CHAPTER – 8

TRIANGULAR NEUTROSOphIC COGNITIVE MAPS
8.1 INTRODUCTION

The main objective in this chapter is the study at length of the various reasons for Miracles with incidents from the Holy Bible adopting the new fuzzy tool called Triangular Neutrosophic Cognitive Maps to analyze the social problem. Usually in NCM we analyze the measure not only the existence of causal relation between concepts or the absence of causal relations between two concepts but also gives representation to the indeterminacy of relations between any two concepts. But this new model gives ranking for the causes and indeterminacy of relations between any two concepts of the problem. The present study deals with studying at length the various reasons for miracles with incidents from the Holy Bible using Triangular Neutrosophic Cognitive Maps (TrNCMs).

8.2 Faith used in four ways in Bible.

1. Mental acceptance, personal belief and acknowledgement of God’s existence
2. A conduct or work inspired by the complete surrender of total acceptance
3. A trusting or trustworthiness.
4. Truth and morality based on Christian faith.

The Holy Bible clearly outlines how an individual’s faith index can be enhanced. Faith comes from hearing and hearing the word of Christ (Romans 10:17). As an individual continues to hear God’s word, Faith sets in (Romans 10:14). This leads to the edifying of good conscience which holds this faith (1Timothy 1:19).
This planted faith starts growing and flourishing within as one continuously seeks the Maker wholeheartedly (Jeremiah 29:13). A diligent search will lead to the Maker (Proverbs 8:19). This search enriches knowledge of God (Proverbs 2:5). Growing in His knowledge enables an individual to produce the fruit of good deeds (Colossians 1:10). This results in the perfecting of Faith (James 2:22). The key is in never wavering, never having misgivings but to be continually deeply rooted and grounded in our faith (Colossians 1:23).

Faith in the Almighty is essential in the growing wake of personal struggles, conflicts, differences within a household and trying and impossible situations. The seed of Faith sown in the hearts of individuals will help them stand the test of times to come. It is therefore necessary that Faith be nurtured which in turn, builds in us a strong relationship with the Master establishing a strong foundation for the dispensation of miracles from humanly difficult and impossible situations.

It is absolutely essential to keep hearing testimonies of church goers, believers and people from good Christian homes. It is well known that hearing the good news will enrich the soul and stands us up strong in dire situations. Total surrender to the maker and listening for His Voice will help us charter the route that He has planned for us. Remembering our difficult times and how we surmounted them will enrich the quality of faith in us. Meditation on the truth and reading encouraging real life encounters would further serve to enhance our Faith quotient. Self-enrichment is the ladder left for us to climb at a pace that is entirely in the hands of the individual and aided by the heavenly power, will result in signs and wonders and Miracles.
8.3 Degrees of the Triangular Fuzzy Number

The linguistic values of the triangular fuzzy numbers are

<table>
<thead>
<tr>
<th>Very Low (VL)</th>
<th>(0, 0, 0.1)</th>
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<tbody>
<tr>
<td>Low (L)</td>
<td>(0, 0.1, 0.3)</td>
</tr>
<tr>
<td>Medium Low (ML)</td>
<td>(0.1, 0.3, 0.5)</td>
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<td>Medium High (MH)</td>
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<td>High (H)</td>
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Table 8.1

Intermediate fuzzy linguistic values

<table>
<thead>
<tr>
<th>Intermediate medium</th>
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<tr>
<td>Lower intermediate</td>
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<tr>
<td>Higher intermediate</td>
<td>(0.5, 0.7, 0.9)</td>
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Table 8.2

8.4 Proposed Triangular Neutrosophic Cognitive Maps (TrNCM)

Triangular Neutrosophic Cognitive Maps (TrNCM) are more applicable when the data in the first place is an unsupervised one. The TrNCM works on the opinion of three experts. TrNCM models the world as a collection of classes and
causal relations between classes. It is a different process when we compare to NCM. Usually the NCM gives only the ON-OFF position and intermediate conditions. But this Triangular Neutrosophic Cognitive Maps is more precise and it gives the ranking for the causes and indeterminacy of relations between any two concepts of the problem by using the weightage of the attribute it is main advantage of the New Triangular Neutrosophic Cognitive Maps.

