \\ u_2 & (0.5,0.2) & (0.5,0.2) & (0.7,0.1) \\ u_3 & (0.5,0.1) & (0.8,0.1) & (0.6,0.1) \\ u_4 & (0.6,0.1) & (0.8,0.1) & (0.3,0.2) \end{matrix}$$

$$\tilde{A}^0 + \tilde{B}^0 = \begin{matrix} & e_1 & e_2 & e_3 \\ u_1 & (0.3,0.6) & (0.4,0.5) & (0.3,0.5) \\ u_2 & (0.3,0.4) & (0.5,0.3) & (0.2,0.6) \\ u_3 & (0.2,0.4) & (0.5,0.1) & (0.5,0.5) \\ u_4 & (0.2,0.5) & (0.6,0.3) & (0.7,0.2) \end{matrix}$$

$$V(\tilde{A} + \tilde{B}) = \begin{matrix} & e_1 & e_2 & e_3 \\ u_1 & 0.5 & 0.5 & 0.2 \\ u_2 & 0.3 & 0.3 & 0.6 \\ u_3 & 0.4 & 0.7 & 0.5 \\ u_4 & 0.5 & 0.7 & 0.1 \end{matrix}$$

$$V(\tilde{A}^0 + \tilde{B}^0) = \begin{matrix} & e_1 & e_2 & e_3 \\ u_1 & -0.3 & -0.1 & -0.2 \\ u_2 & -0.1 & 0.2 & -0.4 \\ u_3 & -0.2 & 0.4 & 0.0 \\ u_4 & -0.3 & 0.3 & 0.5 \end{matrix}$$

$$V(\tilde{A} + \tilde{B}) = \begin{matrix} & e_1 & e_2 & e_3 \\ u_1 & 0.5 & 0.5 & 0.2 \\ u_2 & 0.3 & 0.3 & 0.6 \\ u_3 & 0.4 & 0.7 & 0.5 \\ u_4 & 0.5 & 0.7 & 0.1 \end{matrix}$$

$$V(\tilde{A}^0 + \tilde{B}^0) = \begin{matrix} & e_1 & e_2 & e_3 \\ u_1 & -0.3 & -0.1 & -0.2 \\ u_2 & -0.1 & 0.2 & -0.4 \\ u_3 & -0.2 & 0.4 & 0.0 \\ u_4 & -0.3 & 0.3 & 0.5 \end{matrix}$$

$$S\left((\tilde{A} + \tilde{B}), (\tilde{A}^0 + \tilde{B}^0)\right) = \begin{matrix} & e_1 & e_2 & e_3 \\ u_1 & 0.8 & 0.6 & 0.4 \\ u_2 & 0.4 & 0.1 & 1.0 \\ u_3 & 0.6 & 0.3 & 0.5 \\ u_4 & 0.8 & 0.4 & -0.4 \end{matrix}$$

$$\text{Total Score for the best diet} \quad \begin{matrix} S_1 & 1.8 \\ S_2 & 1.5 \\ S_3 & 1.4 \\ S_4 & 0.8 \end{matrix}$$

We know that S_1 has the maximum value and the obesity people who ate wheat is the best diet for the obesity people. The obesity people u_1 is selected as best diet.

6. Conclusion

wheat has a natural ability to control weight in everyone, but this ability is more pronounced among women. The American Journal of clinical nutrition has shown through research whole wheat rather than refined form is a good choice for obese patients. Women who consumed whole wheat products over long periods showed considerably more weight loss than the others.

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