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(Neutrosophic) SuperHyperAlliances With SuperHyperDefensive and SuperHyperOffensive Type-SuperHyperSet On (Neutrosophic) SuperHyperGraph With (Neutrosophic) SuperHyperModeling of Cancer's Recognitions And Related (Neutrosophic) SuperHyperClasses

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1 Abstract

In this research, new setting is introduced for new SuperHyperNotions, namely, SuperHyperAlliances and Neutrosophic SuperHyperAlliances. Two different types of SuperHyperDefinitions are debut for them but the research goes further and the SuperHyperNotion, SuperHyperUniform, and SuperHyperClass based on that are well-defined and well-reviewed. The literature review is implemented in the whole of this research. For shining the elegancy and the significancy of this research, the comparison between this SuperHyperNotion with other SuperHyperNotions and fundamental SuperHyperNumbers are featured. The definitions are followed by the examples and the instances thus the clarifications are driven with different tools. The applications are figured out to make sense about the theoretical aspect of this ongoing research. The "Cancer's Recognitions" are the under research to figure out the challenges make sense about ongoing and upcoming research. The special case is up. The cells are viewed in the deemed ways. There are different types of them. Some of them are individuals and some of them are well-modeled by the group of cells. These types are all officially called "SuperHyperVertex" but the relations amid them all officially called "SuperHyperEdge". The frameworks "SuperHyperGraph" and "neutrosophic SuperHyperGraph" are chosen and elected to research about "Cancer's Recognitions". Thus these complex and dense SuperHyperModels open up some avenues to research on theoretical segments and "Cancer's Recognitions". Some avenues are posed to pursue this research. It's also officially collected in the form of some questions and some problems. Assume a SuperHyperGraph. An "SuperHyperAlliance" is a minimal SuperHyperSet of SuperHyperVertices with minimum cardinality such that either of the following expressions hold for the cardinalities of SuperHyperNeighbors of $s \in S$:, $|S \cap N(s)| > |S \cap (V \setminus N(s))|$, and $|S \cap N(s)| < |S \cap (V \setminus N(s))|$. The first Expression, holds if S is SuperHyperOffensive. And the second Expression, holds if S is "SuperHyperDefensive". It's useful to define "neutrosophic" version of SuperHyperAlliances. Since there's more ways to get type-results to make SuperHyperAlliances more understandable. For the sake of having neutrosophic SuperHyperAlliances, there's a need to "redefine" the notion of "SuperHyperAlliances".

The SuperHyperVertices and the SuperHyperEdges are assigned by the labels from the letters of the alphabets. In this procedure, there's the usage of the position of labels to assign to the values. Assume a SuperHyperAlliance. It's redefined neutrosophic SuperHyperAlliance if the mentioned Table holds, concerning, "The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperGraph" with the key points, "The Values of The Vertices & The Number of Position in Alphabet", "The Values of The SuperVertices&The Minimum Values of Its Vertices", "The Values of The Edges&The Minimum Values of Its Vertices", "The Values of The HyperEdges&The Minimum Values of Its Vertices", "The Values of The SuperHyperEdges&The Minimum Values of Its Endpoints". To get structural examples and instances, I'm going to introduce the next SuperHyperClass of SuperHyperGraph based on SuperHyperAlliances. It's the main. It'll be disciplinary to have the foundation of previous definition in the kind of SuperHyperClass. If there's a need to have all SuperHyperConnectivities until the SuperHyperAlliances, then it's officially called "SuperHyperAlliances" but otherwise, it isn't SuperHyperAlliances. There are some instances about the clarifications for the main definition titled "SuperHyperAlliances". These two examples get more scrutiny and discernment since there are characterized in the disciplinary ways of the SuperHyperClass based on SuperHyperAlliances. For the sake of having neutrosophic SuperHyperAlliances, there's a need to "redefine" the notion of "neutrosophic SuperHyperAlliances" and "neutrosophic SuperHyperAlliances". The SuperHyperVertices and the SuperHyperEdges are assigned by the labels from the letters of the alphabets. In this procedure, there's the usage of the position of labels to assign to the values. Assume a neutrosophic SuperHyperGraph. It's redefined "neutrosophic SuperHyperGraph" if the intended Table holds. And SuperHyperAlliances are redefined "neutrosophic SuperHyperAlliances" if the intended Table holds. It's useful to define "neutrosophic" version of SuperHyperClasses. Since there's more ways to get neutrosophic type-results to make neutrosophic SuperHyperAlliances more understandable. Assume a neutrosophic SuperHyperGraph. There are some neutrosophic SuperHyperClasses if the intended Table holds. Thus SuperHyperPath, SuperHyperCycle, SuperHyperStar, SuperHyperBipartite, SuperHyperMultiPartite, and SuperHyperWheel, are "neutrosophic SuperHyperPath", "neutrosophic SuperHyperCycle", "neutrosophic SuperHyperStar", "neutrosophic SuperHyperBipartite", "neutrosophic SuperHyperMultiPartite", and "neutrosophic SuperHyperWheel" if the intended Table holds. A SuperHyperGraph has "neutrosophic SuperHyperAlliances" where it's the strongest [the maximum neutrosophic value from all SuperHyperAlliances amid the maximum value amid all SuperHyperVertices from a SuperHyperAlliances.] SuperHyperAlliances. A graph is SuperHyperUniform if it's SuperHyperGraph and the number of elements of SuperHyperEdges are the same. Assume a neutrosophic SuperHyperGraph. There are some SuperHyperClasses as follows. It's SuperHyperPath if it's only one SuperVertex as intersection amid two given SuperHyperEdges with two exceptions; it's SuperHyperCycle if it's only one SuperVertex as intersection amid two given SuperHyperEdges; it's SuperHyperStar it's only one SuperVertex as intersection amid all SuperHyperEdges; it's SuperHyperBipartite it's only one SuperVertex as intersection amid two given SuperHyperEdges and these SuperVertices, forming two separate sets, has no SuperHyperEdge in common; it's SuperHyperMultiPartite it's only one SuperVertex as intersection amid two given SuperHyperEdges and these SuperVertices, forming multi separate sets, has no SuperHyperEdge in common; it's SuperHyperWheel if it's only one SuperVertex as intersection amid two given SuperHyperEdges and one SuperVertex has one SuperHyperEdge with any common SuperVertex. The SuperHyperModel proposes the specific designs and the specific architectures. The SuperHyperModel is officially called "SuperHyperGraph" and "Neutrosophic SuperHyperGraph". In this SuperHyperModel, The "specific" cells and

"specific group" of cells are SuperHyperModeled as "SuperHyperVertices" and the common and intended properties between "specific" cells and "specific group" of cells are SuperHyperModeled as "SuperHyperEdges". Sometimes, it's useful to have some degrees of determinacy, indeterminacy, and neutrality to have more precise SuperHyperModel which in this case the SuperHyperModel is called "neutrosophic". In the future research, the foundation will be based on the "Cancer's Recognitions" and the results and the definitions will be introduced in redeemed ways. The recognition of the cancer in the long-term function. The specific region has been assigned by the model [it's called SuperHyperGraph] and the long cycle of the move from the cancer is identified by this research. Sometimes the move of the cancer hasn't be easily identified since there are some determinacy, indeterminacy and neutrality about the moves and the effects of the cancer on that region; this event leads us to choose another model [it's said to be neutrosophic SuperHyperGraph] to have convenient perception on what's happened and what's done. There are some specific models, which are well-known and they've got the names, and some SuperHyperGeneral SuperHyperModels. The moves and the traces of the cancer on the complex tracks and between complicated groups of cells could be fantasized by a neutrosophic SuperHyperPath(-/SuperHyperCycle, SuperHyperStar, SuperHyperBipartite, SuperHyperMultipartite, SuperHyperWheel). The aim is to find either the longest SuperHyperAlliances or the strongest SuperHyperAlliances in those neutrosophic SuperHyperModels. For the longest SuperHyperAlliances, called SuperHyperAlliances, and the strongest SuperHyperCycle, called neutrosophic SuperHyperAlliances, some general results are introduced. Beyond that in SuperHyperStar, all possible SuperHyperPaths have only two SuperHyperEdges but it's not enough since it's essential to have at least three SuperHyperEdges to form any style of a SuperHyperCycle. There isn't any formation of any SuperHyperCycle but literarily, it's the deformation of any SuperHyperCycle. It, literarily, deforms and it doesn't form. A basic familiarity with SuperHyperGraph theory and neutrosophic SuperHyperGraph theory are proposed.

Keywords: (Neutrosophic) SuperHyperGraph, (Neutrosophic) SuperHyperAlliances, Cancer's Recognitions
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2 Background

There are some researches covering the topic of this research. In what follows, there are some discussion and literature reviews about them.

First article is titled "properties of SuperHyperGraph and neutrosophic SuperHyperGraph" in **Ref.** [1] by Henry Garrett (2022). It's first step toward the research on neutrosophic SuperHyperGraphs. This research article is published on the journal "Neutrosophic Sets and Systems" in issue 49 and the pages 531-561. In this research article, different types of notions like dominating, resolving, coloring, Eulerian(Hamiltonian) neutrosophic path, n-Eulerian(Hamiltonian) neutrosophic path, zero forcing number, zero forcing neutrosophic- number, independent number, independent neutrosophic-number, clique number, clique neutrosophic-number, matching number, matching neutrosophic-number, girth, neutrosophic girth, 1-zero-forcing number, 1-zero- forcing neutrosophic-number, failed 1-zero-forcing number, failed 1-zero-forcing neutrosophic-number, global- offensive alliance, t-offensive alliance, t-defensive alliance, t-powerful alliance, and global-powerful alliance are defined in SuperHyperGraph and neutrosophic SuperHyperGraph. Some Classes of SuperHyperGraph and Neutrosophic SuperHyperGraph are cases of research. Some results are applied in family of SuperHyperGraph and neutrosophic SuperHyperGraph.

Thus this research article has concentrated on the vast notions and introducing the majority of notions.

The seminal paper and groundbreaking article is titled "neutrosophic co-degree and neutrosophic degree alongside chromatic numbers in the setting of some classes related to neutrosophic hypergraphs" in **Ref.** [2] by Henry Garrett (2022). In this research article, a novel approach is implemented on SuperHyperGraph and neutrosophic SuperHyperGraph based on general forms without using neutrosophic classes of neutrosophic SuperHyperGraph. It's published in prestigious and fancy journal is entitled "Journal of Current Trends in Computer Science Research (JCTCSR)" with abbreviation "J Curr Trends Comp Sci Res" in volume 1 and issue 1 with pages 06-14. The research article studies deeply with choosing neutrosophic hypergraphs instead of neutrosophic SuperHyperGraph. It's the breakthrough toward independent results based on initial background.

In some articles are titled "Some SuperHyperDegrees and Co-SuperHyperDegrees on Neutrosophic SuperHyperGraphs and SuperHyperGraphs Alongside Applications in Cancer's Treatments" in **Ref.** [3] by Henry Garrett (2022), "SuperHyperDominating and SuperHyperResolving on Neutrosophic SuperHyperGraphs And Their Directions in Game Theory and Neutrosophic SuperHyperClasses" in **Ref.** [4] by Henry Garrett (2022), "(Neutrosophic) SuperHyperDefensive SuperHyperAlliances With SuperHyperDefensive and SuperHyperOffensive Type-SuperHyperSet On (Neutrosophic) SuperHyperGraph With (Neutrosophic) SuperHyperModeling of Cancer's Recognitions And Related (Neutrosophic) SuperHyperClasses" in **Ref.** [5] by Henry Garrett (2022), "SuperHyperGirth on SuperHyperGraph and Neutrosophic SuperHyperGraph With SuperHyperModeling of Cancer's Recognitions" in **Ref.** [6] by Henry Garrett (2022), "Basic Neutrosophic Notions Concerning SuperHyperDominating and Neutrosophic SuperHyperResolving in SuperHyperGraph" in **Ref.** [7] by Henry Garrett (2022), "Initial Material of Neutrosophic Preliminaries to Study Some Neutrosophic Notions Based on Neutrosophic SuperHyperEdge (NSHE) in Neutrosophic SuperHyperGraph (NSHG)" in **Ref.** [8] by Henry Garrett (2022), there are some endeavors to formalize the basic SuperHyperNotions about neutrosophic SuperHyperGraph and SuperHyperGraph.