8.5 BASIC DEFINITIONS OF TRIANGULAR NEUTROSOPHIC COGNITIVE MAPS

**Definition 8.5.1** A TrNCM is a directed graph with concepts like policies, events, etc, as nodes and causalities as edges. It represents casual relationship between concepts.

**Definition 8.5.2** When the nodes of the TrNCM are fuzzy sets then they are called as fuzzy nodes.

**Definition 8.5.3** A TrNCM with edge weights or causalities from the set\{ -1, 0, 1, I\} are called simple TrNCM.

**Definition 8.5.4** Let $\tau_iC_i$ and $\tau_jC_j$ denote the two nodes of the TrNCM. The directed edge from $\tau_iC_i$ to $\tau_jC_j$ denotes the causality $\tau_iC_i$ on $\tau_jC_j$ called connections. Every edge in the TrNCM is weighted with a number in the set \{-1, 0, 1, I\}. Let $e_{ij}$ be the weight of the directed edge $\tau_iC_i$ to $\tau_jC_j$, $e_{ij} \in \{-1, 0, 1, I\}$. $e_{ij} = 0$ if $\tau_iC_i$ does not have any effect on $\tau_jC_j$, $e_{ij} = 1$ if increase (or decreases) in $\tau_iC_i$ causes decrease (or increase) in $\tau_jC_j$, $e_{ij} = I$ if the relation or effect of $\tau_iC_i$ on $\tau_jC_j$ is an indeterminate.
Definition 8.5.5 Let $C_1, C_2, \ldots, C_n$ be nodes of a TrNCM. Let the neutrosophic matrix $N(E)$ be defined as $N(E) = (e_{ij})$ where $e_{ij}$ is the weight of the directed edge $\overrightarrow{C_i C_j}$, where $e_{ij} \in \{-1, 0, 1, I\}$. $N(E)$ is called the neutrosophic adjacency matrix of the TrNCM.

Definition 8.5.6 Let $\overrightarrow{C_1 C_2}, \overrightarrow{C_2 C_3}, \ldots, \overrightarrow{C_{n-1} C_n}$ be nodes of a TrNCM.

Let $A = \{a_1, a_2, \ldots, a_n\}$ where $a_i \in \{0, 1, I\}$. $A$ is called the instantaneous state neutrosophic vector and it denotes the on-off-indeterminate state position of the node at an instant

- $a_i = 0$ if $a_i$ is OFF (no effect)
- $a_i = 1$ if $a_i$ is ON (has effect)
- $a_i = I$ if $a_i$ is indeterminate (effect cannot be determined) for $i = 1, 2, \ldots, n$.

Definition 8.5.7

Let $\overrightarrow{C_1 C_2}, \overrightarrow{C_2 C_3}, \ldots, \overrightarrow{C_{n-1} C_n}$ be nodes of a TrNCM.

Let $\overrightarrow{C_1 C_2}, \overrightarrow{C_2 C_3}, \ldots, \overrightarrow{C_{n-1} C_n}$ be the edges of a TrNCM. Then the edges form a directed cycle. An TrNCM is said to be cyclic if it possesses a directed cycle. An TrNCM is said to be acyclic if it does not possess any directed cycle.

Definition 8.5.8

An TrNCM with cycles is said to have a feedback. When there is a feedback in the TrNCM, i.e., when the casual relations flow through a cycle in a revolutionary manner the TrNCM is called a dynamical system.

