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Fuzzy Parameterized Complex Multi-Fuzzy Soft Expert Set in Prediction of Coronary Artery Disease

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Abstract.

In this work, state the risk and treatment of coronary artery disease our aim. The weighted fuzzy parameterized complex multi-fuzzy soft expert set plays the main roads to arrive a maple treatment. We take a reality values of the a asymptotes systolic blood pressure, lowdensity lipoprotein cholesterol, maximum heart rate, blood sugar, old peak and age of nine patients and transform by FORTRAN program to weighted fuzzy parameterized complex multifuzzy soft expert set. By Kong algorithm state the positive and negative decision, from these decisions state the degree of risk and treatments. Our decision helps the hospital doctor to state the treatments drug therapy or intervention.

Keywords: Fuzzy Parameterized Complex Multi-Fuzzy Soft Expert Set, positive and negative decision, Coronary Artery Disease

AMS Classification: 03E72, 47S40

1-Introduction and Preliminaries

Nearly normal**,** I hearing this stamen in the hospital. May be causes for me some trouble. Why nearly norm this is disease and I need reality treatments. How under the meaning of this statement. So where is the mathematics with reality values. I am still in the hospital to choose a disease and take a reality value of the asymptotes, the doctor in the hospital help me take coronary artery disease. Many of patients here suffer from this disease. Yes Okay. I setting in the hospital with doctor and taken the reality values of asymptotes systolic blood pressure, low-density lipoprotein cholesterol, maximum heart rate, blood sugar, old peak and age of nine patients. The next step transform these data to fuzzy sets (FSs) theory [1], and multi-fuzzy sets (MFSs) theory [2,3,4] have been built. Although insufficiency of parameterization tools. In [5,6] examples of fuzzy hybrids used in decision-making. Molodtsov [7] introduced the theory of soft sets to manage the uncertainties in parameterized form. The applications probability theory, probability theory, game theory, intelligent systems, information sciences in our hands now and open the way to another application in medicine to solve our problem (Try to state a degree of risk and a treatments of coronary artery disease). Also, because a different opinions between a doctors we gone to fuzzy parameterized complex multi-fuzzy soft expert set, this set give us a positive and negative decision. In [13] Alkhazaleh and Salleh, investigated the theory of soft expert sets, which later broadened to a fuzzy soft expert set theory [14], a bipolar fuzzy soft expert set [15], a multi Q-fuzzy soft expert set [16], and a set [neutrosophic soft expert 17,18]. In [19,20] Ramot, used complex fuzzy sets (CFS) to better design and model the real-life applications. A simultaneously complex fuzzy sets (CFS) is clear to explain the uncertainty and periodicity features of an object together in a single set. In [21,22] theories and applications for complex fuzzy sets (CFS),

Al-Qudah and Hassan [23,24,25,26,27,28,29] based on [3,19] introduced a hybrid model of complex multi-fuzzy set (CMFS). This model seems handy in managing difficulties associated with multidimensional characterization properties. In [30-35] fuzzy parameterized soft sets, intuitionistic fuzzy parameterized soft sets and their generalizations are studied. this study can be summarized as below:

1. Firstly, we give an example of fuzzy parameterized fuzzy soft expert set,

2. Fuzzy parameterized fuzzy soft expert set is used to put forth an algorithm on decision-making,

3. Lastly, By Kong algorithm state the positive and negative decision, from these decisions states the degree of risk and treatments.

Section 2 denotes preliminaries and basic definitions. while Section 3 presents the proposed methodology and implementation, . In Section 4, Problem statements of the patients of coronary artery disease and an application a decision-making are discussed. In this section too, devoted to weighted fuzzy parameterized complex multi-fuzzy soft expert set based on decision-making, a comparison our decision and the decision by doctor in the hospital are studied, Finally, Section 5 is the conclusion with suggestion for further studies.

2. Preliminaries and Basic Definitions

Definition 2.1 [39] Let k denote a positive integer and U represent a universe of set, E denotes a set of parameters, $I^Z(E)$ represents all fuzzy subset of E, X represents a set of experts (agents), , and $\mathcal{O}$ = { 1 = agree, 0 = disagree } a set of opinions. Let $Z = \varphi \times X \times \mathcal{O}$ and $A \subseteq Z$, where $\varphi \subset I^Z(E)$. The pair $(f, A)_\varphi$ is called an of dimension k (FP- M^kFSES) over U, where f is a mapping expressed $f_\varphi: A \to M^kF(U)$ where $M^kF(U)$ represents the collections of all multi-fuzzy subsets of U.

Definition 2.2 [39] Let k denote a positive integer and U represent a universe of elements, E denotes a set of parameters, $I^Z(E)$ represents the set of fuzzy subset of E, X denotes a set of experts, and $\mathcal{O}$ = { 1 = agree, 0 = disagree } a set of opinions. Let $Z = Y \times X \times \mathcal{O}$ and $A \subseteq Z$ where $Y \subset I^Z(E)$. Then, the pair $(f, A)_Y$ is known as fuzzy parameterized complex multi-fuzzy soft expert set of dimension k (FP- CM^kFSES) over U if and if only $f_Y: A \to CM^k(U)$ is a mapping into the set of all complex multi-fuzzy sets in U. The $FP\text{-}CM^kFSES$ $(f,A)_Y$ can be written as a following set of ordered pairs:

$$(f,A)_Y=\left\{\left(\sigma=\left[\frac{\eta_Y(e)}{e},x,0\right],\left\{\frac{f_Y(\sigma)(u)}{u}:u\in U\right\}\right):\sigma\in A\subseteq Y\times X\times \mathcal{O},e\in E,x\in X\ and\ 0\in \mathcal{O}\right\},$$

Such that $\eta_Y(e)$ is the corresponding membership function of the fuzzy set Y and $f_Y(\sigma)(u)=\left[\mu_{f_Y(\sigma)}(u)=r^j{}_{f_Y(\sigma)}(u).e^{i\omega^j{}_{f_Y(\sigma)}(u)}\right],\forall u\in U$ and $j=1,2,3,\ldots,k$ for the $FP\text{-}CM^kFSES$ $(f,A)_Y$. The values of $\left[\mu_{f_Y(\sigma)}(u)\right]$ May all lie within the unit circle in the complex plan, and are thus of the form $\left[\mu_{f_Y(\sigma)}(u)=r^j{}_{f_Y(\sigma)}(u).e^{i\omega^j{}_{f_Y(\sigma)}(u)}\right]$, where $i=\sqrt{-1}$ each of the amplitude terms $\left[r^j{}_{f_Y(e)}(u)\right]$ and the phase terms $\left[\omega^j{}_{f_Y(\sigma)}(u)\right]$ Are both real-valued, and $\left[r^j{}_{f_Y(\sigma)}(u)\right]\in[0,1],\forall\{j=1,2,3,\ldots,k\}$. The set of all $FP\text{-}CMFSES$ of all dimension k in U are denotes by $FP\text{-}CM^kFSES(U)$. It follows that, letting U denote a universe of elements, , E denotes a set of parameters, and let $(f,A)_Y$, $(g,\mathcal{B})_\hbar$, $(\mathcal{L},\mathcal{D})_\lambda\in FP\text{-}CM^kFSES(U)$ which is defined as below:

$$(f,A)_Y=\left\{\left(\sigma=\left[\frac{\eta_Y(e)}{e},x,0\right],\left\{\frac{f_Y(\sigma)(u)}{u}:u\in U\right\}\right):\sigma\in A\subseteq Y\times X\times \mathcal{O},e\in E,x\in X\ and\ 0\in \mathcal{O}\right\}$$

$$(g,\mathcal{B})_\hbar=\left\{\left(\sigma=\left[\frac{\eta_\hbar(e)}{e},x,0\right],\left\{\frac{g_\hbar(\sigma)(u)}{u}:u\in U\right\}\right):\sigma\in A\subseteq \hbar\times X\times \mathcal{O},e\in E,x\in X\ and\ 0\in \mathcal{O}\right\}$$

$$(\mathcal{L},\mathcal{D})_\lambda=\left\{\left(\sigma=\left[\frac{\eta_\lambda(e)}{e},x,0\right],\left\{\frac{\mathcal{L}_\lambda(\sigma)(u)}{u}:u\in U\right\}\right):\sigma\in A\subseteq \lambda\times X\times \mathcal{O},e\in E,x\in X\ and\ 0\in \mathcal{O}\right\}$$

The following example explained these notions.

Example 2.1 Let $U=\{u_1,u_2\}$ be a universe set,

$$E=\left\{\begin{matrix}e_1(\text{systolic blood pressure}),e_2(\text{Cholesterol}),e_3(\text{Maximum heart rate}),\\ e_4(\text{Blood sugar}),e_5(\text{old peak}),e_6\ (\text{Age})\end{matrix}\right\}$$