Some studies and researches about neutrosophic graphs, are proposed as book in **Ref.** [9] by Henry Garrett (2022) which is indexed by Google Scholar and has more than 2347 readers in Scribd. It's titled "Beyond Neutrosophic Graphs" and published by Ohio: E-publishing: Educational Publisher 1091 West 1st Ave Grandview Heights, Ohio 43212 United State. This research book covers different types of notions and settings in neutrosophic graph theory and neutrosophic SuperHyperGraph theory.

Also, some studies and researches about neutrosophic graphs, are proposed as book in **Ref.** [10] by Henry Garrett (2022) which is indexed by Google Scholar and has more than 3048 readers in Scribd. It's titled "Neutrosophic Duality" and published by Florida: GLOBAL KNOWLEDGE - Publishing House 848 Brickell Ave Ste 950 Miami, Florida 33131 United States. This research book presents different types of notions SuperHyperResolving and SuperHyperDominating in the setting of duality in neutrosophic graph theory and neutrosophic SuperHyperGraph theory. This research book has scrutiny on the complement of the intended set and the intended set, simultaneously. It's smart to consider a set but acting on its complement that what's done in this research book which is popular in the terms of high readers in Scribd.

2.1 Motivation and Contributions

In this research, there are some ideas in the featured frameworks of motivations. I try to bring the motivations in the narrative ways. Some cells have been faced with some attacks from the situation which is caused by the cancer's attacks. In this case, there are some embedded analysis on the ongoing situations which in that, the cells could be

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labelled as some groups and some groups or individuals have excessive labels which all are raised from the behaviors to overcome the cancer's attacks. In the embedded situations, the individuals of cells and the groups of cells could be considered as "new groups". Thus it motivates us to find the proper SuperHyperModels for getting more proper analysis on this messy story. I've found the SuperHyperModels which are officially called "SuperHyperGraphs" and "Neutrosophic SuperHyperGraphs". In this SuperHyperModel, the cells and the groups of cells are defined as "SuperHyperVertices" and the relations between the individuals of cells and the groups of cells are defined as "SuperHyperEdges". Thus it's another motivation for us to do research on this SuperHyperModel based on the "Cancer's Recognitions". Sometimes, the situations get worst. The situation is passed from the certainty and precise style. Thus it's the beyond them. There are three descriptions, namely, the degrees of determinacy, indeterminacy and neutrality, for any object based on vague forms, namely, incomplete data, imprecise data, and uncertain analysis. The latter model could be considered on the previous SuperHyperModel. It's SuperHyperModel. It's SuperHyperGraph but it's officially called "Neutrosophic SuperHyperGraphs". The cancer is the disease but the model is going to figure out what's going on this phenomenon. The special case of this disease is considered and as the consequences of the model, some parameters are used. The cells are under attack of this disease but the moves of the cancer in the special region are the matter of mind. The recognition of the cancer could help to find some treatments for this disease. The SuperHyperGraph and neutrosophic SuperHyperGraph are the SuperHyperModels on the "Cancer's Recognitions" and both bases are the background of this research. Sometimes the cancer has been happened on the region, full of cells, groups of cells and embedded styles. In this segment, the SuperHyperModel proposes some SuperHyperNotions based on the connectivities of the moves of the cancer in the forms of alliances' styles with the formation of the design and the architecture are formally called "SuperHyperAlliances" in the themes of jargons and buzzwords. The prefix "SuperHyper" refers to the theme of the embedded styles to figure out the background for the SuperHyperNotions. The recognition of the cancer in the long-term function. The specific region has been assigned by the model [it's called SuperHyperGraph] and the long cycle of the move from the cancer is identified by this research. Sometimes the move of the cancer hasn't be easily identified since there are some determinacy, indeterminacy and neutrality about the moves and the effects of the cancer on that region; this event leads us to choose another model [it's said to be neutrosophic SuperHyperGraph] to have convenient perception on what's happened and what's done. There are some specific models, which are well-known and they've got the names, and some general models. The moves and the traces of the cancer on the complex tracks and between complicated groups of cells could be fantasized by a neutrosophic SuperHyperPath(-/SuperHyperCycle, SuperHyperStar, SuperHyperBipartite, SuperHyperMultipartite, SuperHyperWheel). The aim is to find either the optimal SuperHyperAlliances or the neutrosophic SuperHyperAlliances in those neutrosophic SuperHyperModels. Some general results are introduced. Beyond that in SuperHyperStar, all possible SuperHyperPaths have only two SuperHyperEdges but it's not enough since it's essential to have at least three SuperHyperEdges to form any style of a SuperHyperCycle. There isn't any formation of any SuperHyperCycle but literarily, it's the deformation of any SuperHyperCycle. It, literarily, deforms and it doesn't form.

Question 2.1. *How to define the SuperHyperNotions and to do research on them to find the " amount of SuperHyperAlliances" of either individual of cells or the groups of cells based on the fixed cell or the fixed group of cells, extensively, the "amount of SuperHyperAlliances" based on the fixed groups of cells or the fixed groups of group of cells?*

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Question 2.2. *What are the best descriptions for the "Cancer's Recognitions" in terms of these messy and dense SuperHyperModels where embedded notions are illustrated?*

It's motivation to find notions to use in this dense model is titled "SuperHyperGraphs". Thus it motivates us to define different types of "SuperHyperAlliances" and "neutrosophic SuperHyperAlliances" on "SuperHyperGraph" and "Neutrosophic SuperHyperGraph". Then the research has taken more motivations to define SuperHyperClasses and to find some connections amid this SuperHyperNotion with other SuperHyperNotions. It motivates us to get some instances and examples to make clarifications about the framework of this research. The general results and some results about some connections are some avenues to make key point of this research, "Cancer's Recognitions", more understandable and more clear.

The framework of this research is as follows. In the beginning, I introduce basic definitions to clarify about preliminaries. In the subsection "Preliminaries", initial definitions about SuperHyperGraphs and neutrosophic SuperHyperGraph are deeply-introduced and in-depth-discussed. The elementary concepts are clarified and illustrated completely and sometimes review literature are applied to make sense about what's going to figure out about the upcoming sections. The main definitions and their clarifications alongside some results about new notions, SuperHyperAlliances and neutrosophic SuperHyperAlliances, are figured out in sections "SuperHyperAlliances" and "Neutrosophic SuperHyperAlliances". In the sense of tackling on getting results and in order to make sense about continuing the research, the ideas of SuperHyperUniform and Neutrosophic SuperHyperUniform are introduced and as their consequences, corresponded SuperHyperClasses are figured out to debut what's done in this section, titled "Results on SuperHyperClasses" and "Results on Neutrosophic SuperHyperClasses". As going back to origin of the notions, there are some smart steps toward the common notions to extend the new notions in new frameworks, SuperHyperGraph and Neutrosophic SuperHyperGraph, in the sections "Results on SuperHyperClasses" and "Results on Neutrosophic SuperHyperClasses". The starter research about the general SuperHyperRelations and as concluding and closing section of theoretical research are contained in the section "General Results". Some general SuperHyperRelations are fundamental and they are well-known as fundamental SuperHyperNotions as elicited and discussed in the sections, "General Results", "SuperHyperAlliances", "Neutrosophic SuperHyperAlliances", "Results on SuperHyperClasses" and "Results on Neutrosophic SuperHyperClasses". There are curious questions about what's done about the SuperHyperNotions to make sense about excellency of this research and going to figure out the word "best" as the description and adjective for this research as presented in section, "SuperHyperAlliances". The keyword of this research debut in the section "Applications in Cancer's Recognitions" with two cases and subsections "Case 1: The Initial Steps Toward SuperHyperBipartite as SuperHyperModel" and "Case 2: The Increasing Steps Toward SuperHyperMultipartite as SuperHyperModel". In the section, "Open Problems", there are some scrutiny and discernment on what's done and what's happened in this research in the terms of "questions" and "problems" to make sense to figure out this research in featured style. The advantages and the limitations of this research alongside about what's done in this research to make sense and to get sense about what's figured out are included in the section, "Conclusion and Closing Remarks".

2.2 Preliminaries

In this subsection, the basic material which is used in this research, is presented. Also, the new ideas and their clarifications are elicited.

Definition 2.3 (Neutrosophic Set)**.** (**Ref.** [12],Definition 2.1,p.87).

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Let X be a space of points (objects) with generic elements in X denoted by x; then the **neutrosophic set** A (NS A) is an object having the form

$$A = \{< x : T_A(x), I_A(x), F_A(x) >, x \in X\}$$

where the functions $T, I, F : X \rightarrow]^{-}0, 1^{+}[$ define respectively the a **truth-membership function**, an **indeterminacy-membership function**, and a **falsity-membership function** of the element $x \in X$ to the set A with the condition

$$^{-}0 \leq T_A(x) + I_A(x) + F_A(x) \leq 3^{+}.$$

The functions $T_A(x), I_A(x)$ and $F_A(x)$ are real standard or nonstandard subsets of $]^{-}0, 1^{+}[$.

Definition 2.4 (Single Valued Neutrosophic Set)**.** (**Ref.** [15],Definition 6,p.2).

Let X be a space of points (objects) with generic elements in X denoted by x. A **single valued neutrosophic set** A (SVNS A) is characterized by truth-membership function $T_A(x)$, an indeterminacy-membership function $I_A(x)$, and a falsity-membership function $F_A(x)$. For each point x in X, $T_A(x), I_A(x), F_A(x) \in [0, 1]$. A SVNS A can be written as

$$A = \{< x : T_A(x), I_A(x), F_A(x) >, x \in X\}.$$

Definition 2.5. The **degree of truth-membership**, **indeterminacy-membership** and **falsity-membership of the subset** $X \subset A$ of the single valued neutrosophic set $A = \{< x : T_A(x), I_A(x), F_A(x) >, x \in X\}$:

$$T_A(X) = \min[T_A(v_i), T_A(v_j)]_{v_i, v_j \in X},$$

$$I_A(X) = \min[I_A(v_i), I_A(v_j)]_{v_i, v_j \in X},$$

$$\text{and } F_A(X) = \min[F_A(v_i), F_A(v_j)]_{v_i, v_j \in X}.$$

Definition 2.6. The **support** of $X \subset A$ of the single valued neutrosophic set $A = \{< x : T_A(x), I_A(x), F_A(x) >, x \in X\}$:

$$supp(X) = \{x \in X : \ T_A(x), I_A(x), F_A(x) > 0\}.$$

Definition 2.7 (Neutrosophic SuperHyperGraph (NSHG))**.** (**Ref.** [14],Definition 3,p.291).

Assume V' is a given set. A **neutrosophic SuperHyperGraph** (NSHG) S is an ordered pair $S = (V, E)$, where

(i) $V = \{V_1, V_2, \ldots, V_n\}$ a finite set of finite single valued neutrosophic subsets of V';

(ii) $V = \{(V_i, T_{V'}(V_i), I_{V'}(V_i), F_{V'}(V_i)) : \ T_{V'}(V_i), I_{V'}(V_i), F_{V'}(V_i) \geq 0\}, \ (i = 1, 2, \ldots, n)$;

(iii) $E = \{E_1, E_2, \ldots, E_{n'}\}$ a finite set of finite single valued neutrosophic subsets of V;

(iv) $E = \{(E_{i'}, T'_V(E_{i'}), I'_V(E_{i'}), F'_V(E_{i'})) : \ T'_V(E_{i'}), I'_V(E_{i'}), F'_V(E_{i'}) \geq 0\}, \ (i' = 1, 2, \ldots, n')$;

(v) $V_i \neq \emptyset, \ (i = 1, 2, \ldots, n)$;

(vi) $E_{i'} \neq \emptyset, \ (i' = 1, 2, \ldots, n')$;

(vii) $\sum_i supp(V_i) = V, \ (i = 1, 2, \ldots, n)$;

$(viii)$ $\sum_{i'} supp(E_{i'}) = V, \ (i' = 1, 2, \ldots, n')$;

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(ix) and the following conditions hold:

$$T'_V(E_{i'}) \leq \min[T_{V'}(V_i), T_{V'}(V_j)]_{V_i,V_j \in E_{i'}},$$
$$I'_V(E_{i'}) \leq \min[I_{V'}(V_i), I_{V'}(V_j)]_{V_i,V_j \in E_{i'}},$$
$$\text{and } F'_V(E_{i'}) \leq \min[F_{V'}(V_i), F_{V'}(V_j)]_{V_i,V_j \in E_{i'}}$$

where $i' = 1, 2, \ldots, n'$.