Definition 8.5.9

Let $\overrightarrow{C_1 C_2}, \overrightarrow{C_2 C_3}, \ldots, \overrightarrow{C_{n-1} C_n}$ be cycle, when $C_i$ is switched on and if the casuality flow through the edges of a cycle and if it again causes $C_i$, say that the
dynamical system goes round and round. This is true for any node $\tau_i C_i$, for $i = 1, 2, \ldots, n$ the equilibrium state for this dynamical system is called the hidden pattern.

**Definition 8.5.10**

If the equilibrium state of a dynamical system is a unique state vector, then it is called a fixed point. Consider the TrNCM with $\tau_1 C_1, \tau_2 C_2, \ldots, \tau_{11} C_{11}$ as nodes. For example let us start the dynamical system by switching ON $\tau_1 C_1$. Let us assume that the TrNCM settles down with $C_1$ and $C_{11}$ ON i.e. the state vector remain as $(1, 0, 0, \ldots, 1)$ this neutrosophic state vector $(1, 0, 0, \ldots, 1)$ is called the fixed point.

**Definition 8.5.11**

If the TrNCM settles with a neutrosophic state vector repeating in the form $A_1 \rightarrow A_2 \rightarrow \ldots \rightarrow A_i \rightarrow A_1$ then this equilibrium is called a limit cycle of the TrNCM.

8.6 Method of Determining the Hidden Pattern of Triangular Neutrosophic Cognitive Maps (TrNCM)

Step 1: Let $\tau_1 C_1, \tau_2 C_2, \ldots, \tau_{11} C_{11}$ be the nodes of an TrNCM, with feedback, Let $\text{Tr}(M)$ be the associated adjacency matrix.

Step 2: Let us find the hidden pattern when $\tau_1 C_1$ is switched ON. When an input is given as the vector $A_1 = (1, 0, \ldots, 0)$, the data should pass through the relation matrix $M$. This is done by multiplying $A_1$ by the triangular matrix $M$.

Step 3: Let $A_i \text{Tr}(M) = (a_1, a_2, \ldots, a_n)$ will get a triangular vector. Suppose $A_i \text{Tr}(M) = (1, 0, \ldots, 0)$ it gives a triangular weight of the attributes, we call it as $A_i$. 


Step 4: Adding the corresponding node of the three experts opinion, we call it as $A_i \text{Tr}(M)_{\text{sum}}$.

Step 5: The threshold operation is denoted by $\text{Max(weight)}$ i.e., $A_i \text{Tr}(M)_{\text{Max(weight)}}$. That is by replacing $a_i$ by 1 if $a_i$ is the maximum weight of the triangular node (i.e., $a_i=1$), otherwise $a_i$ by 0 (i.e., $a_i=0$).

Step 6: Suppose $A_i \text{Tr}(M) \rightarrow A_2$ then consider $A_2 \text{Tr}(M)_{\text{weight}}$ is nothing but addition of weightage of the ON attribute and $A_i \text{Tr}(M)_{\text{weight}}$.

Step 7: Find $A_2 \text{Tr}(M)_{\text{sum}}$ (i.e., summing of the three experts opinion of each attribute).

Step 8: The threshold operation is denoted by $\text{Max(weight)}$ i.e., $A_2 \text{Tr}(M)_{\text{Max(weight)}}$. That is by replacing $a_i$ by 1 if $a_i$ is the maximum weight of the triangular node (i.e., $a_i=1$), otherwise $a_i$ by 0 (i.e., $a_i=0$).

Step 9: If the $A_i \text{Tr}(M)_{\text{Max(weight)}}$ = $A_2 \text{Tr}(M)_{\text{Max(weight)}}$. Then dynamical system end otherwise repeat the same procedure.

Step 10: This procedure is repeated till we get a limit cycle or a fixed point.