Is a set of symptoms of coronary artery disease and $X=\{x_1,x_2\}$ be two expert doctors. If $Y=\left\{\frac{0.88}{e_1},\frac{0.86}{e_2},\frac{0.81}{e_3},\frac{0.9}{e_4},\frac{0.8}{e_5},\frac{0.7}{e_6}\right\}$ is as subset of $I^Z(E)$, then $f_Y(\sigma)(u)$ is a complex multi-fuzzy soft expert set of dimention three defined as follows :

$$\mathrm{f_Y(e_1, x_1, 1)(u)} = \left\{\frac{0.2e^{i2\pi(1/4)}, \quad 0.4e^{i2\pi(2/4)}, \quad 0.3e^{i2\pi(3/4)}}{u_1}, \frac{0.1e^{i2\pi(4/4)}, \quad 0.3e^{i2\pi(3/4)}, \quad 0.5e^{i2\pi(2/4)}}{u_2}\right\}$$

$$\mathrm{f_Y(e_1, x_2, 1)(u)} = \left\{\frac{0.7e^{i2\pi(3/4)}, \quad 0.1e^{i2\pi(4/4)}, \quad 0.3e^{i2\pi(1/4)}}{u_1}, \frac{0.5e^{i2\pi(1/4)}, \quad 0.2e^{i2\pi(2/4)}, \quad 0.3e^{i2\pi(4/4)}}{u_2}\right\}$$

$$\mathrm{f_Y(e_2, x_1, 1)(u)} = \left\{\frac{0.3e^{i2\pi(1/4)}, \quad 0.2e^{i2\pi(3/4)}, \quad 0.6e^{i2\pi(2/4)}}{u_1}, \frac{0.1e^{i2\pi(1/4)}, \quad 0.3e^{i2\pi(3/4)}, \quad 0.6e^{i2\pi(4/4)}}{u_2}\right\}$$

$$\mathrm{f_Y(e_2, x_2, 1)(u)} = \left\{\frac{0.1e^{i2\pi(1/5)}, \quad 0.3e^{i2\pi(2/5)}, \quad 0.7e^{i2\pi(5/5)}}{u_1}, \frac{0.2e^{i2\pi(2/5)}, \quad 0.8e^{i2\pi(4/5)}, \quad 0.9e^{i2\pi(3/5)}}{u_2}\right\}$$

$$\mathrm{f_Y(e_3, x_1, 1)(u)} = \left\{\frac{0.3e^{i2\pi(1/7)}, \quad 0.1e^{i2\pi(2/7)}, \quad 0.6e^{i2\pi(3/7)}}{u_1}, \frac{0.8e^{i2\pi(3/7)}, \quad 0.7e^{i2\pi(5/7)}, \quad 0.2e^{i2\pi(1/7)}}{u_2}\right\}$$

$$\mathrm{f_Y(e_3, x_2, 1)(u)} = \left\{\frac{0.6e^{i2\pi(1/4)}, \quad 0.3e^{i2\pi(3/4)}, \quad 0.5e^{i2\pi(4/4)}}{u_1}, \frac{0.8e^{i2\pi(1/4)}, \quad 0.7e^{i2\pi(3/4)}, \quad 0.1e^{i2\pi(2/4)}}{u_2}\right\}$$

$$\mathrm{f_Y(e_4, x_1, 1)(u)} = \left\{\frac{0.1e^{i2\pi(4/6)}, \quad 0.4e^{i2\pi(5/6)}, \quad 0.6e^{i2\pi(2/6)}}{u_1}, \frac{0.8e^{i2\pi(1/6)}, \quad 0.9e^{i2\pi(6/6)}, \quad 0.1e^{i2\pi(3/6)}}{u_2}\right\}$$

$$\mathrm{f_Y(e_4, x_2, 1)(u)} = \left\{\frac{0.1e^{i2\pi(1/4)}, \quad 0.3e^{i2\pi(2/4)}, \quad 0.6e^{i2\pi(3/4)}}{u_1}, \frac{0.6e^{i2\pi(4/4)}, \quad 0.3e^{i2\pi(3/4)}, \quad 0.3e^{i2\pi(4/4)}}{u_2}\right\}$$

$$\mathrm{f_Y(e_5, x_1, 1)(u)} = \left\{\frac{0.2e^{i2\pi(2/5)}, \quad 0.4e^{i2\pi(3/5)}, \quad 0.5e^{i2\pi(1/5)}}{u_1}, \frac{0.6e^{i2\pi(4/5)}, \quad 0.2e^{i2\pi(5/5)}, \quad 0.3e^{i2\pi(2/5)}}{u_2}\right\}$$

$$\mathrm{f_Y(e_5, x_2, 1)(u)} = \left\{\frac{0.3e^{i2\pi(1/4)}, \quad 0.4e^{i2\pi(3/4)}, \quad 0.7e^{i2\pi(4/4)}}{u_1}, \frac{0.8e^{i2\pi(2/4)}, \quad 0.1e^{i2\pi(2/4)}, \quad 0.1e^{i2\pi(1/4)}}{u_2}\right\}$$

$$\mathrm{f_Y(e_6, x_1, 1)(u)} = \left\{\frac{0.1e^{i2\pi(3/4)}, \quad 0.2e^{i2\pi(4/4)}, \quad 0.6e^{i2\pi(2/4)}}{u_1}, \frac{0.8e^{i2\pi(3/4)}, \quad 0.4e^{i2\pi(2/4)}, \quad 0.5e^{i2\pi(1/4)}}{u_2}\right\}$$

$$\mathrm{f_Y(e_6, x_2, 1)(u)} = \left\{\frac{0.2e^{i2\pi(3/7)}, \quad 0.3e^{i2\pi(1/7)}, \quad 0.6e^{i2\pi(2/7)}}{u_1}, \frac{0.5e^{i2\pi(5/7)}, \quad 0.7e^{i2\pi(6/7)}, \quad 0.8e^{i2\pi(7/7)}}{u_2}\right\}$$

$$\mathrm{f_Y(e_1, x_1, 0)(u)} = \left\{\frac{0.4e^{i2\pi(1/4)}, \quad 0.5e^{i2\pi(3/4)}, \quad 0.6e^{i2\pi(2/4)}}{u_1}, \frac{0.7e^{i2\pi(3/4)}, \quad 0.8e^{i2\pi(2/4)}, \quad 0.4e^{i2\pi(4/4)}}{u_2}\right\}$$

$$\mathrm{f_Y(e_1, x_2, 0)(u)} = \left\{\frac{0.9e^{i2\pi(1/4)}, \quad 0.2e^{i2\pi(1/4)}, \quad 0.3e^{i2\pi(3/4)}}{u_1}, \frac{0.5e^{i2\pi(3/4)}, \quad 0.6e^{i2\pi(4/4)}, \quad 0.1e^{i2\pi(2/4)}}{u_2}\right\}$$

$$\mathrm{f_Y(e_2, x_1, 0)(u)} = \left\{\frac{0.2e^{i2\pi(2/4)}, \quad 0.3e^{i2\pi(3/4)}, \quad 0.4e^{i2\pi(4/4)}}{u_1}, \frac{0.1e^{i2\pi(2/4)}, \quad 0.3e^{i2\pi(3/4)}, \quad 0.5e^{i2\pi(1/4)}}{u_2}\right\}$$

$$\mathrm{f_Y(e_2, x_2, 0)(u)} = \left\{\frac{0.6e^{i2\pi(3/4)}, \quad 0.2e^{i2\pi(2/4)}, \quad 0.1e^{i2\pi(3/4)}}{u_1}, \frac{0.2e^{i2\pi(4/4)}, \quad 0.3e^{i2\pi(1/4)}, \quad 0.3e^{i2\pi(3/4)}}{u_2}\right\}$$

$$f_Y(e_3, x_1, 0)(u) = \left\{\frac{0.1e^{i2\pi(5/6)},\ 0.2e^{i2\pi(3/6)},\ 0.4e^{i2\pi(5/6)}}{u_1}, \frac{0.5e^{i2\pi(2/6)},\ 0.6e^{i2\pi(3/6)},\ 0.7e^{i2\pi(1/6)}}{u_2}\right\}$$

$$f_Y(e_3, x_2, 0)(u) = \left\{\frac{0.3e^{i2\pi(2/4)},\ 0.3e^{i2\pi(3/4)},\ 0.5e^{i2\pi(4/4)}}{u_1}, \frac{0.3e^{i2\pi(1/4)},\ 0.4e^{i2\pi(3/4)},\ 0.5e^{i2\pi(3/4)}}{u_2}\right\}$$

$$f_Y(e_4, x_1, 0)(u) = \left\{\frac{0.4e^{i2\pi(1/6)},\ 0.5e^{i2\pi(2/6)},\ 0.4e^{i2\pi(1/6)}}{u_1}, \frac{0.6e^{i2\pi(3/6)},\ 0.4e^{i2\pi(5/6)},\ 0.5e^{i2\pi(1/6)}}{u_2}\right\}$$

$$f_Y(e_4, x_2, 0)(u) = \left\{\frac{0.5e^{i2\pi(1/5)},\ 0.2e^{i2\pi(3/5)},\ 0.3e^{i2\pi(4/5)}}{u_1}, \frac{0.3e^{i2\pi(5/5)},\ 0.2e^{i2\pi(1/5)},\ 0.1e^{i2\pi(4/5)}}{u_2}\right\}$$

$$f_Y(e_5, x_1, 0)(u) = \left\{\frac{0.6e^{i2\pi(1/4)},\ 0.7e^{i2\pi(2/4)},\ 0.8e^{i2\pi(3/4)}}{u_1}, \frac{0.2e^{i2\pi(4/4)},\ 0.3e^{i2\pi(2/4)},\ 0.4e^{i2\pi(2/4)}}{u_2}\right\}$$

$$f_Y(e_5, x_2, 0)(u) = \left\{\frac{0.7e^{i2\pi(1/4)},\ 0.3e^{i2\pi(2/4)},\ 0.4e^{i2\pi(3/4)}}{u_1}, \frac{0.7e^{i2\pi(1/4)},\ 0.1e^{i2\pi(2/4)},\ 0.2e^{i2\pi(3/4)}}{u_2}\right\}$$

$$f_Y(e_6, x_1, 0)(u) = \left\{\frac{0.8e^{i2\pi(1/3)},\ 0.8e^{i2\pi(2/3)},\ 0.3e^{i2\pi(1/3)}}{u_1}, \frac{0.3e^{i2\pi(3/3)},\ 0.2e^{i2\pi(2/3)},\ 0.5e^{i2\pi(1/3)}}{u_2}\right\}$$

$$f_Y(e_6, x_2, 0)(u) = \left\{\frac{0.4e^{i2\pi(2/4)},\ 0.4e^{i2\pi(3/4)},\ 0.9e^{i2\pi(4/4)}}{u_1}, \frac{0.1e^{i2\pi(1/4)},\ 0.5e^{i2\pi(2/4)},\ 0.6e^{i2\pi(1/4)}}{u_2}\right\}$$

3. The Proposed Methodology and Implementation

Classification of systolic blood pressure, the degree blood pressure of normal man between 120 – 170 so if the blood pressure of this man is 134 is low degree and 154 is high degree, we can transform these degree to fuzzy form by divide any degree by 170, for example

Types of diseases	Degree	Fuzzy sets values
Classification of systolic blood pressure	120	$\frac{120}{170} = 0.70$
	137	$\frac{144}{170} = 0.80$
	160	$\frac{160}{170} = 0.94$
	170	$\frac{170}{170} = 1.00$