Here the neutrosophic SuperHyperEdges (NSHE) $E_{j'}$ and the neutrosophic SuperHyperVertices (NSHV) V_j are single valued neutrosophic sets. $T_{V'}(V_i), I_{V'}(V_i)$, and $F_{V'}(V_i)$ denote the degree of truth-membership, the degree of indeterminacy-membership and the degree of falsity-membership the neutrosophic SuperHyperVertex (NSHV) V_i to the neutrosophic SuperHyperVertex (NSHV) V. $T'_V(E_{i'}), T'_V(E_{i'})$, and $T'_V(E_{i'})$ denote the degree of truth-membership, the degree of indeterminacy-membership and the degree of falsity-membership of the neutrosophic SuperHyperEdge (NSHE) $E_{i'}$ to the neutrosophic SuperHyperEdge (NSHE) E. Thus, the ii'th element of the **incidence matrix** of neutrosophic SuperHyperGraph (NSHG) are of the form $(V_i, T'_V(E_{i'}), I'_V(E_{i'}), F'_V(E_{i'}))$, the sets V and E are crisp sets.

Definition 2.8 (Characterization of the Neutrosophic SuperHyperGraph (NSHG))**.** (**Ref.** [14],Section 4,pp.291-292).

Assume a neutrosophic SuperHyperGraph (NSHG) S is an ordered pair $S = (V, E)$. The neutrosophic SuperHyperEdges (NSHE) $E_{i'}$ and the neutrosophic SuperHyperVertices (NSHV) V_i of neutrosophic SuperHyperGraph (NSHG) $S = (V, E)$ could be characterized as follow-up items.

(i) If $|V_i| = 1$, then V_i is called **vertex**;

(ii) if $|V_i| \geq 1$, then V_i is called **SuperVertex**;

(iii) if for all V_is are incident in $E_{i'}$, $|V_i| = 1$, and $|E_{i'}| = 2$, then $E_{i'}$ is called **edge**;

(iv) if for all V_is are incident in $E_{i'}$, $|V_i| = 1$, and $|E_{i'}| \geq 2$, then $E_{i'}$ is called **HyperEdge**;

(v) if there's a V_i is incident in $E_{i'}$ such that $|V_i| \geq 1$, and $|E_{i'}| = 2$, then $E_{i'}$ is called **SuperEdge**;

(vi) if there's a V_i is incident in $E_{i'}$ such that $|V_i| \geq 1$, and $|E_{i'}| \geq 2$, then $E_{i'}$ is called **SuperHyperEdge**.

If we choose different types of binary operations, then we could get hugely diverse types of general forms of neutrosophic SuperHyperGraph (NSHG).

Definition 2.9 (t-norm)**.** (**Ref.** [13], Definition 5.1.1, pp.82-83).

A binary operation $\otimes : [0, 1] \times [0, 1] \to [0, 1]$ is a ***t*-norm** if it satisfies the following for $x, y, z, w \in [0, 1]$:

(i) $1 \otimes x = x$;

(ii) $x \otimes y = y \otimes x$;

(iii) $x \otimes (y \otimes z) = (x \otimes y) \otimes z$;

(iv) If $w \leq x$ and $y \leq z$ then $w \otimes y \leq x \otimes z$.

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Definition 2.10. The **degree of truth-membership**, **indeterminacy-membership** and **falsity-membership of the subset** $X \subset A$ of the single valued neutrosophic set $A = \{< x : T_A(x), I_A(x), F_A(x) >, x \in X\}$ (with respect to t-norm T_{norm}):

$$T_A(X) = T_{norm}[T_A(v_i), T_A(v_j)]_{v_i,v_j \in X},$$

$$I_A(X) = T_{norm}[I_A(v_i), I_A(v_j)]_{v_i,v_j \in X},$$

$$\text{and } F_A(X) = T_{norm}[F_A(v_i), F_A(v_j)]_{v_i,v_j \in X}.$$

Definition 2.11. The **support** of $X \subset A$ of the single valued neutrosophic set $A = \{< x : T_A(x), I_A(x), F_A(x) >, x \in X\}$:

$$supp(X) = \{x \in X : \ T_A(x), I_A(x), F_A(x) > 0\}.$$

Definition 2.12. (General Forms of Neutrosophic SuperHyperGraph (NSHG)).

Assume V' is a given set. A **neutrosophic SuperHyperGraph** (NSHG) S is an ordered pair $S = (V, E)$, where

(i) $V = \{V_1, V_2, \ldots, V_n\}$ a finite set of finite single valued neutrosophic subsets of V';

(ii) $V = \{(V_i, T_{V'}(V_i), I_{V'}(V_i), F_{V'}(V_i)) : \ T_{V'}(V_i), I_{V'}(V_i), F_{V'}(V_i) \geq 0\}, \ (i = 1, 2, \ldots, n)$;

(iii) $E = \{E_1, E_2, \ldots, E_{n'}\}$ a finite set of finite single valued neutrosophic subsets of V;

(iv) $E = \{(E_{i'}, T'_V(E_{i'}), I'_V(E_{i'}), F'_V(E_{i'})) : \ T'_V(E_{i'}), I'_V(E_{i'}), F'_V(E_{i'}) \geq 0\}, \ (i' = 1, 2, \ldots, n')$;

(v) $V_i \neq \emptyset, \ (i = 1, 2, \ldots, n)$;

(vi) $E_{i'} \neq \emptyset, \ (i' = 1, 2, \ldots, n')$;

(vii) $\sum_i supp(V_i) = V, \ (i = 1, 2, \ldots, n)$;

$(viii)$ $\sum_{i'} supp(E_{i'}) = V, \ (i' = 1, 2, \ldots, n')$.

Here the neutrosophic SuperHyperEdges (NSHE) $E_{j'}$ and the neutrosophic SuperHyperVertices (NSHV) V_j are single valued neutrosophic sets. $T_{V'}(V_i), I_{V'}(V_i)$, and $F_{V'}(V_i)$ denote the degree of truth-membership, the degree of indeterminacy-membership and the degree of falsity-membership the neutrosophic SuperHyperVertex (NSHV) V_i to the neutrosophic SuperHyperVertex (NSHV) V. $T'_V(E_{i'}), T'_V(E_{i'})$, and $T'_V(E_{i'})$ denote the degree of truth-membership, the degree of indeterminacy-membership and the degree of falsity-membership of the neutrosophic SuperHyperEdge (NSHE) $E_{i'}$ to the neutrosophic SuperHyperEdge (NSHE) E. Thus, the ii'th element of the **incidence matrix** of neutrosophic SuperHyperGraph (NSHG) are of the form $(V_i, T'_V(E_{i'}), I'_V(E_{i'}), F'_V(E_{i'}))$, the sets V and E are crisp sets.

Definition 2.13 (Characterization of the Neutrosophic SuperHyperGraph (NSHG))**.** (**Ref.** [14],Section 4,pp.291-292).

Assume a neutrosophic SuperHyperGraph (NSHG) S is an ordered pair $S = (V, E)$. The neutrosophic SuperHyperEdges (NSHE) $E_{i'}$ and the neutrosophic SuperHyperVertices (NSHV) V_i of neutrosophic SuperHyperGraph (NSHG) $S = (V, E)$ could be characterized as follow-up items.

(i) If $|V_i| = 1$, then V_i is called **vertex**;

(ii) if $|V_i| \geq 1$, then V_i is called **SuperVertex**;

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(*iii*) if for all V_is are incident in $E_{i'}$, $|V_i| = 1$, and $|E_{i'}| = 2$, then $E_{i'}$ is called **edge**;

(*iv*) if for all V_is are incident in $E_{i'}$, $|V_i| = 1$, and $|E_{i'}| \geq 2$, then $E_{i'}$ is called **HyperEdge**;

(*v*) if there's a V_i is incident in $E_{i'}$ such that $|V_i| \geq 1$, and $|E_{i'}| = 2$, then $E_{i'}$ is called **SuperEdge**;

(*vi*) if there's a V_i is incident in $E_{i'}$ such that $|V_i| \geq 1$, and $|E_{i'}| \geq 2$, then $E_{i'}$ is called **SuperHyperEdge**.

3 SuperHyperAlliances

This SuperHyperModel is too messy and too dense. Thus there's a need to have some restrictions and conditions on SuperHyperGraph. The special case of this SuperHyperGraph makes the patterns and regularities.

Definition 3.1. A graph is **SuperHyperUniform** if it's SuperHyperGraph and the number of elements of SuperHyperEdges are the same.

To get more visions on SuperHyperAlliances, the some SuperHyperClasses are introduced. It makes to have SuperHyperAlliances more understandable.

Definition 3.2. Assume a neutrosophic SuperHyperGraph. There are some SuperHyperClasses as follows.

(i). It's **SuperHyperPath** if it's only one SuperVertex as intersection amid two given SuperHyperEdges with two exceptions;

(ii). it's **SuperHyperCycle** if it's only one SuperVertex as intersection amid two given SuperHyperEdges;

(iii). it's **SuperHyperStar** it's only one SuperVertex as intersection amid all SuperHyperEdges;

(iv). it's **SuperHyperBipartite** it's only one SuperVertex as intersection amid two given SuperHyperEdges and these SuperVertices, forming two separate sets, has no SuperHyperEdge in common;

(v). it's **SuperHyperMultiPartite** it's only one SuperVertex as intersection amid two given SuperHyperEdges and these SuperVertices, forming multi separate sets, has no SuperHyperEdge in common;

(vi). it's **SuperHyperWheel** if it's only one SuperVertex as intersection amid two given SuperHyperEdges and one SuperVertex has one SuperHyperEdge with any common SuperVertex.

Definition 3.3. Let an ordered pair $S = (V, E)$ be a neutrosophic SuperHyperGraph (NSHG) S. Then a sequence of neutrosophic SuperHyperVertices (NSHV) and neutrosophic SuperHyperEdges (NSHE)

$$V_1, E_1, V_2, E_2, V_3, \ldots, V_{s-1}, E_{s-1}, V_s$$

is called a **neutrosophic SuperHyperPath** (NSHP) from neutrosophic SuperHyperVertex (NSHV) V_1 to neutrosophic SuperHyperVertex (NSHV) V_s if either of following conditions hold:

(*i*) $V_i, V_{i+1} \in E_{i'}$;

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(*ii*) there's a vertex $v_i \in V_i$ such that $v_i, V_{i+1} \in E_{i'}$;

(*iii*) there's a SuperVertex $V_i' \in V_i$ such that $V_i', V_{i+1} \in E_{i'}$;

(*iv*) there's a vertex $v_{i+1} \in V_{i+1}$ such that $V_i, v_{i+1} \in E_{i'}$;

(*v*) there's a SuperVertex $V_{i+1}' \in V_{i+1}$ such that $V_i, V_{i+1}' \in E_{i'}$;

(*vi*) there are a vertex $v_i \in V_i$ and a vertex $v_{i+1} \in V_{i+1}$ such that $v_i, v_{i+1} \in E_{i'}$;

(*vii*) there are a vertex $v_i \in V_i$ and a SuperVertex $V_{i+1}' \in V_{i+1}$ such that $v_i, V_{i+1}' \in E_{i'}$;

(*viii*) there are a SuperVertex $V_i' \in V_i$ and a vertex $v_{i+1} \in V_{i+1}$ such that $V_i', v_{i+1} \in E_{i'}$;

(*ix*) there are a SuperVertex $V_i' \in V_i$ and a SuperVertex $V_{i+1}' \in V_{i+1}$ such that $V_i', V_{i+1}' \in E_{i'}$.

Definition 3.4. (Characterization of the Neutrosophic SuperHyperPaths).
Assume a neutrosophic SuperHyperGraph (NSHG) S is an ordered pair $S = (V, E)$. A neutrosophic SuperHyperPath (NSHP) from neutrosophic SuperHyperVertex (NSHV) V_1 to neutrosophic SuperHyperVertex (NSHV) V_s is sequence of neutrosophic SuperHyperVertices (NSHV) and neutrosophic SuperHyperEdges (NSHE)

$$V_1, E_1, V_2, E_2, V_3, \ldots, V_{s-1}, E_{s-1}, V_s,$$

could be characterized as follow-up items.