Using the linguistic questionnaire and the expert’s opinion we have taken the following nine concepts \{TrC_1, TrC_2, ..., TrC_9\}

### 8.7 Concept of the Problem

The following eleven concepts \{TrC_1, TrC_2, ..., TrC_{11}\} were taken to analyze and find the miracles through Holy Bible using linguistic questionnaire and the expert’s opinion. The following concepts are taken as the main nodes of our problem.

- $\text{Tr}C_1$ - Perseverance through prayer
- $\text{Tr}C_2$ - Patience
| TrC<sub>3</sub> | Faith |
| TrC<sub>4</sub> | Authority in the Spiritual Realm |
| TrC<sub>5</sub> | Gods Compassion |
| TrC<sub>6</sub> | Forgiveness |
| TrC<sub>7</sub> | Hearing the Word of God |
| TrC<sub>8</sub> | Humility |
| TrC<sub>9</sub> | Love |
| TrC<sub>10</sub> | Obedience |
| TrC<sub>11</sub> | Repentance |

Now we give the connection matrix related with the TrNCM. Given by the expert (Pasteur)
**LINGUISTIC VARIABLES FOR THE TRIANGULAR FUZZY NODES**

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### Linguistic values of the triangular fuzzy nodes

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Attribute TrC\(_1\) is ON: \(A^{(1)} = (1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0)\)

\(A^{(1)}\text{Tr}(M)\text{Weight} = (0, (0.7,0.9,1), (0.7,0.9,1), (0.5,0.7,0.9), (0.5,0.7,0.9),
(0.5,0.7,0.9), (0.5,0.7,0.9), (0.7,0.9,1), (0.9,1,1) ,(0.7,0.9,1))\)

\(A^{(1)}\text{Tr}(M)\text{Average} = (0, 0.8666, 0.8666, 0.7, 0.7, 0.7, 0.7,0.8666, 0.8666, 0.9666,0.8666)\)

\(A^{(1)}\text{Tr}(M)\text{Max(Weight)}\rightarrow (0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 1 \ 0 ) = A^{(1)}\)

\(A^{(1)}\text{Tr}(M)\text{Average} = (0.9343, 0.2899, 0.8376, 0.8376, 0.6766, 0.8376, 0.4833, 0.4833,0.4833)\)

\(A^{(1)}\text{Tr}(M)\text{Max(Weight)}\rightarrow (1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 ) = A^{(1)}\)

**Step:2** Attribute TrC\(_2\) is ON:

\(A^{(2)} = \{ 0 \ 1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \} \)

\(A^{(2)}\text{Tr}(M)\text{Weight} = (0.7,0.9,1), (0), (0.3,0.5,0.7), (0.3,0.5,0.7), (0.9,1,1),
(0.5,0.7,0.9), (0.7,0.9,1), (0.7,0.9,1), (0.7,0.9,1),
(0.1,0,3,0.5) , (0.3,0.5,0.7)\)

\(A^{(2)}\text{Tr}(M)\text{Average} = \{ 0.8666, 0 \ 0.5, 0.5, 0.9666,0.7 \ 0.8666, 0.8666, 0.8666 \ 0.3 \ 0.5 \} \)

\(A^{(2)}\text{Tr}(M)\text{Max(Weight)} = \{ 0 \ 0 \ 0 \ 0 \ 1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \} = A^{(2)}\)

\(A^{(2)}\text{Tr}(M)\text{Average} = \{ 0.6766, 0.9343, 0.8376, 0.4833, \ 0, 0.8376, 0.6766, 0.6766, 0.6766, 0.83765\} \)

\(A^{(2)}\text{Tr}(M)\text{Max(Weight)}\rightarrow \{0, 1 \ 0, 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \} \)
\[ A_2^{(2)} \]
\[ A_1^{(2)} = A_2^{(2)} \]