Table 1 transforms the data to fuzzy form

By the same fashion Classification of cholesterol, maximum heart rate, blood sugar, old peak and age and transform these degree to fuzzy form by divide any degree by high degree , for example

Types of diseases	Degree	Fuzzy sets values
Classification of Cholesterol	197	$\frac{197}{300} = 0.65$
	210	$\frac{210}{300} = 0.70$
	260	$\frac{260}{300} = 0.86$
	300	$\frac{300}{300} = 1.00$

Follow Table 1 transforms the data to fuzzy form

Types of diseases	Degree	Fuzzy sets values
Classification of Maximum heart rate	135	$\frac{135}{220} = 0.61$
	180	$\frac{180}{220} = 0.81$
	190	$\frac{190}{220} = 0.86$
	220	$\frac{220}{220} = 1.00$

Follow Table 1 transforms the data to fuzzy form

Types of diseases	Degree	Fuzzy sets values
Classification of Blood sugar	100	$\frac{120}{133} = 0.90$
	112	$\frac{112}{133} = 0.84$
	120	$\frac{120}{133} = 0.90$
	133	$\frac{133}{133} = 1.00$

Follow Table 1 transforms the data to fuzzy form

Types of diseases	Degree	Fuzzy sets values
Classification of old peak	2.0	$\frac{2.0}{4} = 0.50$
	2.8	$\frac{2.8}{4} = 0.70$
	3.2	$\frac{3.2}{4} = 0.80$
	4	$\frac{4}{4} = 1.00$

Follow Table 1 transforms the data to fuzzy form

Types of diseases	Degree	Fuzzy sets values
Classification of Age	20	$\frac{20}{70} = 0.28$
	40	$\frac{40}{70} = 0.57$
	50	$\frac{50}{70} = 0.71$
	70	$\frac{70}{70} = 1.00$

Follow Table 1 transforms the data to fuzzy form

Let study a nine patient have the following reality data as a symptoms of coronary artery disease the first and nine patients take the lower and higher values of symptoms. Our aims study all cases by fuzzy parameterized complex multi-fuzzy soft expert set and state the risk of the patient and type of treatments, so first, explain a famous possibility a symptoms of coronary artery disease and take only one reality value of a symptoms for all patients. The following table 1 explain The four reality values state the case Low (L), Medium (M), High (H) and Very high (VH) of coronary artery . Table 1 explain the reality values of a symptoms of coronary artery disease

P	Blood pressure	Cholesterol	Maximum heart rate
p_1	$\{120, 137, 160, 170\}$	$\{197, 210, 260, 300\}$	$\{135, 180, 190, 220\}$
p_2	$\{133, 155, 166, 169\}$	$\{110, 137, 160, 220\}$	$\{120, 137, 170, 200\}$
p_3	$\{125, 157, 150, 167\}$	$\{197, 210, 260, 300\}$	$\{144, 177, 190, 200\}$
p_4	$\{110, 147, 150, 166\}$	$\{130, 147, 160, 190\}$	$\{120, 147, 160, 170\}$
p_5	$\{90, 120, 140, 150\}$	$\{200, 210, 250, 270\}$	$\{130, 157, 160, 210\}$
p_6	$\{110, 120, 160, 170\}$	$\{210, 237, 260, 270\}$	$\{135, 167, 190, 200\}$
p_7	$\{140, 157, 160, 166\}$	$\{220, 247, 260, 280\}$	$\{139, 167, 200, 210\}$
p_8	$\{130, 147, 160, 166\}$	$\{190, 210, 260, 270\}$	$\{138, 188, 210, 215\}$
p_9	$\{100, 127, 130, 160\}$	$\{180, 200, 260, 290\}$	$\{140, 180, 200, 210\}$

Table 2: explain the reality values of a symptoms of coronary artery disease for

Nine male patient

P	Blood sugar	Old peak	Age
p_1	$\{100, 112, 120, 133\}$	$\{2.0, 2.8, 3.2, 4.0\}$	$\{20, 40, 50, 70\}$
p_2	$\{120, 130, 131, 132\}$	$\{2.0, 2.2, 3.2, 3.9\}$	$\{20, 37, 60, 70\}$
p_3	$\{100, 105, 110, 120\}$	$\{2.0, 2.2, 3.4, 3.6\}$	$\{30, 37, 50, 70\}$
p_4	$\{90, 110, 122, 132\}$	$\{2.1, 2.4, 3.2, 4.0\}$	$\{40, 57, 60, 70\}$
p_5	$\{100, 107, 120, 125\}$	$\{2.0, 2.9, 3.2, 4.0\}$	$\{20, 40, 55, 65\}$
p_6	$\{110, 127, 130, 133\}$	$\{1.8, 2.8, 3.1, 4.0\}$	$\{30, 36, 55, 70\}$
p_7	$\{100, 125, 130, 133\}$	$\{2.0, 2.3, 3.2, 3.7\}$	$\{20, 37, 40, 50\}$
p_8	$\{110, 117, 120, 130\}$	$\{2.4, 2.8, 3.7, 4.0\}$	$\{20, 40, 60, 65\}$
p_9	$\{100, 101, 115, 120\}$	$\{2.0, 2.2, 3.2, 4.0\}$	$\{22, 37, 60, 70\}$

Follows table 2: explain the reality values of symptoms of coronary artery disease for

Nine male patients

Now our aim is arrive by this data about symptoms of coronary artery disease to fuzzy form so we divide all values by the higher values. And distribute the degree to four fuzzy sets form are Low (L), Medium (M), High (H) and Very high (VH). Table 2 explain the four fuzzy sets are Low (L), Medium (M), High (H) and Very high (VH). Table 2 explained the data of the patients in fuzzy form

P	Blood pressure	Cholesterol	Maximum heart rate	Blood sugar	Old peak	Age
p_1	$\begin{cases}0.70\\0.80\\0.94\\1.00\end{cases}$	$\begin{cases}0.65\\0.70\\0.86\\1.00\end{cases}$	$\begin{cases}0.61\\0.81\\0.86\\1.00\end{cases}$	$\begin{cases}0.75\\0.84\\0.90\\1.00\end{cases}$	$\begin{cases}0.50\\0.70\\0.80\\1.00\end{cases}$	$\begin{cases}0.38\\0.57\\0.71\\1.00\end{cases}$
p_2	$\begin{cases}0.78\\0.91\\0.97\\0.99\end{cases}$	$\begin{cases}0.36\\0.45\\0.53\\0.73\end{cases}$	$\begin{cases}0.54\\0.62\\0.77\\0.90\end{cases}$	$\begin{cases}0.90\\0.97\\0.98\\0.99\end{cases}$	$\begin{cases}0.50\\0.55\\0.94\\0.97\end{cases}$	$\begin{cases}0.38\\0.53\\0.85\\1.00\end{cases}$
p_3	$\begin{cases}0.73\\0.92\\0.88\\0.89\end{cases}$	$\begin{cases}0.65\\0.70\\0.86\\1.00\end{cases}$	$\begin{cases}0.65\\0.80\\0.86\\0.90\end{cases}$	$\begin{cases}0.75\\0.78\\0.82\\0.90\end{cases}$	$\begin{cases}0.50\\0.55\\0.85\\0.90\end{cases}$	$\begin{cases}0.43\\0.53\\0.71\\1.00\end{cases}$
p_4	$\begin{cases}0.64\\0.86\\0.88\\0.97\end{cases}$	$\begin{cases}0.43\\0.49\\0.53\\0.63\end{cases}$	$\begin{cases}0.54\\0.66\\0.72\\0.77\end{cases}$	$\begin{cases}0.67\\0.82\\0.91\\0.99\end{cases}$	$\begin{cases}0.52\\0.60\\0.80\\1.00\end{cases}$	$\begin{cases}0.57\\0.81\\0.85\\1.00\end{cases}$
p_5	$\begin{cases}0.52\\0.70\\0.82\\0.88\end{cases}$	$\begin{cases}0.66\\0.70\\0.83\\0.90\end{cases}$	$\begin{cases}0.59\\0.62\\0.77\\0.95\end{cases}$	$\begin{cases}0.75\\0.80\\0.90\\0.92\end{cases}$	$\begin{cases}0.50\\0.72\\0.80\\1.00\end{cases}$	$\begin{cases}0.38\\0.57\\0.78\\0.92\end{cases}$

p_6	$\begin{cases}0.64\\0.70\\0.94\\1.00\end{cases}$	$\begin{cases}0.70\\0.97\\0.86\\0.90\end{cases}$	$\begin{cases}0.61\\0.75\\0.86\\1.00\end{cases}$	$\begin{cases}0.82\\0.95\\0.97\\1.00\end{cases}$	$\begin{cases}0.45\\0.70\\0.77\\1.00\end{cases}$	$\begin{cases}0.43\\0.51\\0.78\\1.00\end{cases}$
p_7	$\begin{cases}0.82\\0.92\\0.94\\0.97\end{cases}$	$\begin{cases}0.73\\0.82\\0.86\\0.93\end{cases}$	$\begin{cases}0.63\\0.75\\0.90\\0.95\end{cases}$	$\begin{cases}0.75\\0.92\\0.97\\1.00\end{cases}$	$\begin{cases}0.50\\0.57\\0.80\\0.92\end{cases}$	$\begin{cases}0.38\\0.53\\0.57\\0.71\end{cases}$
p_8	$\begin{cases}0.76\\0.86\\0.94\\0.97\end{cases}$	$\begin{cases}0.63\\0.70\\0.86\\0.90\end{cases}$	$\begin{cases}0.62\\0.85\\0.95\\0.97\end{cases}$	$\begin{cases}0.82\\0.87\\0.90\\0.97\end{cases}$	$\begin{cases}0.60\\0.70\\0.92\\1.00\end{cases}$	$\begin{cases}0.32\\0.57\\0.85\\0.92\end{cases}$
p_9	$\begin{cases}0.58\\0.74\\0.76\\0.94\end{cases}$	$\begin{cases}0.60\\0.66\\0.86\\0.96\end{cases}$	$\begin{cases}0.63\\0.81\\0.90\\0.95\end{cases}$	$\begin{cases}0.75\\0.75\\0.86\\0.90\end{cases}$	$\begin{cases}0.50\\0.55\\0.80\\1.00\end{cases}$	$\begin{cases}0.31\\0.53\\0.85\\1.00\end{cases}$

Table 3: The data of the patients in fuzzy form

4. Problem statements of the patients of coronary artery disease

In this part transform the data to Fuzzy Parameterized Complex Multi-Fuzzy Soft Expert Set (FP- CM^kFSES), so Let the Fuzzy Parameterized Complex Multi-Fuzzy Soft Expert Set (FP- CM^kFSES) for all the parameters of symptoms of coronary artery disease, Let

$U = \{p_1, p_2, p_3, p_4, p_5, p_6, p_7, p_8, p_9\}$ is a set of nine of the patients of coronary artery disease, have the reality values of symptoms e_1(systolic blood pressure), e_2(Cholesterol),

e_3(Maximum heart rate), e_4(Blood sugar), e_5(old peak), e_6 (Age). And x be expert doctor.