(*i*) If for all $V_i, E_{j'}$, $|V_i| = 1,\ |E_{j'}| = 2$, then NSHP is called **path**;

(*ii*) if for all $E_{j'}$, $|E_{j'}| = 2$, and there's V_i, $|V_i| \geq 1$, then NSHP is called **SuperPath**;

(*iii*) if for all $V_i, E_{j'}$, $|V_i| = 1,\ |E_{j'}| \geq 2$, then NSHP is called **HyperPath**;

(*iv*) if there are $V_i, E_{j'}$, $|V_i| \geq 1, |E_{j'}| \geq 2$, then NSHP is called **SuperHyperPath**.

Definition 3.5. Assume a SuperHyperGraph. An **SuperHyperAlliance** is a minimal SuperHyperSet of SuperHyperVertices with minimum cardinality such that either of the following expressions hold for the cardinalities of SuperHyperNeighbors of $s \in S$:

$$|S \cap N(s)| > |S \cap (V \setminus N(s))| \tag{3.1}$$
$$|S \cap N(s)| < |S \cap (V \setminus N(s))|. \tag{3.2}$$

The Expression (3.1), holds if S is **SuperHyperOffensive**. And the Expression (3.2), holds if S is **SuperHyperDefensive**.

Example 3.6. Assume the SuperHyperGraphs in the Figures (1), (2), (3), (4), (5), (6), (7), (8), (9), (10), (11), (12), (13), (14), (15), (16), (17), (18), (19), and (20).

- $S = \{A, B, C, D, E, F, G, H\}$ is the SuperHyperOffensive type-SuperHyperSet of the SuperHyperAlliance.
- $S = \{A, B, C, D, E, F, G, H\}$ is the SuperHyperOffensive type-SuperHyperSet of the SuperHyperAlliance.
- $S = \{A, B, C, D, E, F, H, I\}$ is the SuperHyperOffensive type-SuperHyperSet of the SuperHyperAlliance.
- $S = \{A, B, C, D, E, F, H, I\}$ is the SuperHyperOffensive type-SuperHyperSet of the SuperHyperAlliance.

- $S = \{V_1, V_2, V_3, V_4, V_5, V_6, V_7, V_8\}$ is the SuperHyperOffensive type-SuperHyperSet of the SuperHyperAlliance.
- $S = \{V_1, V_2, V_3, V_4, V_5, V_6, V_7, V_8, V_9, V_{10}, V_{21}\}$ and $S' = \{V_{11}, V_{12}, V_{13}, V_{14}, V_{15}, V_{16}, V_{17}, V_{18}, V_{19}, V_{20}, V_{22}\}$ are the SuperHyperOffensive type-SuperHyperSets of the SuperHyperAlliances.
- $S = \{V_{12}, V_{13}, V_{14}, V_1, V_{10}, V_{11}, V_6, V_7\}$ is the SuperHyperOffensive type-SuperHyperSets of the SuperHyperAlliances.
- $S = \{V_{12}, V_{13}, V_{14}, V_1, V_{10}, V_{11}, V_6, V_7\}$ is the SuperHyperOffensive type-SuperHyperSets of the SuperHyperAlliances.
- $S = \{V_1, V_2, V_3, V_4, V_5, V_6, V_7, V_8, V_9, V_{10}, V_{21}\}$ and $S' = \{V_{11}, V_{12}, V_{13}, V_{14}, V_{15}, V_{16}, V_{17}, V_{18}, V_{19}, V_{20}, V_{22}\}$ are the SuperHyperOffensive type-SuperHyperSets of the SuperHyperAlliances.
- $S = \{V_{12}, V_{13}, V_{14}, V_1, V_{10}, V_{11}, V_6, V_7\}$ is the SuperHyperOffensive type-SuperHyperSets of the SuperHyperAlliances.
- $S = \{V_1, V_2, V_3\}$ and $S' = \{V_4, V_5, V_6\}$ are the SuperHyperOffensive type-SuperHyperSets of the SuperHyperAlliances.
- $S = \{V_1, V_2, V_3, V_7\}$ is the SuperHyperOffensive type-SuperHyperSets of the SuperHyperAlliances.
- $S = \{V_1, V_2, V_3\}$ is the SuperHyperOffensive type-SuperHyperSets of the SuperHyperAlliances.
- $S = \{V_1, V_2, V_3\}$ is the SuperHyperOffensive type-SuperHyperSets of the SuperHyperAlliances.
- $S = \{V_1, V_2, V_3, V_4, V_5, V_6\}$ is the SuperHyperOffensive type-SuperHyperSets of the SuperHyperAlliances.
- $S = \{V_1, V_{24}V_{29}V_{25}V_{23}, V_2, V_6, V_3, V_4, V_9, V_{14}, V_{16}, V_{15}, V_{12}, V_{13}, V_{17}, V_{18}\}$ is the SuperHyperOffensive type-SuperHyperSets of the SuperHyperAlliances.
- $S = \{V_2, V_6, V_3, V_4, V_9, V_{14}, V_{16}, V_{15}, V_{12}, V_{13}, V_{17}, V_{18}\}$ is the SuperHyperOffensive type-SuperHyperSets of the SuperHyperAlliances.
- $S = \{V_2, R, M_6, L_6, F, P\}$ is the SuperHyperOffensive type-SuperHyperSets of the SuperHyperAlliances.
- $$S = \{V_{11}, Z_5, W_5, C_6, U_5, L_5, V_2, R_9, H_7, V_5, U_6, V_4, V_6, V_7, V_8, Z_8, V_8, W_8, C_9, S_9, K_9, O_4, V_{10}, P_4, R_4, T_4, S_4\}$$
  is the SuperHyperOffensive type-SuperHyperSets of the SuperHyperAlliances.

4 Neutrosophic SuperHyperAlliances

For the sake of having neutrosophic SuperHyperAlliances, there's a need to "**redefine**" the notion of "neutrosophic SuperHyperGraph". The SuperHyperVertices and the SuperHyperEdges are assigned by the labels from the letters of the alphabets. In this procedure, there's the usage of the position of labels to assign to the values.

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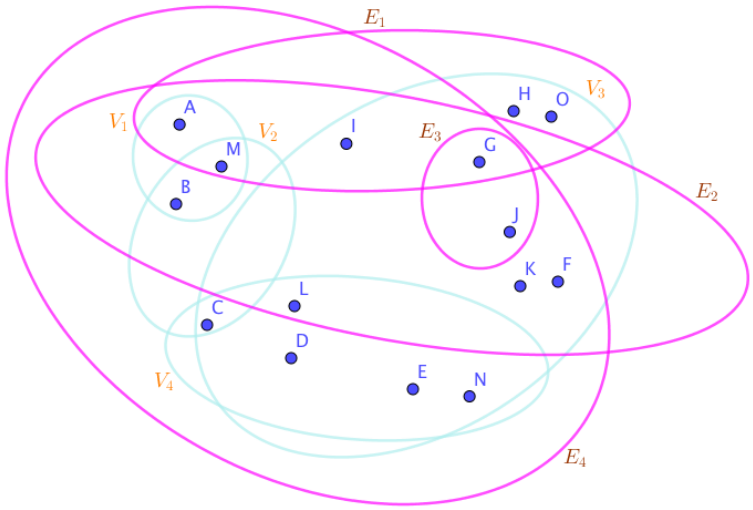

Figure 1. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

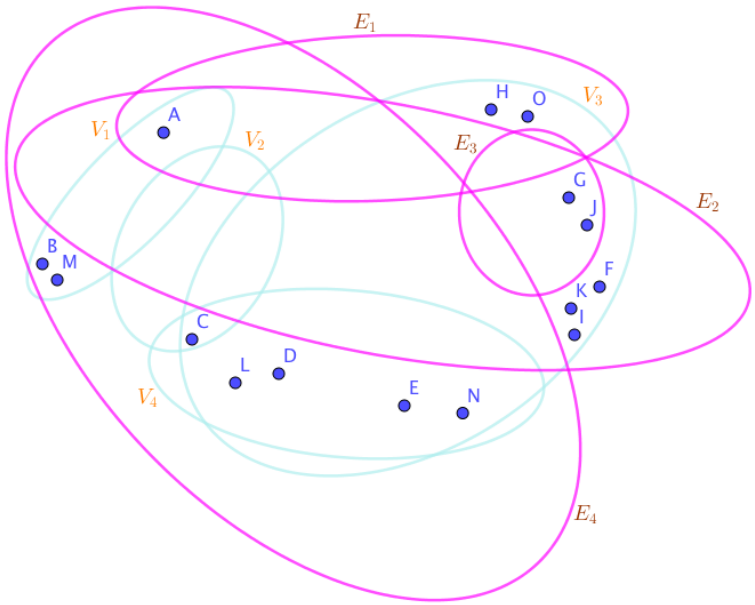

Figure 2. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

Table 1. The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperGraph Mentioned in the Definition (4.3)

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The Minimum Values of Its Vertices
The Values of The Edges	The Minimum Values of Its Vertices
The Values of The HyperEdges	The Minimum Values of Its Vertices
The Values of The SuperHyperEdges	The Minimum Values of Its Endpoints

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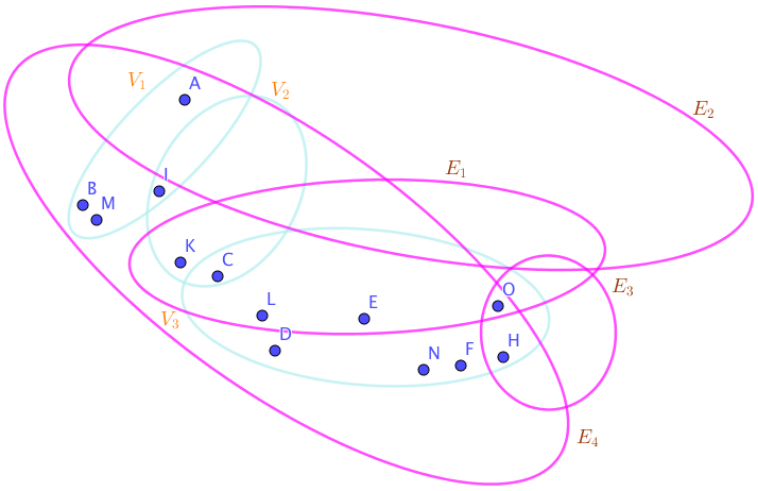