**STEP:3** Attribute TrC$_3$ is ON

\[ A^{(3)} = \{ 0 \ 0 \ 1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \} \]

\[ A^{(3)}\text{Tr(M)\_Weight} = (0.7,0.9,1), (0.3,0.5,0.7), (0), (0.3,0.5,0.7), (0.9,1,1), (0.7,0.9,1), (0.7,0.9,1), (0.7,0.9,1), (0.7,0.9,1) \]

\[ A^{(3)}\text{Tr(M)\_Average} = \{ 0.8666, 0.5, \ 0, \ 0.5, \ 0.9666, \ 0.8666, \ 0.8666, \ 0.8666, \ 0.8666, \ 0.8666 \} \]

\[ A^{(3)}\text{Tr(M)\_Max(Weight)} \rightarrow \{ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \} = A_1^{(3)} \]

\[ A_1^{(3)}\text{Tr(M)\_Average} = \{ 0.6766, 0.9343, 0.8376, 0.4833, 0, \}
\[ \ 0.8376, 0.6766, 0.6766, 0.8376, 0.6766, 0.8376 \} \]

\[ A_1^{(3)}\text{Tr(M)\_Max(Weight)} \rightarrow \{ 0 \ 1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \} = A_2^{(3)} \]

\[ A_2^{(3)}\text{Tr(M)\_Average} = \{ 0.8096, 0.9343, 0.8376, 0.4833, 0, \}
\[ \ 0.8376, 0.6766, 0.6766, 0.8376, 0.6766, 0.8376 \} \]

\[ A_2^{(3)}\text{Tr(M)\_Max(Weight)} \rightarrow \{ 0 \ 1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \} = A_3^{(3)} \]

\[ A_3^{(3)}\text{Tr(M)\_Average} = \{ 0.8096, 0.46715, 0.46715, 0.90309, \}
\[ \ 0.6540, 0.8096, 0.8096, 0.8096, 0.2802, \]
\[ \ 0.4671 \} \]

\[ A_3^{(3)}\text{Tr(M)\_Max(Weight)} \rightarrow \{ 0 \ 0 \ 0 \ 0 \ 1 \ 0 \ 0 \ 0 \} = A_3^{(3)} \]

\[ A_1^{(3)} = A_3^{(3)} \]

**Step:4** Attribute TrC$_4$ is ON:
\[ A^{(4)} = \{ 0 \ 0 \ 0 \ 1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \} \]
\[ A^{(4)}_{\text{Tr}(M)_{\text{Weight}}} = (0.5,0.7,0.9), (0.3,0.5,0.7), (0.3,0.5,0.7), (0), (0.3,0.5,0.7), (0.1,0.3,0.5), (0.3,0.5,0.7), (0.3,0.5,0.7), (0.3,0.5,0.7), (0.7,0.9,1)(0.7,0.9,1). \]
\[ A^{(4)}_{\text{Tr}(M)_{\text{Average}}} = \{ 0.7, \ 0.5, \ 0.5, \ 0, \ 0.5, \ 0.3, \ 0.5, \ 0.5, \ 0.5, \ 0.9666, \ 0.8666 \} \]
\[ A^{(4)}_{\text{Tr}(M)_{\text{Max(Weight)}}} \rightarrow = \{ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \} = A^{(4)}_{(1)} \]
\[ A^{(4)}_{1} = \{ 0.9343,0.2899,0.8376,0.8376,0.6766,0.8376,0.4833,0.4833,0.4833,0.4833,0.833,0.4833 \} \]
\[ A^{(4)}_{1} \rightarrow \{ 1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \} = A^{(4)}_{(2)} \]
\[ A^{(4)}_{2} = \{0, \ 0.8096, \ 0.8096, \ 0.8096, \ 0.6540, \ 0.6540, \ 0.6540, \ 0.6540, \ 0.9030, \ 0.8096 \} \]
\[ A^{(4)}_{2} \rightarrow \{ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 1 \ 0 \} = A^{(4)}_{(3)} \]
\[ A^{(4)}_{3} = \{ 0.8728, \ 0.2709, \ 0.7825, \ 0.7825, \ 0.6321, \ 0.7825, \ 0.4515, \ 0.4515, \ 0.4515, \ 0, \ 0.4515 \} \]
\[ A^{(4)}_{3} \rightarrow \{ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 1 \ 0 \} = A^{(4)}_{(4)} \]
\[ A_{(4)}^{(4)} = A_{(4)}^{(4)} \]