The subset of parameters is $Y = \left\{\frac{0.30}{e_1}, \frac{0.33}{e_2}, \frac{0.21}{e_3}, \frac{0.25}{e_4}, \frac{0.8}{e_5}, \frac{0.25}{e_6}, \frac{0.20}{e_7}, \frac{0.31}{e_8}, \frac{0.21}{e_9}\right\}$, then by expert doctor x to state the values of symptoms. The Following algorism explains by steps the ways to solve this problem.

Algorithm 1: Using $FP\text{-}\ CM^kFSES$

Step 1. State symptoms of coronary artery disease by Fuzzy Parameterized Complex Multi-Fuzzy Soft Expert Set ($FP\text{-}\ CM^kFSES$),

Step 2. State a weigh for the amplitude and phrase terms respectively, to get the weighted aggregation values of $\mu^j{}_{f_Y(\sigma_s)}(u_s), \forall\ \sigma_s \in A\ \forall u \in U$ and $j = 1,2,3, \ldots\ldots, k$ for the $FP\text{-}\ M^kFSES$ $(f, A)_Y$ to transform $FP\text{-}\ CM^kFSES$ to $FP\text{-}\ M^kFSES$

Step 3. Calculate $\mu^j{}_{f_Y(\sigma_1)}(p)$ when $\sigma_1(e_1, x, 1)$ and $j = 1,2,3, \ldots\ldots, k$. Begin by representation of the agree- $FP\text{-}\ M^kFSES$

Step 4. Calculate the values of $C_{ll} = \frac{\sum_{j=1}^{k} \mu^j{}_{f_Y(\sigma_l)}(u_l)}{k}$ $\forall\ \sigma_l \in A\ \forall u_l \in U$ and $j = 1,2,3, \ldots\ldots, k$ For agree- $FP\text{-}\ M^kFSES$ and dis- agree- $FP\text{-}\ M^kFSES$

Step 5. Calculate $R_l = k_l - S_l$ and Proposed Fuzzy Parameterized Complex Multi-Fuzzy Soft Expert Set ($FP\text{-}\ CM^kFSES$)design.

Based on the input, the traveler constructed the $FP\text{-}\ CM^kFSES$ as follows: ($\frac{0.30}{e_1}$ mean that the standard value of systolic blood pressure is 0.30)

$$f_Y\left(\frac{0.30}{e_1}, x, 1\right)(p) = \left\{ \begin{array}{c} \frac{0.75e^{i2\pi(1/4)},\ 0.84e^{i2\pi(2/4)},\ 0.90e^{i2\pi(3/4)},\ 1.0e^{i2\pi(2/4)}}{p_1}, \\ \frac{0.90e^{i2\pi(4/4)},\ 0.97e^{i2\pi(3/4)},\ 0.98e^{i2\pi(2/4)},\ 0.99e^{i2\pi(2/4)}}{p_2}, \\ \frac{0.75e^{i2\pi(4/4)},\ 0.78e^{i2\pi(3/4)},\ 0.82e^{i2\pi(2/4)},\ 0.90e^{i2\pi(2/4)}}{p_3}, \\ \frac{0.67e^{i2\pi(4/4)},\ 0.82e^{i2\pi(3/4)},\ 0.91e^{i2\pi(2/4)},\ 0.99e^{i2\pi(2/4)}}{p_4}, \\ \frac{0.75e^{i2\pi(4/4)},\ 0.80e^{i2\pi(3/4)},\ 0.90e^{i2\pi(2/4)},\ 0.92e^{i2\pi(2/4)}}{p_5}, \\ \frac{0.82e^{i2\pi(4/4)},\ 0.95e^{i2\pi(3/4)},\ 0.97e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_6}, \\ \frac{0.75e^{i2\pi(4/4)},\ 0.92e^{i2\pi(3/4)},\ 0.97e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_7}, \\ \frac{0.82e^{i2\pi(4/4)},\ 0.87e^{i2\pi(3/4)},\ 0.90e^{i2\pi(2/4)},\ 0.97e^{i2\pi(2/4)}}{p_8}, \\ \frac{0.75e^{i2\pi(4/4)},\ 0.75e^{i2\pi(3/4)},\ 0.86e^{i2\pi(2/4)},\ 0.90e^{i2\pi(2/4)}}{p_9} \end{array} \right\}$$

The above statement means by the expert doctor state the symptom systolic blood pressure of all nine patients take the values in four reading. The following statements as same fashion

$$f_Y\left(\frac{0.30}{e_1}, x, 0\right)(p) = \left\{\begin{array}{l} \frac{0.25e^{i2\pi(1/4)},\ 0.24e^{i2\pi(2/4)},\ 0.63e^{i2\pi(3/4)},\ 0.84e^{i2\pi(2/4)}}{p_1}, \\ \frac{0.61e^{i2\pi(4/4)},\ 0.20e^{i2\pi(3/4)},\ 0.55e^{i2\pi(3/4)},\ 0.40e^{i2\pi(2/4)}}{p_2}, \\ \frac{0.44e^{i2\pi(4/4)},\ 0.30e^{i2\pi(3/4)},\ 0.52e^{i2\pi(3/4)},\ 0.34e^{i2\pi(2/4)}}{p_3}, \\ \frac{0.15e^{i2\pi(4/4)},\ 0.83e^{i2\pi(3/4)},\ 0.50e^{i2\pi(2/4)},\ 0.22e^{i2\pi(2/4)}}{p_4}, \\ \frac{0.80e^{i2\pi(4/4)},\ 0.83e^{i2\pi(3/4)},\ 0.45e^{i2\pi(2/4)},\ 0.60e^{i2\pi(2/4)}}{p_5}, \\ \frac{0.44e^{i2\pi(4/4)},\ 0.30e^{i2\pi(3/4)},\ 0.25e^{i2\pi(3/4)},\ 0.46e^{i2\pi(2/4)}}{p_6}, \\ \frac{0.80e^{i2\pi(4/4)},\ 0.30e^{i2\pi(3/4)},\ 0.54e^{i2\pi(4/4)},\ 0.40e^{i2\pi(2/4)}}{p_7}, \\ \frac{0.22e^{i2\pi(4/4)},\ 0.88e^{i2\pi(3/4)},\ 0.44e^{i2\pi(2/4)},\ 0.42e^{i2\pi(2/4)}}{p_8}, \\ \frac{0.15e^{i2\pi(4/4)},\ 0.36e^{i2\pi(3/4)},\ 0.50e^{i2\pi(3/4)},\ 0.25e^{i2\pi(2/4)}}{p_9} \end{array}\right\}$$

$$f_Y\left(\frac{0.33}{e_2}, x, 1\right)(p) = \left\{\begin{array}{l} \frac{0.65e^{i2\pi(1/4)},\ 0.70e^{i2\pi(2/4)},\ 0.86e^{i2\pi(3/4)},\ 1.0e^{i2\pi(2/4)}}{p_1}, \\ \frac{0.36e^{i2\pi(4/4)},\ 0.45e^{i2\pi(3/4)},\ 0.53e^{i2\pi(2/4)},\ 0.73e^{i2\pi(2/4)}}{p_2}, \\ \frac{0.65e^{i2\pi(4/4)},\ 0.70e^{i2\pi(3/4)},\ 0.86e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_3}, \\ \frac{0.43e^{i2\pi(4/4)},\ 0.99e^{i2\pi(3/4)},\ 0.53e^{i2\pi(2/4)},\ 0.63e^{i2\pi(2/4)}}{p_4}, \\ \frac{0.66e^{i2\pi(4/4)},\ 0.70e^{i2\pi(3/4)},\ 0.83e^{i2\pi(2/4)},\ 0.90e^{i2\pi(2/4)}}{p_5}, \\ \frac{0.70e^{i2\pi(4/4)},\ 0.79e^{i2\pi(3/4)},\ 0.86e^{i2\pi(2/4)},\ 0.90e^{i2\pi(2/4)}}{p_6}, \\ \frac{0.73e^{i2\pi(4/4)},\ 0.82e^{i2\pi(3/4)},\ 0.86e^{i2\pi(2/4)},\ 0.93e^{i2\pi(2/4)}}{p_7}, \\ \frac{0.63e^{i2\pi(4/4)},\ 0.70e^{i2\pi(3/4)},\ 0.86e^{i2\pi(2/4)},\ 0.90e^{i2\pi(2/4)}}{p_8}, \\ \frac{0.60e^{i2\pi(4/4)},\ 0.66e^{i2\pi(3/4)},\ 0.86e^{i2\pi(2/4)},\ 0.96e^{i2\pi(2/4)}}{p_9} \end{array}\right\}$$