Figure 3. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

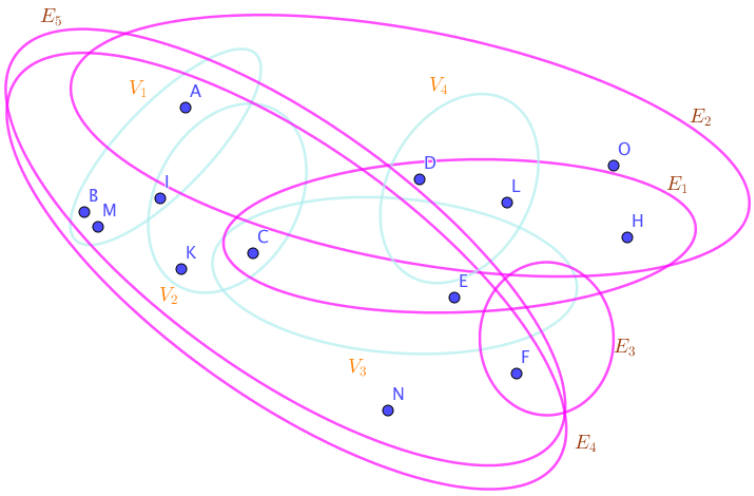

Figure 4. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

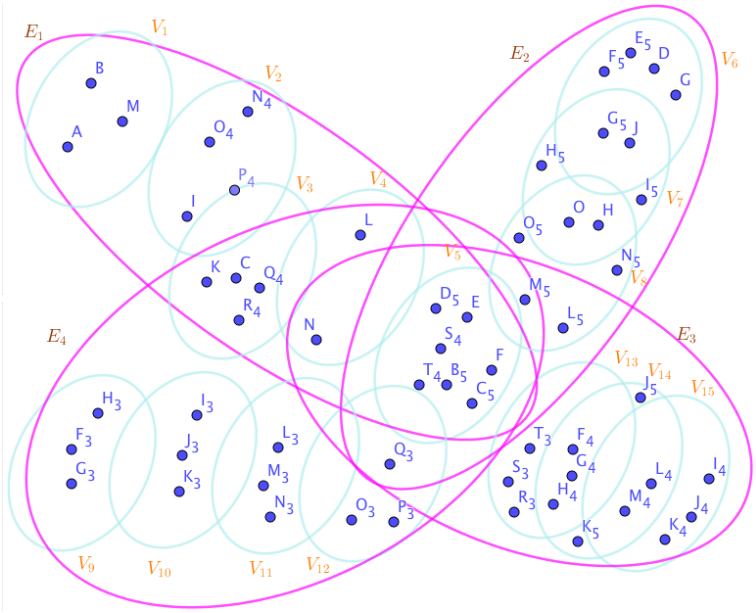

Figure 5. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

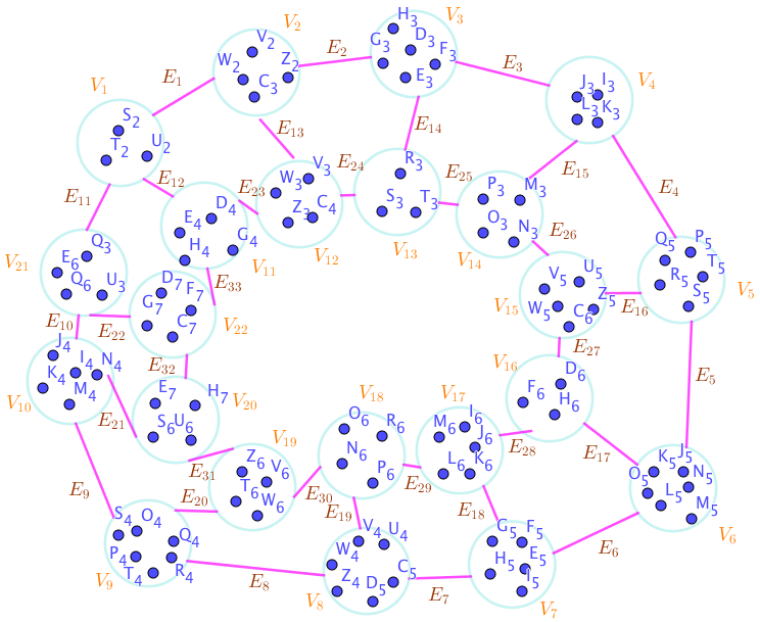

Figure 6. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

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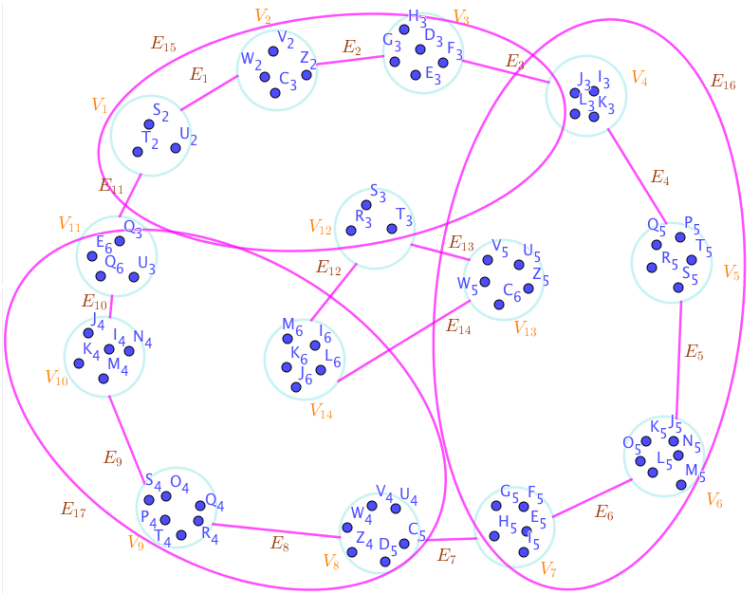

Figure 7. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

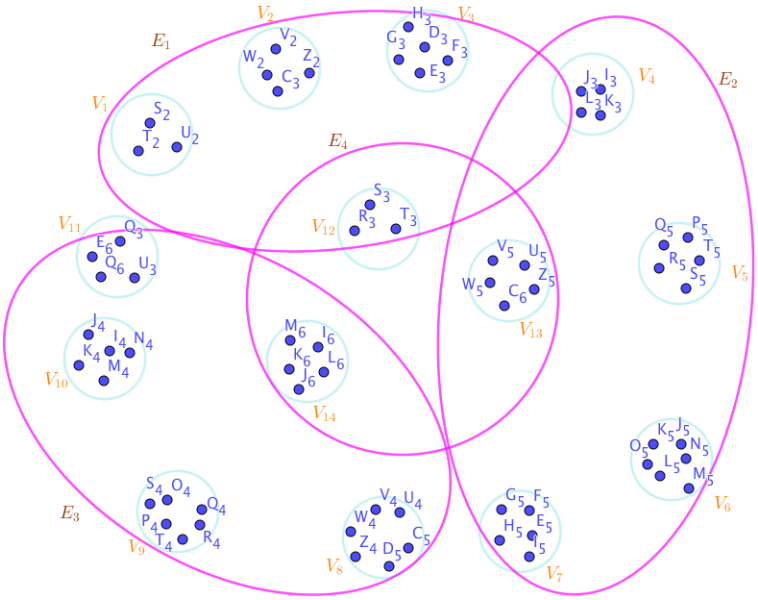

Figure 8. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

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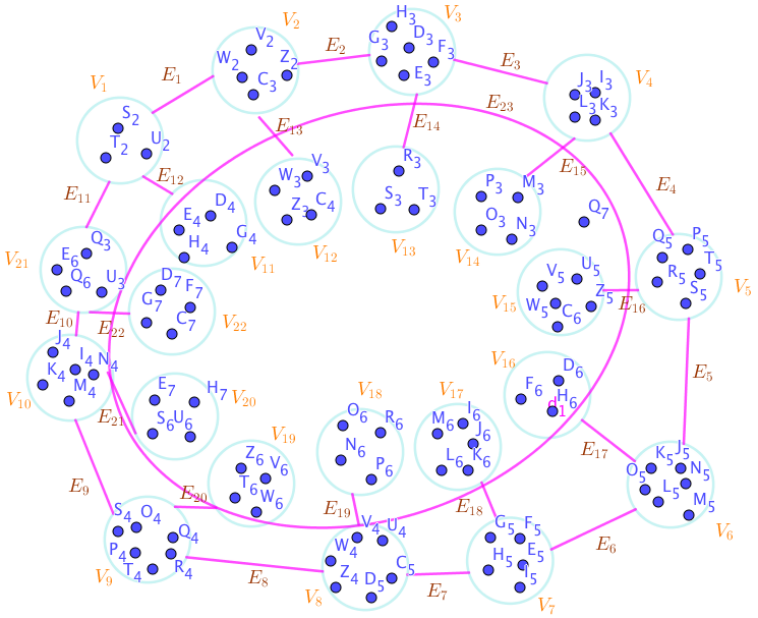

Figure 9. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

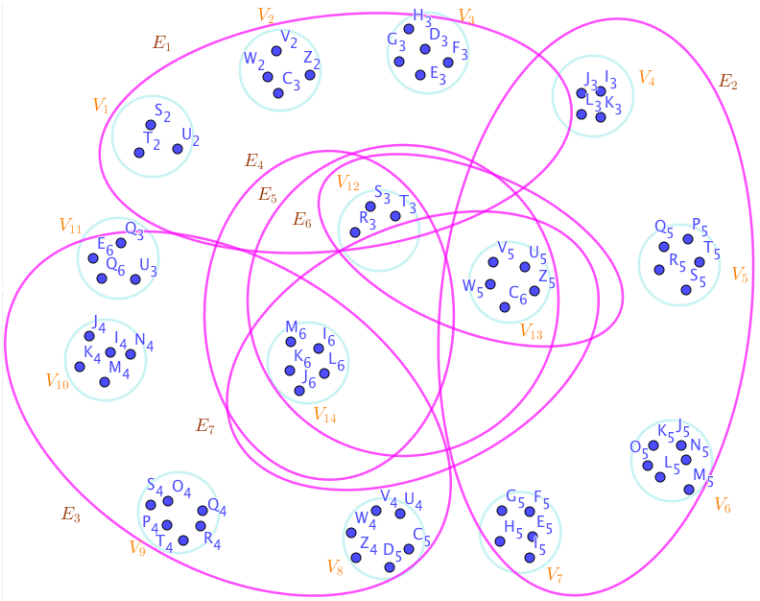

Figure 10. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

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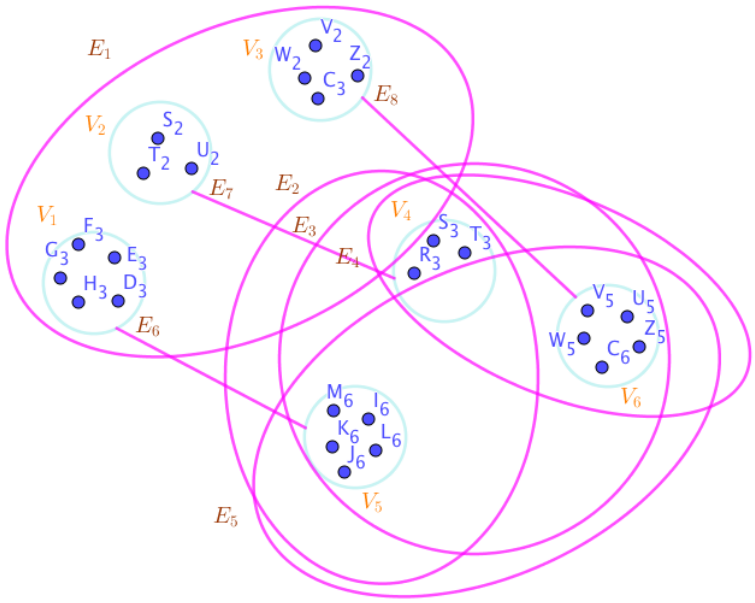

Figure 11. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

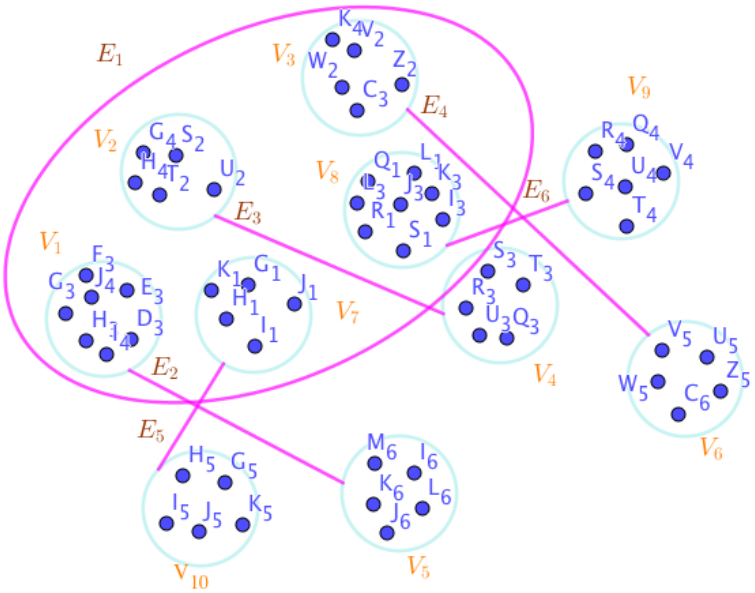

Figure 12. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

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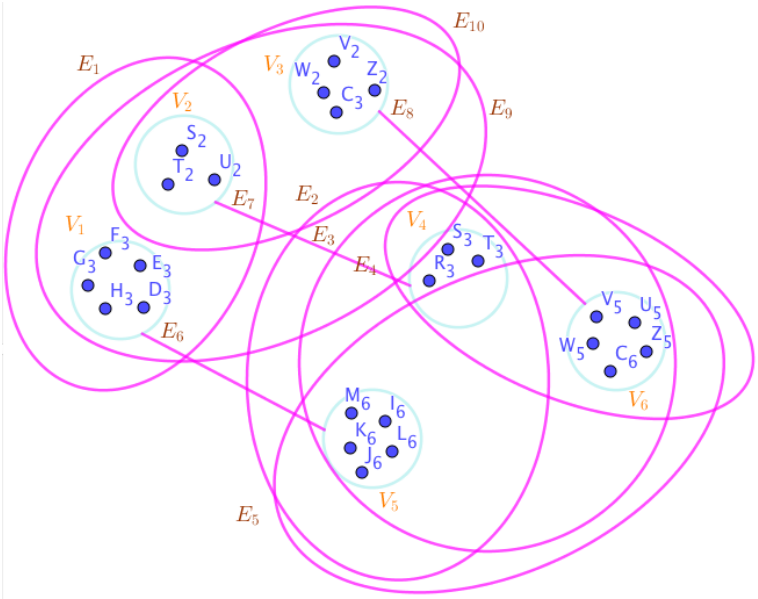