**Step: 5** Attribute TrC_5 is ON:
\[ A^{(5)} = \{ 0 \ 0 \ 0 \ 0 \ 1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \} \]
\[ A^{(5)} \text{Tr}(M)_{\text{Weight}} = (0.5, 0.7, 0.9), (0.9, 1, 1), (0.7, 0.9, 1), (0.3, 0.5, 0.7), (0), (0.7, 0.9, 1), (0.5, 0.7, 0.9), (0.5, 0.7, 0.9), (0.7, 0.9, 1), (0.5, 0.7, 0.9), (0.7, 0.9, 1) \]

\[ A^{(5)} \text{Tr}(M)_{\text{average}} = \{0.7, 0.9, 0.8666, 0.5, 0, 0.8666, 0.7, 0.7, 0.8666, 0.7, 0.8666\} \]

\[ A^{(5)} \text{Tr}(M)_{\text{Max(Weight)}} \rightarrow \{0, 0, 0, 0, 0, 0, 0, 0, 0\} = A^{(5)}_1 \]

\[ A^{(5)} \text{Tr}(M)_{\text{average}} = \{0.8376, 0, 0.4833, 0.4833, 0.9343, 0.6766, 0.8376, 0.8376, 0.2899, 0.4833\} \]

\[ A^{(5)} \text{Tr}(M)_{\text{Max(Weight)}} \rightarrow \{0, 0, 0, 0, 0, 0, 0, 0, 0\} = A^{(5)}_2 \]

\[ A^{(5)} \text{Tr}(M)_{\text{average}} = \{0.6540, 0.9343, 0.8096, 0.46715, 0, 0.8096, 0.6540, 0.6540, 0.8096\} \]

\[ A^{(5)} \text{Tr}(M)_{\text{Max(Weight)}} \rightarrow \{0, 1, 0, 0, 0, 0, 0, 0, 0\} = A^{(5)}_3 \]

\[ A^{(5)} = A^{(5)}_3 \text{(fixed point)} \]

**Step: 6** Attribute TrC6 is ON:

\[ A^{(6)} = \{0, 0, 0, 0, 0, 0, 0, 0, 0, 0\} \]

\[ A^{(6)} \text{Tr}(M)_{\text{Weight}} = (0.5, 0.7, 0.9), (0.5, 0.7, 0.9), (0.7, 0.9, 1), (0.1, 0.3, 0.5), (0.7, 0.9, 1), (0), (0.9, 1, 1), (0.7, 0.9, 1), (0.3, 0.5, 0.7), (0.7, 0.9, 1), (0.7, 0.9, 1) \]

\[ A^{(6)} \text{Tr}(M)_{\text{average}} = \{0.7, 0.7, 0.8666, 0.3, 0.8666, 0, 0.9666, 0.8666, 0.5, 0.8666, 0.7\} \]

\[ A^{(6)} \text{Tr}(M)_{\text{Max(Weight)}} \rightarrow \{0, 0, 0, 0, 0, 1, 0, 0\} = A^{(6)}_1 \]
\[ \text{Step:7 Attribute TrC}_7 \text{ is ON:} \]
\[ A_1^{(7)} \text{Tr(M)}_{\text{average}} = \{0.6766, 0.8376, 0.8376, 0.4833, 0.6766, 0.9343, 0, 0.8376, 0.4833, 0.4833, 0.6766\} \]
\[ A_1^{(7)} \text{Tr(M)}_{\text{Max(Weight)} \to \{0 0 0 0 1 0 0 0 0\}} = A_2^{(7)} \]
\[ A_2^{(7)} \text{Tr(M)}_{\text{average}} = \{0.6540, 0.6540, 0.8086, 0.2802, 0.8096, 0, 0.9343, 0.8096, 0.4671, 0.8096, 0.6540\} \]
\[ A_2^{(7)} \text{Tr(M)}_{\text{Max(Weight)} \to \{0 0 0 0 0 1 0 0 0\}} = A_3^{(7)} \]
\[ A_3^{(7)} = A_3^{(7)} \text{(Fixed Point)} \]
Step:8 Attribute TrC₈ is ON:

\[ A^{(8)} = \{0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 1 \ 0 \ 0 \ 0 \} \]
\[ A^{(8)} \text{Tr(M)} \text{Weight} = (0.5,0.7,0.9), (0.7,0.9,1), (0.7,0.9,1), (0.5,0.7,0.9), (0.5,0.7,0.9), (0.5,0.7,0.9), (0.7,0.9,1), (0.7,0.9,1), (0), (0.3,0.5,0.7), (0.3,0.5,0.7) \]
\[ A^{(8)} \text{Tr(M)} \text{average} = [0.7, 0.8666, 0.8666, 0.7, 0.7, 0.8666, 0.8666, 0, 0.9666, 0.5, 0.5] \]
\[ A^{(8)} \text{Tr(M)} \text{Max(Weight)} \rightarrow [0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 1 \ 0 \ 0] = A^{(8)}_1 \]
\[ A^{(8)}_1 \text{Tr(M)} \text{average} = [0.8376, 0.8376, 0.4833, 0.4833, 0.8376, 0.4833, 0.4833, 0.9343, 0, 0.4833] \]
\[ A^{(8)}_1 \text{Tr(M)} \text{Max(Weight)} \rightarrow [0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 1 \ 0 \ 0] = A^{(8)}_2 \]

\[ A^{(8)} = A^{(8)}_2 \] (fixed point)

Step:9 Attribute TrC₉ is ON:

\[ A^{(9)} = \{0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 1 \ 0 \ 0 \ 0 \} \]
\[ A^{(9)} \text{Tr(M)} \text{Weight} = (0.7,0.9,1), (0.7,0.9,1), (0.3,0.5,0.7), (0.3,0.5,0.7), (0.7,0.9,1), (0.3,0.5,0.7), (0.3,0.5,0.7), (0.7,1,1), (0) (0.3,0.5,0.7), (0.3,0.5,0.7) \]
\[ A^{(9)} \text{Tr(M)} \text{average} = [0.8666, 0.8666, 0.5, 0.5, 0.8666, 0.5, 0.5, 0.9666, 0, 0.5, 0.5] \]
\[ A^{(9)} \text{Tr(M)} \text{Max(Weight)} \rightarrow = [0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 1 \ 0 \ 0 \ 0] = A^{(9)}_1 \]
\[ A^{(9)}_1 \text{Tr}(M)_{\text{average}} = \{0.6766, \ 0.8376, \ 0.8376, \ 0.6766, \ 0.6766, \ 0.8376, \ 0.8376, \ 0, \ 0.9343, \ 0.4833, \ 0.4833\} \]

\[ A^{(9)}_1 \text{Tr}(M)_{\text{Max(Weight)}} \rightarrow \{0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 1 \ 0 \ 0\} = A^{(9)}_2 \]

\[ A^{(9)} = A^{(9)}_2 \]