$$f_Y\left(\frac{0.33}{e_2}, x, 1\right)(p) = \left\{\begin{array}{l} \frac{0.35e^{i2\pi(1/4)},\ 0.254e^{i2\pi(2/4)},\ 0.23e^{i2\pi(3/4)},\ 0.74e^{i2\pi(2/4)}}{p_1}, \\ \frac{0.60e^{i2\pi(4/4)},\ 0.40e^{i2\pi(3/4)},\ 0.30e^{i2\pi(2/4)},\ 0.60e^{i2\pi(2/4)}}{p_2}, \\ \frac{0.14e^{i2\pi(4/4)},\ 0.20e^{i2\pi(3/4)},\ 0.12e^{i2\pi(2/4)},\ 0.24e^{i2\pi(2/4)}}{p_3}, \\ \frac{0.35e^{i2\pi(4/4)},\ 0.53e^{i2\pi(3/4)},\ 0.50e^{i2\pi(2/4)},\ 0.12e^{i2\pi(2/4)}}{p_4}, \\ \frac{0.60e^{i2\pi(4/4)},\ 0.33e^{i2\pi(3/4)},\ 0.65e^{i2\pi(2/4)},\ 0.30e^{i2\pi(2/4)}}{p_5}, \\ \frac{0.22e^{i2\pi(4/4)},\ 0.60e^{i2\pi(3/4)},\ 0.75e^{i2\pi(2/4)},\ 0.26e^{i2\pi(2/4)}}{p_6}, \\ \frac{0.30e^{i2\pi(4/4)},\ 0.40e^{i2\pi(3/4)},\ 0.34e^{i2\pi(2/4)},\ 0.20e^{i2\pi(2/4)}}{p_7}, \\ \frac{0.33e^{i2\pi(4/4)},\ 0.28e^{i2\pi(3/4)},\ 0.33e^{i2\pi(2/4)},\ 0.32e^{i2\pi(2/4)}}{p_8}, \\ \frac{0.10e^{i2\pi(4/4)},\ 0.30e^{i2\pi(3/4)},\ 0.40e^{i2\pi(2/4)},\ 0.15e^{i2\pi(2/4)}}{p_9} \end{array}\right\}$$

$$f_Y\left(\frac{0.21}{e_3}, x, 1\right)(p) = \left\{\begin{array}{l} \frac{0.61e^{i2\pi(1/4)},\ 0.81e^{i2\pi(2/4)},\ 0.86e^{i2\pi(3/4)},\ 1.0e^{i2\pi(2/4)}}{p_1}, \\ \frac{0.54e^{i2\pi(4/4)},\ 0.62e^{i2\pi(3/4)},\ 0.77e^{i2\pi(2/4)},\ 0.90e^{i2\pi(2/4)}}{p_2}, \\ \frac{0.65e^{i2\pi(4/4)},\ 0.80e^{i2\pi(3/4)},\ 0.86e^{i2\pi(2/4)},\ 0.90e^{i2\pi(2/4)}}{p_3}, \\ \frac{0.54e^{i2\pi(4/4)},\ 0.66e^{i2\pi(3/4)},\ 172e^{i2\pi(2/4)},\ 0.77e^{i2\pi(2/4)}}{p_4}, \\ \frac{0.59e^{i2\pi(4/4)},\ 0.62e^{i2\pi(3/4)},\ 0.72e^{i2\pi(2/4)},\ 0.95e^{i2\pi(2/4)}}{p_5}, \\ \frac{0.61e^{i2\pi(4/4)},\ 0.75e^{i2\pi(3/4)},\ 0.86e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_6}, \\ \frac{0.63e^{i2\pi(4/4)},\ 0.75e^{i2\pi(3/4)},\ 0.90e^{i2\pi(2/4)},\ 0.95e^{i2\pi(2/4)}}{p_7}, \\ \frac{0.62e^{i2\pi(4/4)},\ 0.85e^{i2\pi(3/4)},\ 0.95e^{i2\pi(2/4)},\ 0.97e^{i2\pi(2/4)}}{p_8}, \\ \frac{0.63e^{i2\pi(4/4)},\ 0.81e^{i2\pi(3/4)},\ 0.90e^{i2\pi(2/4)},\ 0.95e^{i2\pi(2/4)}}{p_9} \end{array}\right\}$$

$$f_Y\left(\frac{0.21}{e_3}, x, 0\right)(p) = \left\{ \begin{array}{l} \frac{0.29e^{i2\pi(1/4)},\ 0.54e^{i2\pi(2/4)},\ 0.60e^{i2\pi(3/4)},\ 0.24e^{i2\pi(2/4)}}{p_1}, \\ \frac{0.33e^{i2\pi(4/4)},\ 0.23e^{i2\pi(3/4)},\ 0.62e^{i2\pi(2/4)},\ 0.10e^{i2\pi(2/4)}}{p_2}, \\ \frac{0.44e^{i2\pi(4/4)},\ 0.50e^{i2\pi(3/4)},\ 0.32e^{i2\pi(2/4)},\ 0.24e^{i2\pi(2/4)}}{p_3}, \\ \frac{0.65e^{i2\pi(4/4)},\ 0.73e^{i2\pi(3/4)},\ 0.60e^{i2\pi(2/4)},\ 0.27e^{i2\pi(2/4)}}{p_4}, \\ \frac{0.70e^{i2\pi(4/4)},\ 0.53e^{i2\pi(3/4)},\ 0.425e^{i2\pi(2/4)},\ 0.40e^{i2\pi(2/4)}}{p_5}, \\ \frac{0.34e^{i2\pi(4/4)},\ 0.60e^{i2\pi(3/4)},\ 0.15e^{i2\pi(2/4)},\ 0.43e^{i2\pi(2/4)}}{p_6}, \\ \frac{0.70e^{i2\pi(4/4)},\ 0.20e^{i2\pi(3/4)},\ 0.34e^{i2\pi(2/4)},\ 0.40e^{i2\pi(2/4)}}{p_7}, \\ \frac{0.82e^{i2\pi(4/4)},\ 0.40e^{i2\pi(3/4)},\ 0.84e^{i2\pi(2/4)},\ 0.42e^{i2\pi(2/4)}}{p_8}, \\ \frac{0.45e^{i2\pi(4/4)},\ 0.62e^{i2\pi(3/4)},\ 0.60e^{i2\pi(2/4)},\ 0.25e^{i2\pi(2/4)}}{p_9} \end{array} \right\}$$

$$f_Y\left(\frac{0.25}{e_4}, x, 1\right)(p) = \left\{ \begin{array}{l} \frac{0.75e^{i2\pi(1/4)},\ 0.84e^{i2\pi(2/4)},\ 0.90e^{i2\pi(3/4)},\ 1.0e^{i2\pi(2/4)}}{p_1}, \\ \frac{0.90e^{i2\pi(4/4)},\ 0.97e^{i2\pi(3/4)},\ 0.98e^{i2\pi(2/4)},\ 0.99e^{i2\pi(2/4)}}{p_2}, \\ \frac{0.75e^{i2\pi(4/4)},\ 0.78e^{i2\pi(3/4)},\ 0.82e^{i2\pi(2/4)},\ 0.90e^{i2\pi(2/4)}}{p_3}, \\ \frac{0.67e^{i2\pi(4/4)},\ 0.82e^{i2\pi(3/4)},\ 0.91e^{i2\pi(2/4)},\ 0.99e^{i2\pi(2/4)}}{p_4}, \\ \frac{0.75e^{i2\pi(4/4)},\ 0.80e^{i2\pi(3/4)},\ 0.90e^{i2\pi(2/4)},\ 0.92e^{i2\pi(2/4)}}{p_5}, \\ \frac{0.82e^{i2\pi(4/4)},\ 0.95e^{i2\pi(3/4)},\ 0.97e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_6}, \\ \frac{0.75e^{i2\pi(4/4)},\ 0.92e^{i2\pi(3/4)},\ 0.97e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_7}, \\ \frac{0.82e^{i2\pi(4/4)},\ 0.87e^{i2\pi(3/4)},\ 0.90e^{i2\pi(2/4)},\ 0.97e^{i2\pi(2/4)}}{p_8}, \\ \frac{0.75e^{i2\pi(4/4)},\ 0.75e^{i2\pi(3/4)},\ 0.86e^{i2\pi(2/4)},\ 0.90e^{i2\pi(2/4)}}{p_9} \end{array} \right\}$$

$$f_Y\left(\frac{0.25}{e_4}, x, 0\right)(p) = \left\{\begin{array}{l}
\frac{0.15e^{i2\pi(1/4)},\ 0.34e^{i2\pi(2/4)},\ 0.60e^{i2\pi(3/4)},\ 0.54e^{i2\pi(2/4)}}{p_1}, \\
\frac{0.61e^{i2\pi(4/4)},\ 0.20e^{i2\pi(3/4)},\ 0.50e^{i2\pi(2/4)},\ 0.10e^{i2\pi(2/4)}}{p_2}, \\
\frac{0.34e^{i2\pi(4/4)},\ 0.60e^{i2\pi(3/4)},\ 0.52e^{i2\pi(2/4)},\ 0.34e^{i2\pi(2/4)}}{p_3}, \\
\frac{0.25e^{i2\pi(4/4)},\ 0.83e^{i2\pi(3/4)},\ 0.33e^{i2\pi(2/4)},\ 0.32e^{i2\pi(2/4)}}{p_4}, \\
\frac{0.70e^{i2\pi(4/4)},\ 0.43e^{i2\pi(3/4)},\ 0.45e^{i2\pi(2/4)},\ 0.40e^{i2\pi(2/4)}}{p_5}, \\
\frac{0.24e^{i2\pi(4/4)},\ 0.90e^{i2\pi(3/4)},\ 0.25e^{i2\pi(2/4)},\ 0.46e^{i2\pi(2/4)}}{p_6}, \\
\frac{0.30e^{i2\pi(4/4)},\ 0.10e^{i2\pi(3/4)},\ 0.54e^{i2\pi(2/4)},\ 0.20e^{i2\pi(2/4)}}{p_7}, \\
\frac{0.42e^{i2\pi(4/4)},\ 0.22e^{i2\pi(3/4)},\ 0.44e^{i2\pi(2/4)},\ 0.12e^{i2\pi(2/4)}}{p_8}, \\
\frac{0.15e^{i2\pi(4/4)},\ 0.55e^{i2\pi(3/4)},\ 0.50e^{i2\pi(2/4)},\ 0.25e^{i2\pi(2/4)}}{p_9}
\end{array}\right\}$$