Figure 13. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

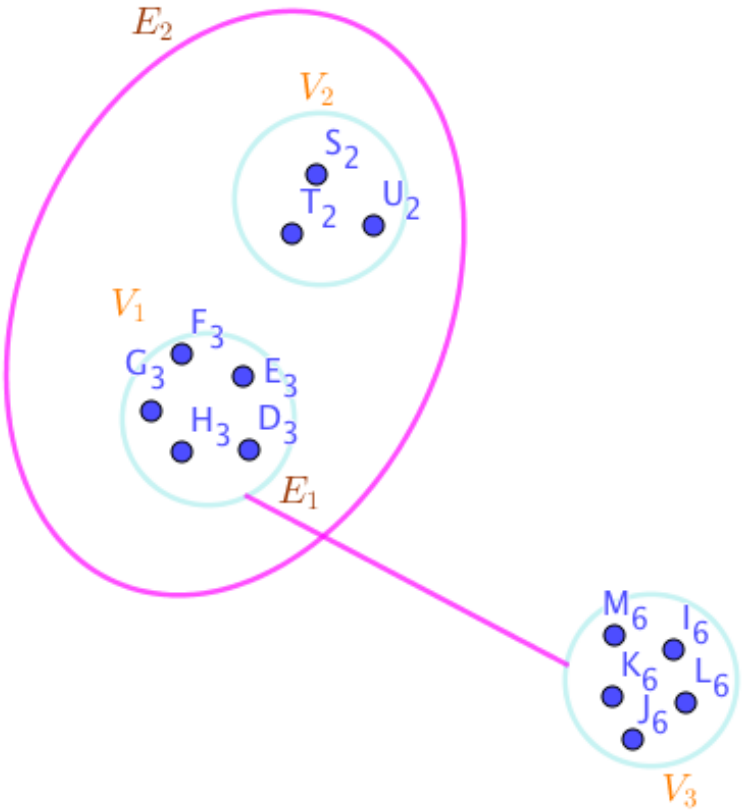

Figure 14. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

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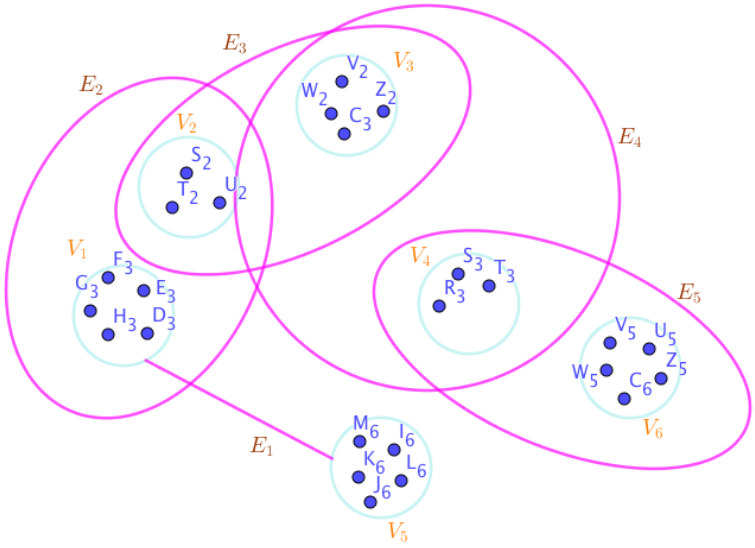

Figure 15. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

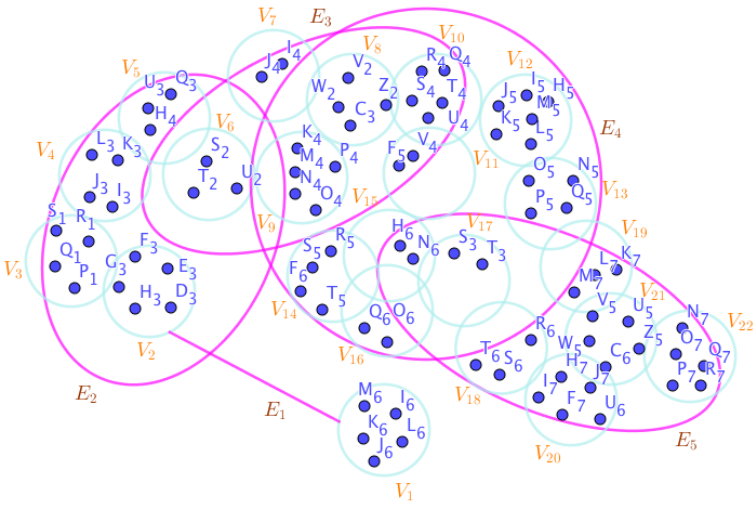

Figure 16. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

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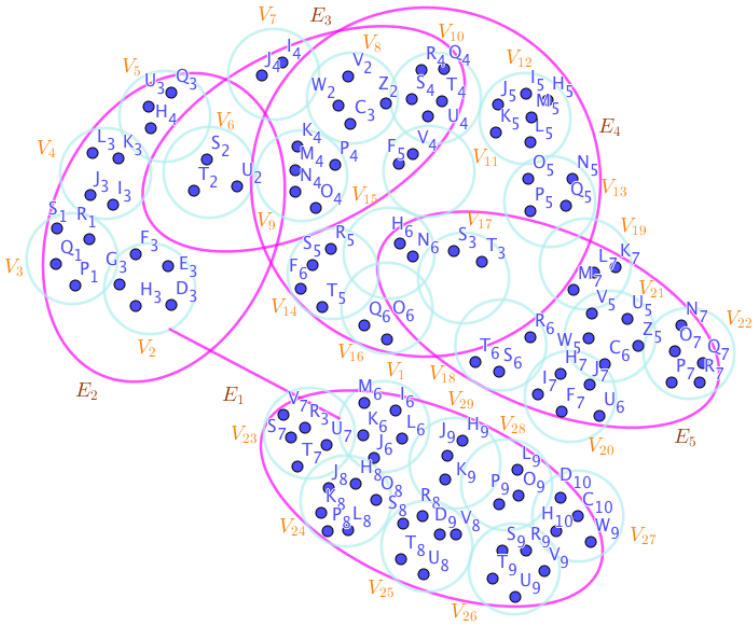

Figure 17. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

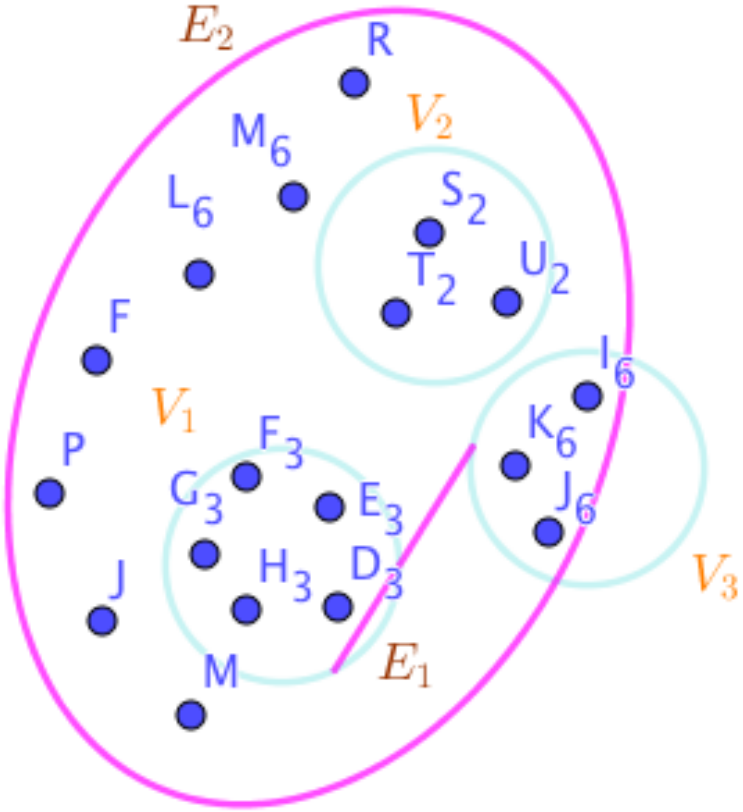

Figure 18. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

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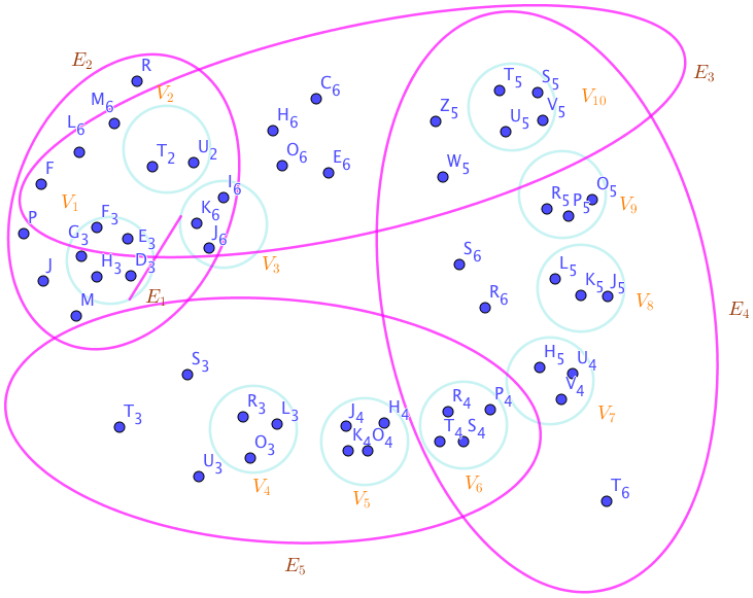

Figure 19. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

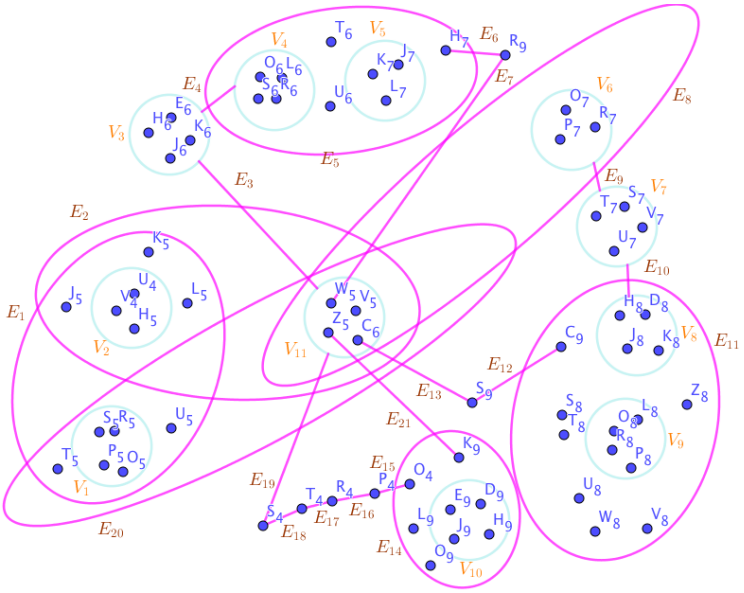

Figure 20. The SuperHyperGraphs Associated to the Notions of SuperHyperAlliances in the Examples (3.6) and (4.4)

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Table 2. The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperGraph, Mentioned in the Definition (4.2)

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The Minimum Values of Its Vertices
The Values of The Edges	The Minimum Values of Its Vertices
The Values of The HyperEdges	The Minimum Values of Its Vertices
The Values of The SuperHyperEdges	The Minimum Values of Its Endpoints

Table 3. The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperGraph Mentioned in the Definition (4.3)

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The Minimum Values of Its Vertices
The Values of The Edges	The Minimum Values of Its Vertices
The Values of The HyperEdges	The Minimum Values of Its Vertices
The Values of The SuperHyperEdges	The Minimum Values of Its Endpoints

Definition 4.1. Assume a neutrosophic SuperHyperGraph. It's redefined **neutrosophic SuperHyperGraph** if the Table (1) holds.