**Step: 10** Attribute TrC_{10} is ON:

\[ A^{(10)} = \{0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 1 \ 0 \ 0\} \]

\[ A^{(10)} \text{Tr}(M)_{\text{Weight}} = (0.9,1,1), (0.1,0.3,0.5), (0.7,0.9,1), (0.7,0.9,1), (0.7,0.9,1), (0.7,0.5,0.7), (0.3,0.5,0.7), (0.3,0.5,0.7), (0), (0.3,0.5,0.7) \} \]

\[ A^{(10)} \text{Tr}(M)_{\text{average}} = \{0.9666, \ 0.8666, \ 0.8666, \ 0.7, \ 0.8666, \ 0.5, \ 0.5, \ 0.5, \ 0, \ 0.5\}. \]

\[ A^{(10)} \text{Tr}(M)_{\text{Max(Weight)}} \rightarrow \{1 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0\} = A^{(10)}_1 \]

\[ A^{(10)}_1 \text{Tr}(M)_{\text{average}} = \{0, \ 0.8376, \ 0.8376, \ 0.6766, \ 0.6766, \ 0.6766, \ 0.6766, \ 0.8376, \ 0.8376, \ 0.9343, \ 0.8376\} \]

\[ A^{(10)}_1 \text{Tr}(M)_{\text{Max(Weight)}} \rightarrow \{0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0\} = A^{(10)}_2 \]

\[ A^{(10)} = A^{(10)}_2 \]

**Step: 11** Attribute TrC_{11} is ON:

\[ A^{(11)} = \{0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 1\}. \]

\[ A^{(11)} \text{Tr}(M)_{\text{Weight}} = \{(0.7,0.9,1), (0.3,0.5,0.7), (0.7,0.9,1), (0.7,0.9,1), (0.9,1,1), (0.5,0.7,0.9), (0.3,0.5,0.7), (0.3,0.5,0.7), (0.3,0.5,0.7), (0) \} \]
\[ A^{(1)} \text{Tr}(M)_{\text{average}} = \{0.866, 0.5, 0.8666, 0.966, 0.7, 0.5, 0.5, 0.5, 0.5, 0\} \]
\[ A^{(1)} \text{Tr}(M)_{\text{Max(Weight)}} \rightarrow \{0 \ 0 \ 0 \ 1 \ 0 \ 0 \ 0 \ 0 \} = A^{(1)}_1 \]
\[ A^{(1)}_1 \text{Tr}(M)_{\text{average}} = \{0.6766, 0.9343, 0.8376, 0.4833, 0, 0.8376, 0.6766, 0.6766, 0.6766, 0.8376\} \]
\[ A^{(1)}_1 \text{Tr}(M)_{\text{Max(Weight)}} \rightarrow \{01 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \ 0 \} = A^{(1)}_2 \]
\[ A^{(1)}_2 \text{Tr}(M)_{\text{average}} = \{0.866, 0.4671, 0.4671, 0.4671, 0.9030, 0.6540, 0.8096, 0.8096, 0.2802, 0.4671\} \]
\[ A^{(1)}_2 \text{Tr}(M)_{\text{Max(Weight)}} \rightarrow \{00 \ 0 \ 0 \ 1 \ 0 \ 0 \ 0 \ 0 \} = A^{(1)}_3 \]
\[ A^{(1)}_1 = A^{(1)}_3 \] (fixed point).
Weightage of the attributes

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$Totalaverageweight$ 0.6936 0.570 0.7294 0.5388 0.6349 0.5999 0.7071 0.5903 0.6319 0.5129 0.6090
8.9 CONCLUSION

Using a new fuzzy model Triangular Fuzzy Cognitive Maps (TrNCMs) enabled the ranking of the Miracles through Holy Bible as Faith (0.7294), Hearing the word of God (0.7071), Persistence/Perseverance in prayer (0.6936), God’s Compassion (0.6349), Love (0.6319), Repentance (0.6090), Forgiveness (0.5999), Humility (0.5903), Patience (0.5700), Authority in the spiritual realm (0.5388), Obedience (0.5129). When Neutrosophic Cognitive Maps (NCM) was used the above causes are ON stage and indeterminacy of relations between any two concepts. But this new model gave the ranking of the causes of the problem. This is the beauty of this Triangular Neutrosophic Cognitive Maps (TrNCM).