$$f_Y\left(\frac{0.80}{e_5}, x, 1\right)(p) = \left\{\begin{array}{l}
\frac{0.50e^{i2\pi(1/4)},\ 0.70e^{i2\pi(2/4)},\ 0.80e^{i2\pi(3/4)},\ 1.0e^{i2\pi(2/4)}}{p_1}, \\
\frac{0.50e^{i2\pi(4/4)},\ 0.55e^{i2\pi(3/4)},\ 0.94e^{i2\pi(2/4)},\ 0.97e^{i2\pi(2/4)}}{p_2}, \\
\frac{0.50e^{i2\pi(4/4)},\ 0.55e^{i2\pi(3/4)},\ 0.85e^{i2\pi(2/4)},\ 0.90e^{i2\pi(2/4)}}{p_3}, \\
\frac{0.52e^{i2\pi(4/4)},\ 0.60e^{i2\pi(3/4)},\ 0.80e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_4}, \\
\frac{0.50e^{i2\pi(4/4)},\ 0.72e^{i2\pi(3/4)},\ 0.80e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_5}, \\
\frac{0.45e^{i2\pi(4/4)},\ 0.70e^{i2\pi(3/4)},\ 0.77e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_6}, \\
\frac{0.50e^{i2\pi(4/4)},\ 0.57e^{i2\pi(3/4)},\ 0.80e^{i2\pi(2/4)},\ 0.92e^{i2\pi(2/4)}}{p_7}, \\
\frac{0.60e^{i2\pi(4/4)},\ 0.70e^{i2\pi(3/4)},\ 0.92e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_8}, \\
\frac{0.50e^{i2\pi(4/4)},\ 0.55e^{i2\pi(3/4)},\ 0.80e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_9}
\end{array}\right\}$$

$$f_Y\left(\frac{0.80}{e_5}, x, 0\right)(p) = \left\{ \begin{array}{c} \dfrac{0.5e^{i2\pi(1/4)},\ 0.24e^{i2\pi(2/4)},\ 0.73e^{i2\pi(3/4)},\ 0.44e^{i2\pi(2/4)}}{p_1}, \\ \dfrac{0.31e^{i2\pi(4/4)},\ 0.70e^{i2\pi(3/4)},\ 0.50e^{i2\pi(2/4)},\ 0.70e^{i2\pi(2/4)}}{p_2}, \\ \dfrac{0.44e^{i2\pi(4/4)},\ 0.30e^{i2\pi(3/4)},\ 0.52e^{i2\pi(2/4)},\ 0.34e^{i2\pi(2/4)}}{p_3}, \\ \dfrac{0.15e^{i2\pi(4/4)},\ 0.83e^{i2\pi(3/4)},\ 0.50e^{i2\pi(2/4)},\ 0.22e^{i2\pi(2/4)}}{p_4}, \\ \dfrac{0.60e^{i2\pi(4/4)},\ 0.83e^{i2\pi(3/4)},\ 0.35e^{i2\pi(2/4)},\ 0.10e^{i2\pi(2/4)}}{p_5}, \\ \dfrac{0.44e^{i2\pi(4/4)},\ 0.30e^{i2\pi(3/4)},\ 0.25e^{i2\pi(2/4)},\ 0.46e^{i2\pi(2/4)}}{p_6}, \\ \dfrac{0.80e^{i2\pi(4/4)},\ 0.30e^{i2\pi(3/4)},\ 0.84e^{i2\pi(2/4)},\ 0.40e^{i2\pi(2/4)}}{p_7}, \\ \dfrac{0.22e^{i2\pi(4/4)},\ 0.38e^{i2\pi(3/4)},\ 0.14e^{i2\pi(2/4)},\ 0.42e^{i2\pi(2/4)}}{p_8}, \\ \dfrac{0.15e^{i2\pi(4/4)},\ 0.36e^{i2\pi(3/4)},\ 0.57e^{i2\pi(2/4)},\ 0.25e^{i2\pi(2/4)}}{p_9} \end{array} \right\}$$

$$f_Y\left(\frac{0.25}{e_6}, x, 1\right)(p) = \left\{ \begin{array}{c} \dfrac{0.38e^{i2\pi(1/4)},\ 0.57e^{i2\pi(2/4)},\ 0.71e^{i2\pi(3/4)},\ 1.0e^{i2\pi(2/4)}}{p_1}, \\ \dfrac{0.38e^{i2\pi(4/4)},\ 0.53e^{i2\pi(3/4)},\ 0.85e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_2}, \\ \dfrac{0.43e^{i2\pi(4/4)},\ 0.53e^{i2\pi(3/4)},\ 0.71e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_3}, \\ \dfrac{0.57e^{i2\pi(4/4)},\ 0.81e^{i2\pi(3/4)},\ 0.85e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_4}, \\ \dfrac{0.38e^{i2\pi(4/4)},\ 0.57e^{i2\pi(3/4)},\ 0.78e^{i2\pi(2/4)},\ 0.92e^{i2\pi(2/4)}}{p_5}, \\ \dfrac{0.43e^{i2\pi(4/4)},\ 0.51e^{i2\pi(3/4)},\ 078e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_6}, \\ \dfrac{0.38e^{i2\pi(4/4)},\ 0.53e^{i2\pi(3/4)},\ 0.57e^{i2\pi(2/4)},\ 0.71e^{i2\pi(2/4)}}{p_7}, \\ \dfrac{0.32e^{i2\pi(4/4)},\ 0.57e^{i2\pi(3/4)},\ 0.85e^{i2\pi(2/4)},\ 0.97e^{i2\pi(2/4)}}{p_8}, \\ \dfrac{0.31e^{i2\pi(4/4)},\ 0.53e^{i2\pi(3/4)},\ 0.85e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_9} \end{array} \right\}$$

$$f_Y\left(\frac{0.25}{e_6}, x, 0\right)(p) = \left\{\begin{array}{l}
\frac{0.38e^{i2\pi(4/4)},\ 0.53e^{i2\pi(3/4)},\ 0.57e^{i2\pi(2/4)},\ 0.71e^{i2\pi(2/4)}}{p_1}, \\
\frac{0.61e^{i2\pi(4/4)},\ 0.20e^{i2\pi(3/4)},\ 0.55e^{i2\pi(2/4)},\ 0.40e^{i2\pi(2/4)}}{p_2}, \\
\frac{0.57e^{i2\pi(4/4)},\ 0.81e^{i2\pi(3/4)},\ 0.85e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_3}, \\
\frac{0.15e^{i2\pi(4/4)},\ 0.83e^{i2\pi(3/4)},\ 0.50e^{i2\pi(2/4)},\ 0.22e^{i2\pi(2/4)}}{p_4}, \\
\frac{0.80e^{i2\pi(4/4)},\ 0.83e^{i2\pi(3/4)},\ 0.45e^{i2\pi(2/4)},\ 0.60e^{i2\pi(2/4)}}{p_5}, \\
\frac{0.44e^{i2\pi(4/4)},\ 0.30e^{i2\pi(3/4)},\ 0.25e^{i2\pi(2/4)},\ 0.46e^{i2\pi(2/4)}}{p_6}, \\
\frac{0.57e^{i2\pi(4/4)},\ 0.81e^{i2\pi(3/4)},\ 0.25e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_7}, \\
\frac{0.22e^{i2\pi(4/4)},\ 0.88e^{i2\pi(3/4)},\ 0.44e^{i2\pi(2/4)},\ 0.42e^{i2\pi(2/4)}}{p_8}, \\
\frac{0.15e^{i2\pi(4/4)},\ 0.36e^{i2\pi(3/4)},\ 0.50e^{i2\pi(2/4)},\ 0.25e^{i2\pi(2/4)}}{p_9}
\end{array}\right\}$$

$$f_Y\left(\frac{0.20}{e_7}, x, 1\right)(p) = \left\{\begin{array}{l}
\frac{0.28e^{i2\pi(1/4)},\ 0.57e^{i2\pi(2/4)},\ 0.71e^{i2\pi(3/4)},\ 1.0e^{i2\pi(2/4)}}{p_1}, \\
\frac{0.33e^{i2\pi(4/4)},\ 0.53e^{i2\pi(3/4)},\ 0.85e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_2}, \\
\frac{0.43e^{i2\pi(4/4)},\ 0.53e^{i2\pi(3/4)},\ 0.71e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_3}, \\
\frac{0.57e^{i2\pi(4/4)},\ 0.81e^{i2\pi(3/4)},\ 0.85e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_4}, \\
\frac{0.38e^{i2\pi(4/4)},\ 0.57e^{i2\pi(3/4)},\ 0.78e^{i2\pi(2/4)},\ 0.92e^{i2\pi(2/4)}}{p_5}, \\
\frac{0.43e^{i2\pi(4/4)},\ 0.51e^{i2\pi(3/4)},\ 078e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_6}, \\
\frac{0.38e^{i2\pi(4/4)},\ 0.53e^{i2\pi(3/4)},\ 0.57e^{i2\pi(2/4)},\ 0.71e^{i2\pi(2/4)}}{p_7}, \\
\frac{0.32e^{i2\pi(4/4)},\ 0.57e^{i2\pi(3/4)},\ 0.85e^{i2\pi(2/4)},\ 0.97e^{i2\pi(2/4)}}{p_8}, \\
\frac{0.31e^{i2\pi(4/4)},\ 0.53e^{i2\pi(3/4)},\ 0.85e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_9}
\end{array}\right\}$$

$$f_Y\left(\frac{0.20}{e_7}, x, 0\right)(p) = \left\{\begin{array}{c}
\frac{0.18e^{i2\pi(1/4)},\ 0.57e^{i2\pi(2/4)},\ 0.71e^{i2\pi(3/4)},\ 1.0e^{i2\pi(2/4)}}{p_1}, \\
\frac{0.18e^{i2\pi(4/4)},\ 0.53e^{i2\pi(3/4)},\ 0.85e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_2}, \\
\frac{0.43e^{i2\pi(4/4)},\ 0.53e^{i2\pi(3/4)},\ 0.71e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_3}, \\
\frac{0.57e^{i2\pi(4/4)},\ 0.81e^{i2\pi(3/4)},\ 0.85e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_4}, \\
\frac{0.38e^{i2\pi(4/4)},\ 0.57e^{i2\pi(3/4)},\ 0.78e^{i2\pi(2/4)},\ 0.92e^{i2\pi(2/4)}}{p_5}, \\
\frac{0.43e^{i2\pi(4/4)},\ 0.51e^{i2\pi(3/4)},\ 078e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_6}, \\
\frac{0.38e^{i2\pi(4/4)},\ 0.53e^{i2\pi(3/4)},\ 0.57e^{i2\pi(2/4)},\ 0.71e^{i2\pi(2/4)}}{p_7}, \\
\frac{0.32e^{i2\pi(4/4)},\ 0.57e^{i2\pi(3/4)},\ 0.85e^{i2\pi(2/4)},\ 0.97e^{i2\pi(2/4)}}{p_8}, \\
\frac{0.31e^{i2\pi(4/4)},\ 0.53e^{i2\pi(3/4)},\ 0.85e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_9}
\end{array}\right\}$$