It's useful to define "neutrosophic" version of SuperHyperClasses. Since there's more ways to get neutrosophic type-results to make neutrosophic SuperHyperAlliances more understandable.

Definition 4.2. Assume a neutrosophic SuperHyperGraph. There are some **neutrosophic SuperHyperClasses** if the Table (2) holds. Thus SuperHyperPath, SuperHyperCycle, SuperHyperStar, SuperHyperBipartite, SuperHyperMultiPartite, and SuperHyperWheel, are **neutrosophic SuperHyperPath**, **neutrosophic SuperHyperCycle**, **neutrosophic SuperHyperStar**, **neutrosophic SuperHyperBipartite**, **neutrosophic SuperHyperMultiPartite**, and **neutrosophic SuperHyperWheel** if the Table (2) holds.

It's useful to define "neutrosophic" version of SuperHyperAlliances. Since there's more ways to get type-results to make SuperHyperAlliances more understandable.

For the sake of having neutrosophic SuperHyperAlliances, there's a need to "**redefine**" the notion of "SuperHyperAlliances". The SuperHyperVertices and the SuperHyperEdges are assigned by the labels from the letters of the alphabets. In this procedure, there's the usage of the position of labels to assign to the values.

Definition 4.3. Assume a SuperHyperAlliance. It's redefined **neutrosophic SuperHyperAlliance** if the Table (3) holds.

Example 4.4. Assume the neutrosophic SuperHyperGraphs in the Figures (1), (2), (3), (4), (5), (6), (7), (8), (9), (10), (11), (12), (13), (14), (15), (16), (17), (18), (19), and (20).

- $S = \{A, B, C, D, E, F, G, H\}$ is the neutrosophic SuperHyperOffensive type-SuperHyperSet of the neutrosophic SuperHyperAlliance.
- $S = \{A, B, C, D, E, F, G, H\}$ is the neutrosophic SuperHyperOffensive type-SuperHyperSet of the neutrosophic SuperHyperAlliance.
- $S = \{A, B, C, D, E, F, H, I\}$ is the neutrosophic SuperHyperOffensive type-SuperHyperSet of the neutrosophic SuperHyperAlliance.

- $S = \{A, B, C, D, E, F, H, I\}$ is the neutrosophic SuperHyperOffensive type-SuperHyperSet of the neutrosophic SuperHyperAlliance.
- $S = \{V_1, V_2, V_3, V_4, V_5, V_6, V_7, V_8\}$ is the neutrosophic SuperHyperOffensive type-SuperHyperSet of the neutrosophic SuperHyperAlliance.
- $S = \{V_1, V_2, V_3, V_4, V_5, V_6, V_7, V_8, V_9, V_{10}, V_{21}\}$ and $S' = \{V_{11}, V_{12}, V_{13}, V_{14}, V_{15}, V_{16}, V_{17}, V_{18}, V_{19}, V_{20}, V_{22}\}$ are the neutrosophic SuperHyperOffensive type-SuperHyperSets of the neutrosophic SuperHyperAlliances.
- $S = \{V_{12}, V_{13}, V_{14}, V_1, V_{10}, V_{11}, V_6, V_7\}$ is the neutrosophic SuperHyperOffensive type-SuperHyperSets of the neutrosophic SuperHyperAlliances.
- $S = \{V_{12}, V_{13}, V_{14}, V_1, V_{10}, V_{11}, V_6, V_7\}$ is the neutrosophic SuperHyperOffensive type-SuperHyperSets of the neutrosophic SuperHyperAlliances.
- $S = \{V_1, V_2, V_3, V_4, V_5, V_6, V_7, V_8, V_9, V_{10}, V_{21}\}$ and $S' = \{V_{11}, V_{12}, V_{13}, V_{14}, V_{15}, V_{16}, V_{17}, V_{18}, V_{19}, V_{20}, V_{22}\}$ are the neutrosophic SuperHyperOffensive type-SuperHyperSets of the neutrosophic SuperHyperAlliances.
- $S = \{V_{12}, V_{13}, V_{14}, V_1, V_{10}, V_{11}, V_6, V_7\}$ is the neutrosophic SuperHyperOffensive type-SuperHyperSets of the neutrosophic SuperHyperAlliances.
- $S = \{V_1, V_2, V_3\}$ and $S' = \{V_4, V_5, V_6\}$ are the neutrosophic SuperHyperOffensive type-SuperHyperSets of the neutrosophic SuperHyperAlliances.
- $S = \{V_1, V_2, V_3, V_7\}$ is the neutrosophic SuperHyperOffensive type-SuperHyperSets of the neutrosophic SuperHyperAlliances.
- $S = \{V_1, V_2, V_3\}$ is the neutrosophic SuperHyperOffensive type-SuperHyperSets of the neutrosophic SuperHyperAlliances.
- $S = \{V_1, V_2, V_3\}$ is the neutrosophic SuperHyperOffensive type-SuperHyperSets of the neutrosophic SuperHyperAlliances.
- $S = \{V_1, V_2, V_3, V_4, V_5, V_6\}$ is the neutrosophic SuperHyperOffensive type-SuperHyperSets of the neutrosophic SuperHyperAlliances.
- $S = \{V_1, V_{24}V_{29}V_{25}V_{23}, V_2, V_6, V_3, V_4, V_9, V_{14}, V_{16}, V_{15}, V_{12}, V_{13}, V_{17}, V_{18}\}$ is the neutrosophic SuperHyperOffensive type-SuperHyperSets of the neutrosophic SuperHyperAlliances.
- $S = \{V_2, V_6, V_3, V_4, V_9, V_{14}, V_{16}, V_{15}, V_{12}, V_{13}, V_{17}, V_{18}\}$ is the neutrosophic SuperHyperOffensive type-SuperHyperSets of the neutrosophic SuperHyperAlliances.
- $S = \{V_2, R, M_6, L_6, F, P\}$ is the neutrosophic SuperHyperOffensive type-SuperHyperSets of the neutrosophic SuperHyperAlliances.
- $$S = \{V_{11}, Z_5, W_5, C_6, U_5, L_5, V_2, R_9, H_7, V_5, U_6, V_4, V_6, V_7, V_8, Z_8, V_8, W_8, C_9, S_9, K_9, O_4, V_{10}, P_4, R_4, T_4, S_4\}$$ is the neutrosophic SuperHyperOffensive type-SuperHyperSets of the neutrosophic SuperHyperAlliances.

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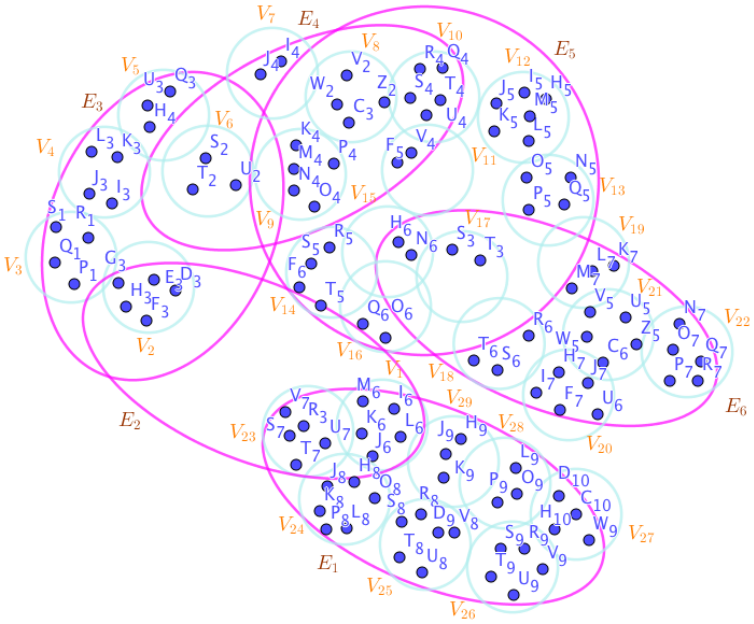

Figure 21. A SuperHyperPath Associated to the Notions of SuperHyperAlliances in the Example (5.2)

5 Results on SuperHyperClasses

Proposition 5.1. *Assume a SuperHyperPath. Then SuperHyperAlliances are the set of the exterior SuperHyperVertices plus the half of their individual SuperHyperNeighbors plus one.*

Example 5.2. In the Figure (21), the SuperHyperPath is highlighted and featured.

Proposition 5.3. *Assume a SuperHyperCycle. Then SuperHyperAlliances are the set of the exterior SuperHyperVertices plus the half of their individual SuperHyperNeighbors plus one.*

Example 5.4. In the Figure (22), the SuperHyperCycle is highlighted and featured.

Proposition 5.5. *Assume a SuperHyperStar. Then SuperHyperAlliances are the set of the SuperHyperCenters plus the half of their individual SuperHyperNeighbors plus one.*

Example 5.6. In the Figure (23), the SuperHyperStar is highlighted and featured.

Proposition 5.7. *Assume a SuperHyperBipartite. Then SuperHyperAlliances are the set of the SuperHyperVertices from the biggest SuperHyperPart plus the half of their individual SuperHyperNeighbors plus one.*

Example 5.8. In the Figure (24), the SuperHyperBipartite is highlighted and featured.

Proposition 5.9. *Assume a SuperHyperMultipartite. Then SuperHyperAlliances are the set of the SuperHyperVertices from the biggest SuperHyperPart plus the half of their individual SuperHyperNeighbors plus one.*

Example 5.10. In the Figure (25), the SuperHyperMultipartite is highlighted and featured.

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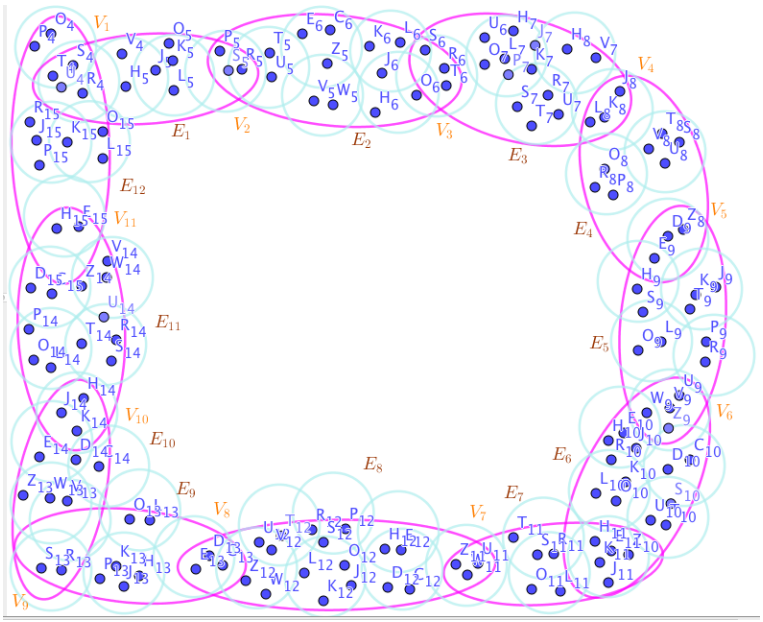

Figure 22. A SuperHyperCycle Associated to the Notions of SuperHyperAlliances in the Example (5.4)