$$f_Y\left(\frac{0.31}{e_8}, x, 1\right)(p) = \left\{\begin{array}{c}
\frac{0.52e^{i2\pi(1/4)},\ 0.70e^{i2\pi(2/4)},\ 0.80e^{i2\pi(3/4)},\ 1.0e^{i2\pi(2/4)}}{p_1}, \\
\frac{0.30e^{i2\pi(4/4)},\ 0.55e^{i2\pi(3/4)},\ 0.94e^{i2\pi(2/4)},\ 0.97e^{i2\pi(2/4)}}{p_2}, \\
\frac{0.55e^{i2\pi(4/4)},\ 0.55e^{i2\pi(3/4)},\ 0.85e^{i2\pi(2/4)},\ 0.90e^{i2\pi(2/4)}}{p_3}, \\
\frac{0.52e^{i2\pi(4/4)},\ 0.60e^{i2\pi(3/4)},\ 0.80e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_4}, \\
\frac{0.50e^{i2\pi(4/4)},\ 0.72e^{i2\pi(3/4)},\ 0.80e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_5}, \\
\frac{0.45e^{i2\pi(4/4)},\ 0.70e^{i2\pi(3/4)},\ 0.77e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_6}, \\
\frac{0.50e^{i2\pi(4/4)},\ 0.57e^{i2\pi(3/4)},\ 0.80e^{i2\pi(2/4)},\ 0.92e^{i2\pi(2/4)}}{p_7}, \\
\frac{0.60e^{i2\pi(4/4)},\ 0.70e^{i2\pi(3/4)},\ 0.92e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_8}, \\
\frac{0.50e^{i2\pi(4/4)},\ 0.55e^{i2\pi(3/4)},\ 0.80e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_9}
\end{array}\right\}$$

$$f_Y\left(\frac{0.31}{e_8}, x, 0\right)(p) = \left\{\begin{array}{c}
\frac{0.20e^{i2\pi(1/4)},\ 0.70e^{i2\pi(2/4)},\ 0.80e^{i2\pi(3/4)},\ 1.0e^{i2\pi(2/4)}}{p_1}, \\
\frac{0.10e^{i2\pi(4/4)},\ 0.55e^{i2\pi(3/4)},\ 0.94e^{i2\pi(2/4)},\ 0.97e^{i2\pi(2/4)}}{p_2}, \\
\frac{0.50e^{i2\pi(4/4)},\ 0.55e^{i2\pi(3/4)},\ 0.85e^{i2\pi(2/4)},\ 0.90e^{i2\pi(2/4)}}{p_3}, \\
\frac{0.52e^{i2\pi(4/4)},\ 0.60e^{i2\pi(3/4)},\ 0.80e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_4}, \\
\frac{0.50e^{i2\pi(4/4)},\ 0.72e^{i2\pi(3/4)},\ 0.80e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_5}, \\
\frac{0.45e^{i2\pi(4/4)},\ 0.70e^{i2\pi(3/4)},\ 0.77e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_6}, \\
\frac{0.50e^{i2\pi(4/4)},\ 0.57e^{i2\pi(3/4)},\ 0.80e^{i2\pi(2/4)},\ 0.92e^{i2\pi(2/4)}}{p_7}, \\
\frac{0.60e^{i2\pi(4/4)},\ 0.70e^{i2\pi(3/4)},\ 0.92e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_8}, \\
\frac{0.50e^{i2\pi(4/4)},\ 0.55e^{i2\pi(3/4)},\ 0.80e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_9}
\end{array}\right\}$$

$$f_Y\left(\frac{0.21}{e_9}, x, 1\right)(p) = \left\{\begin{array}{c}
\frac{0.25e^{i2\pi(1/4)},\ 0.84e^{i2\pi(2/4)},\ 0.90e^{i2\pi(3/4)},\ 1.0e^{i2\pi(2/4)}}{p_1}, \\
\frac{0.40e^{i2\pi(4/4)},\ 0.97e^{i2\pi(3/4)},\ 0.98e^{i2\pi(2/4)},\ 0.99e^{i2\pi(2/4)}}{p_2}, \\
\frac{0.75e^{i2\pi(4/4)},\ 0.78e^{i2\pi(3/4)},\ 0.82e^{i2\pi(2/4)},\ 0.90e^{i2\pi(2/4)}}{p_3}, \\
\frac{0.67e^{i2\pi(4/4)},\ 0.82e^{i2\pi(3/4)},\ 0.91e^{i2\pi(2/4)},\ 0.99e^{i2\pi(2/4)}}{p_4}, \\
\frac{0.75e^{i2\pi(4/4)},\ 0.80e^{i2\pi(3/4)},\ 0.90e^{i2\pi(2/4)},\ 0.92e^{i2\pi(2/4)}}{p_5}, \\
\frac{0.82e^{i2\pi(4/4)},\ 0.95e^{i2\pi(3/4)},\ 0.97e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_6}, \\
\frac{0.75e^{i2\pi(4/4)},\ 0.92e^{i2\pi(3/4)},\ 0.97e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_7}, \\
\frac{0.82e^{i2\pi(4/4)},\ 0.87e^{i2\pi(3/4)},\ 0.90e^{i2\pi(2/4)},\ 0.97e^{i2\pi(2/4)}}{p_8}, \\
\frac{0.75e^{i2\pi(4/4)},\ 0.75e^{i2\pi(3/4)},\ 0.86e^{i2\pi(2/4)},\ 0.90e^{i2\pi(2/4)}}{p_9}
\end{array}\right\}$$

$$f_Y\left(\frac{0.21}{e_9},x,0\right)(p) = \left\{\begin{array}{l} \frac{0.85e^{i2\pi(1/4)},\ 0.84e^{i2\pi(2/4)},\ 0.90e^{i2\pi(3/4)},\ 1.0e^{i2\pi(2/4)}}{p_1}, \\ \frac{0.40e^{i2\pi(4/4)},\ 0.97e^{i2\pi(3/4)},\ 0.98e^{i2\pi(2/4)},\ 0.99e^{i2\pi(2/4)}}{p_2}, \\ \frac{0.75e^{i2\pi(4/4)},\ 0.78e^{i2\pi(3/4)},\ 0.82e^{i2\pi(2/4)},\ 0.90e^{i2\pi(2/4)}}{p_3}, \\ \frac{0.67e^{i2\pi(4/4)},\ 0.82e^{i2\pi(3/4)},\ 0.91e^{i2\pi(2/4)},\ 0.99e^{i2\pi(2/4)}}{p_4}, \\ \frac{0.75e^{i2\pi(4/4)},\ 0.80e^{i2\pi(3/4)},\ 0.90e^{i2\pi(2/4)},\ 0.92e^{i2\pi(2/4)}}{p_5}, \\ \frac{0.82e^{i2\pi(4/4)},\ 0.95e^{i2\pi(3/4)},\ 0.97e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_6}, \\ \frac{0.75e^{i2\pi(4/4)},\ 0.92e^{i2\pi(3/4)},\ 0.97e^{i2\pi(2/4)},\ 1.0e^{i2\pi(2/4)}}{p_7}, \\ \frac{0.82e^{i2\pi(4/4)},\ 0.87e^{i2\pi(3/4)},\ 0.90e^{i2\pi(2/4)},\ 0.97e^{i2\pi(2/4)}}{p_8}, \\ \frac{0.75e^{i2\pi(4/4)},\ 0.75e^{i2\pi(3/4)},\ 0.86e^{i2\pi(2/4)},\ 0.90e^{i2\pi(2/4)}}{p_9} \end{array}\right\}$$

To arrive reality values from the life should transform the data for the patients from complex to real values, so let $(\alpha_1,\alpha_2,\alpha_3)=(0.1, 0.2, 0.1)$ is weigh for the amplitude and phrase terms respectively, to get the weighted aggregation values of $\mu^j{}_{f_Y(\sigma_s)}(u_s), \forall\, \sigma_s \in A\ \forall u \in U$ and $j=1,2,3,\ldots\ldots,k$ for the FP- M^kFSES $(f,A)_Y$

So, calculate $\mu^j{}_{f_Y(\sigma_1)}(p)$ when $\sigma_1(e_1,x,1)$ and $j=1,2,3,\ldots\ldots,k$. Begin by representation of the agree- FP- M^kFSES, and calculate the values of $C_{ll}=\frac{\sum_{j=1}^{k}\mu^j{}_{f_Y(\sigma_l)}(u_l)}{k}$ $\forall\,\sigma_l \in A\ \forall u_l \in U$ and $j=1,2,3,\ldots\ldots,k$ For agree- FP- M^kFSES and dis- agree- FP- M^kFSES in table 3 and table 4

$$\mu^1{}_{f_Y\left(\frac{0.88}{e_1},x,1\right)}(p) = \alpha_1 r^1{}_{f_Y\left(\frac{0.30}{e_1},x,1\right)}(p_1)+\alpha_2 r^2{}_{f_Y\left(\frac{0.30}{e_1},x,1\right)}(p_1)+\alpha_3\left(\frac{1}{2\pi}\right)\omega^1{}_{f_Y\left(\frac{0.30}{e_1},x,1\right)}(p_1)$$
$$(0.1)(0.75)+(0.2)(0.84)+(0.1)\left(\frac{1}{2\pi}\right)(2\pi)\left(\frac{1}{4}\right)$$
$$= 0.26$$

$$\mu^1{}_{f_Y\left(\frac{0.33}{e_2},x,1\right)}(p) = \alpha_1 r^1{}_{f_Y\left(\frac{0.33}{e_2},x,1\right)}(p_1)+\alpha_2 r^2{}_{f_Y\left(\frac{0.33}{e_2},x,1\right)}(p_1)+\alpha_3\left(\frac{1}{2\pi}\right)\omega^1{}_{f_Y\left(\frac{0.33}{e_2},x,1\right)}(p_1)$$
$$(0.1)(0.65)+(0.2)(0.70)+(0.1)\left(\frac{1}{2\pi}\right)(2\pi)\left(\frac{1}{4}\right)$$
$$= 0.23$$

By the same fashion, we get

p	p_1	p_2	p_3	p_4	p_5	p_6	p_7	p_8	p_9
$\left(\frac{0.30}{e_1}, x, 1\right)$	0.26	0.28	0.23	0.23	0.23	0.27	0.25	0.25	0.22
$\left(\frac{0.33}{e_2}, x, 1\right)$	0.23	0.12	0.20	0.24	0.20	0.22	0.23	0.20	0.19
$\left(\frac{0.21}{e_3}, x, 1\right)$	0.24	0.17	0.22	0.18	0.18	0.21	0.21	0.23	0.22
$\left(\frac{0.25}{e_4}, x, 1\right)$	0.26	0.28	0.23	0.23	0.23	0.27	0.25	0.25	0.22
$\left(\frac{0.80}{e_5}, x, 1\right)$	0.21	0.16	0.16	0.17	0.19	0.18	0.18	0.20	0.16
$\left(\frac{0.25}{e_6}, x, 1\right)$	0.17	0.14	0.14	0.11	0.15	0.14	0.14	0.14	0.13
$\left(\frac{0.20}{e_7}, x, 1\right)$	0.16	0.13	0.14	0.21	0.15	0.14	0.14	0.14	0.13
$\left(\frac{0.31}{e_8}, x, 1\right)$	0.21	0.14	0.16	0.17	0.19	0.18	0.16	0.20	0.16
$\left(\frac{0.21}{e_9}, x, 1\right)$	0.21	0.23	0.23	0.23	0.23	0.27	0.25	0.25	0.22
$k_l = \frac{\sum_{x\in X}\sum_l C_{ll}(\eta_Y(p_l))}{k}$	$k_1 = 1.95$	$k_2 = 1.65$	$k_3 = 1.71$	$k_4 = 1.77$	$k_5 = 1.75$	$k_6 = 1.88$	$k_7 = 1.81$	$k_8 = 1.86$	$k_9 = 1.65$

Table 4. Tabular representation of the agree- FP- M^kFSES $(f, A)_Y$

Secondly, representation of the dis- agree- FP- M^kFSES $(f, A)_Y$

p	p_1	p_2	p_3	p_4	p_5	p_6	p_7	p_8	p_9
$f_Y\left(\frac{0.30}{e_1}, x, 0\right)$	0.09	0.12	0.10	0.18	0.24	0.12	0.19	0.19	0.11
$f_Y\left(\frac{0.33}{e_2}, x, 0\right)$	0.11	0.14	0.05	0.14	0.12	0.14	0.11	0.08	0.07
$f_Y\left(\frac{0.21}{e_3}, x, 0\right)$	0.16	0.07	0.14	0.21	0.18	0.15	0.11	0.16	0.16

$f_Y\left(\frac{0.25}{e_4}, x, 0\right)$	0.10	0.10	0.15	0.19	0.15	0.20	0.05	0.08	0.12
$f_Y\left(\frac{0.80}{e_5}, x, 0\right)$	0.12	0.17	0.10	0.19	0.22	0.10	0.14	0.09	0.08
$f_Y\left(\frac{0.25}{e_6}, x, 0\right)$	0.14	0.10	0.21	0.18	0.24	0.10	0.21	0.19	0.08
$f_Y\left(\frac{0.20}{e_7}, x, 0\right)$	0.15	0.12	0.14	0.21	0.15	0.14	0.14	0.14	0.13
$f_Y\left(\frac{0.31}{e_8}, x, 0\right)$	0.18	0.12	0.16	0.17	0.19	0.18	0.16	0.20	0.16
$f_Y\left(\frac{0.21}{e_9}, x, 0\right)$	0.27	0.23	0.23	0.23	0.23	0.23	0.25	0.25	0.22
$S_l = \frac{\sum_{x \in X} \sum_l C_{ll}(\eta_Y(p_l))}{k}$	$S_1 = 1.32$	$S_2 = 1.17$	$S_3 = 1.28$	$S_4 = 1.70$	$S_5 = 1.72$	$S_6 = 1.36$	$S_7 = 1.36$	$S_8 = 1.38$	$S_9 = 1.13$

Table 5: Tabular representation of the dis- agree- FP- $M^k FSES$ $(f, A)_Y$

The statement $f_Y\left(\frac{0.30}{e_1}, x, 1\right)(p_1) = 0.26$ mean that the patient p_1 suffers from systolic blood pressure with degree 0.26 (very high degree because it is nearly from 0.30) and the statement $f_Y\left(\frac{0.30}{e_1}, x, 0\right)(p_1) = 0.09$ (low degree because it is far from 0.03) mean the patient p_1 not suffer from systolic blood pressure with degree 0.09. In the following table 5: we state the values of agree- FP- $M^k FSES$ and dis- agree- FP- $M^k FSES$ By using the equation $R_l = k_l - S_l$

P	R_l
P_1	0.63
P_2	0.48
P_3	0.43
P_4	0.07
P_5	0.03
P_6	0.52
P_7	0.45
P_8	0.48
P_9	0.52

Table 6: $R_l = k_l - S_l$

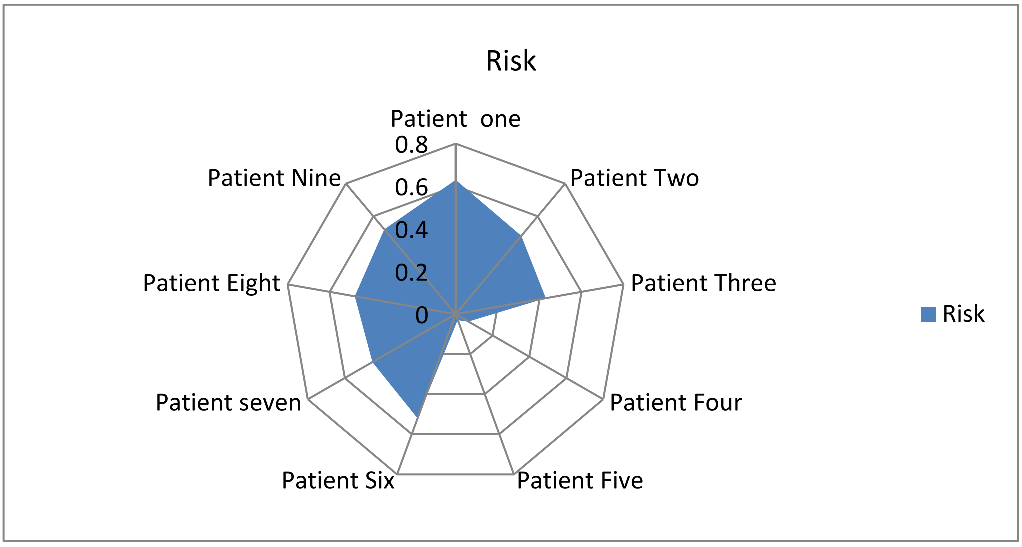

Figure 1 (degree of risk) $R_l = k_l - S_l$

Proposed Fuzzy Parameterized Complex Multi-Fuzzy Soft Expert Set (FP- $CM^k FSES$) decision

P	Order Risk	Decision
P_1	1	Intervention
P_2	3	Intervention
P_3	5	Drug therapy
P_4	6	Drug therapy
P_5	7	Drug therapy
P_6	2	Intervention
P_7	4	Intervention
P_8	3	Intervention
P_9	2	Intervention

Table 7: Decision

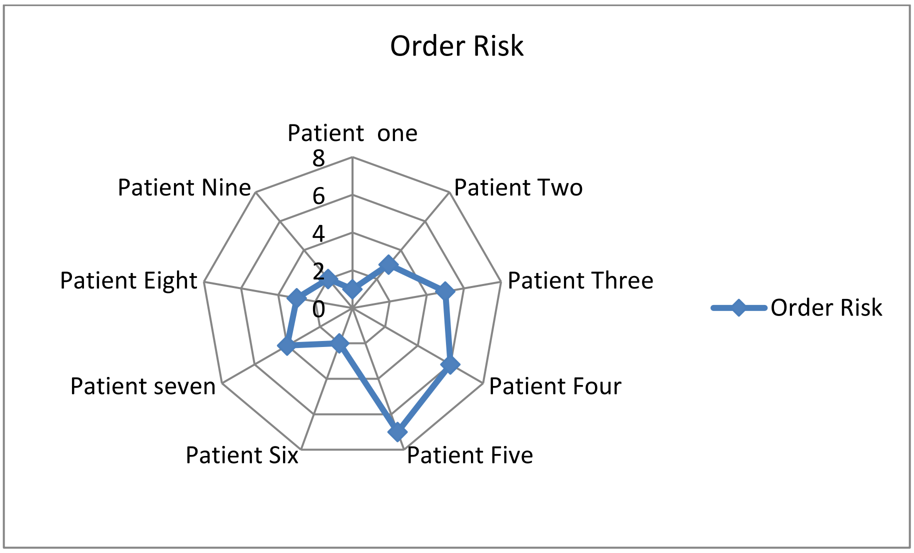

Figure 2: Order risk

Clearly, the patient 1, 6,9,2 and 8 have a maximum risk with value is 0.63, 0.52, 0.52, 0.48 and 0.48 respectively, as shown in Table 6, figure 1 and so the optimal decision Intervention. In table 7 and figure 2 explained the order risks of aptients.

5- Conclusion

We transform the reality data for a symptoms for Coronary artery disease from hospital to fuzzy form and extend to fuzzy soft set expert system and a combinations the parameters between a symptoms arrive to talked the treatments of Coronary artery disease A comparison between our treatments and treatments hospital are discussed. Our results and treatments by taking four reading of all asymptotes, but the treatments by doctor take by only one reading.

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