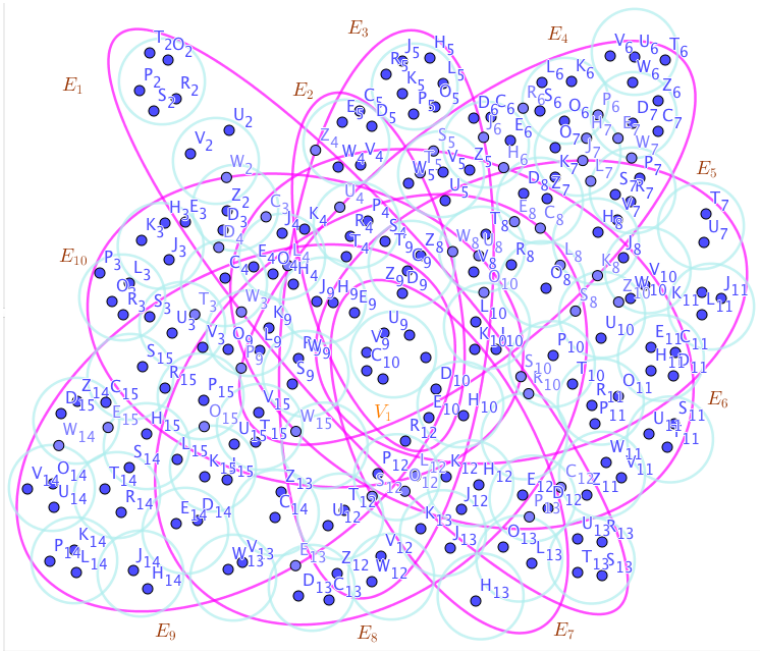

Figure 23. A SuperHyperStar Associated to the Notions of SuperHyperAlliances in the Example (5.6)

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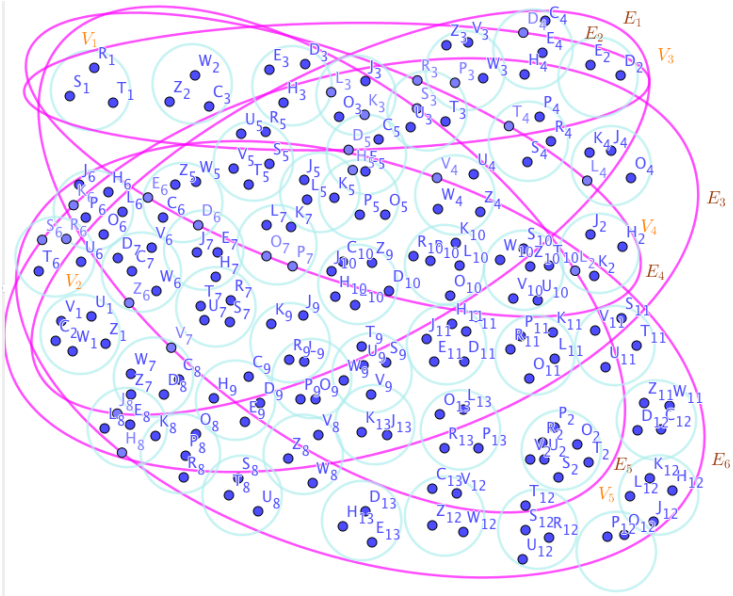

Figure 24. A SuperHyperBipartite Associated to the Notions of SuperHyperAlliances in the Example (5.8)

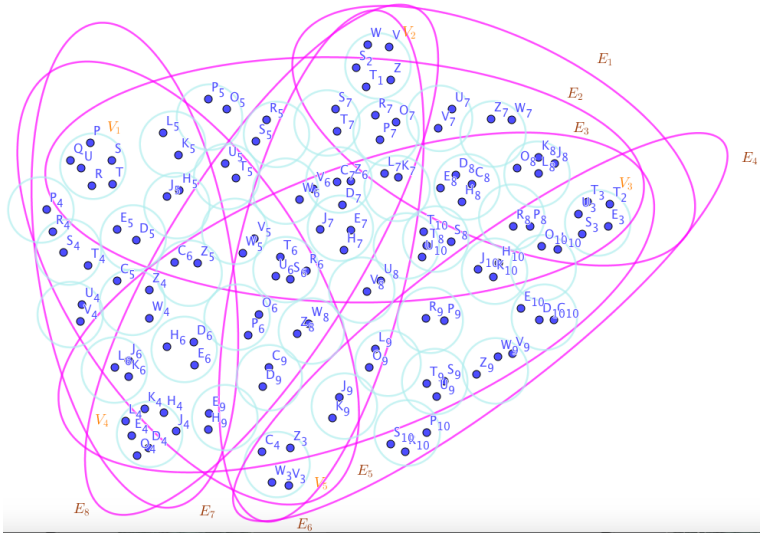

Figure 25. A SuperHyperMultipartite Associated to the Notions of SuperHyperAlliances in the Example (5.10)

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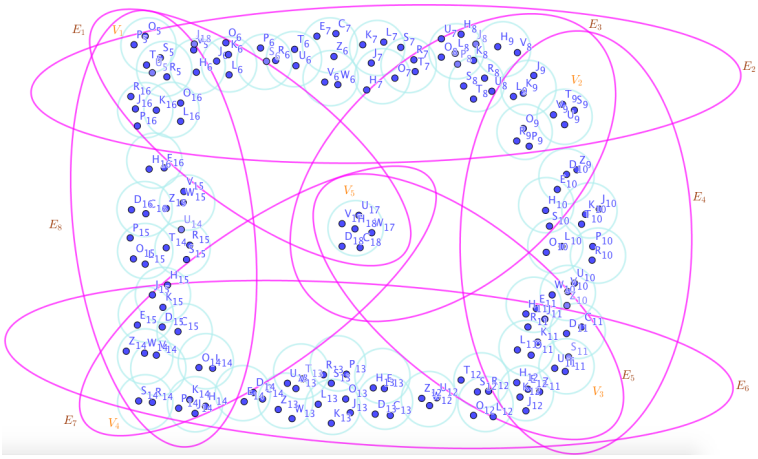

Figure 26. A SuperHyperWheel Associated to the Notions of SuperHyperAlliances in the Example (5.12)

Table 4. The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperPath Mentioned in the Example (6.2)

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The Minimum Values of Its Vertices
The Values of The Edges	The Minimum Values of Its Vertices
The Values of The HyperEdges	The Minimum Values of Its Vertices
The Values of The SuperHyperEdges	The Minimum Values of Its Endpoints

Proposition 5.11. *Assume a SuperHyperWheel. Then SuperHyperAlliances are the SuperHyperCenters plus the half of their individual SuperHyperNeighbors [the set of the exterior SuperHyperVertices plus the half of their individual SuperHyperNeighbors plus one] plus one.*

Example 5.12. In the Figure (26), the SuperHyperWheel is highlighted and featured.

6 Results on Neutrosophic SuperHyperClasses

Proposition 6.1. *Assume a neutrosophic SuperHyperPath. Then neutrosophic SuperHyperAlliances are the SuperHyperSets of the exterior SuperHyperVertices plus the half of their individual SuperHyperNeighbors plus one with the maximal neutrosophic cardinality amid those SuperHyperSets.*

Example 6.2. In the Figure (27), the SuperHyperPath is highlighted and featured. By using the Figure (27) and the Table (4), the neutrosophic SuperHyperPath is obtained.

Proposition 6.3. *Assume a neutrosophic SuperHyperCycle. Then*

$$\begin{aligned} Neutrosophic\ SuperHyperAlliances = \{&theSuperHyperSetsofthe \\ &SuperHyperVertices \mid \max|theSuperHyperSetsof \\ &theexteriorSuperHyper \\ &Verticesplusthehalfoftheir \\ &individualSuperHyperNeighbors \\ &plusone|_{neutrosophiccardinalityamidthoseSuperHyperSets.}\} \end{aligned}$$

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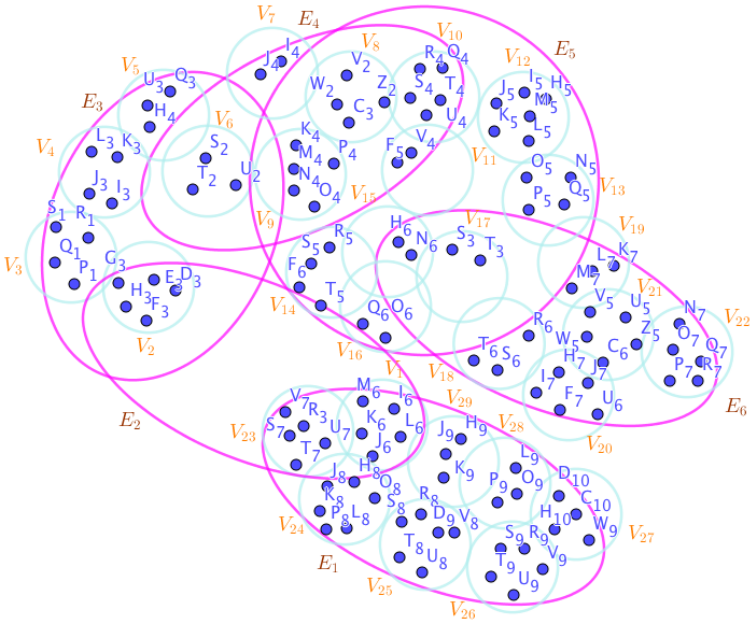

Figure 27. A Neutrosophic SuperHyperPath Associated to the Notions of SuperHyperAlliances in the Example (6.2)

Table 5. The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperCycle Mentioned in the Example (6.4)

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The Minimum Values of Its Vertices
The Values of The Edges	The Minimum Values of Its Vertices
The Values of The HyperEdges	The Minimum Values of Its Vertices
The Values of The SuperHyperEdges	The Minimum Values of Its Endpoints

Where σ_i is the unary operation on the SuperHyperVertices of the SuperHyperGraph to assign the determinacy, the indeterminacy and the neutrality, for $i = 1, 2, 3$, respectively.

Example 6.4. In the Figure (28), the SuperHyperCycle is highlighted and featured. By using the Figure (28) and the Table (5), the neutrosophic SuperHyperCycle is obtained.

Proposition 6.5. *Assume a neutrosophic SuperHyperStar. Then neutrosophic SuperHyperAlliances are the SuperHyperSets of the SuperHyperCenters plus the half of their individual SuperHyperNeighbors plus one with the maximal neutrosophic cardinality amid those SuperHyperSets.*

Example 6.6. In the Figure (29), the SuperHyperStar is highlighted and featured. By using the Figure (29) and the Table (6), the neutrosophic SuperHyperStar is obtained.

Proposition 6.7. *Assume a neutrosophic SuperHyperBipartite. Then neutrosophic*

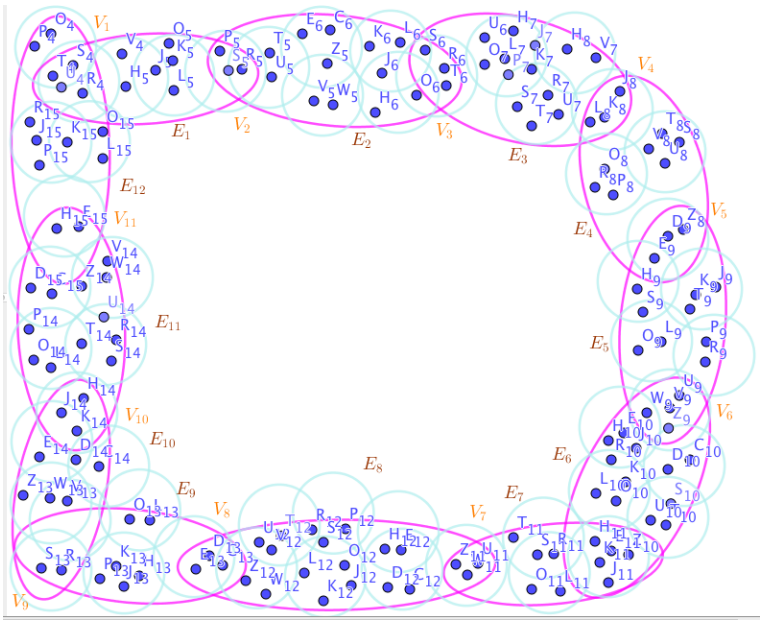

Figure 28. A Neutrosophic SuperHyperCycle Associated to the Notions of SuperHyperAlliances in the Example (6.4)

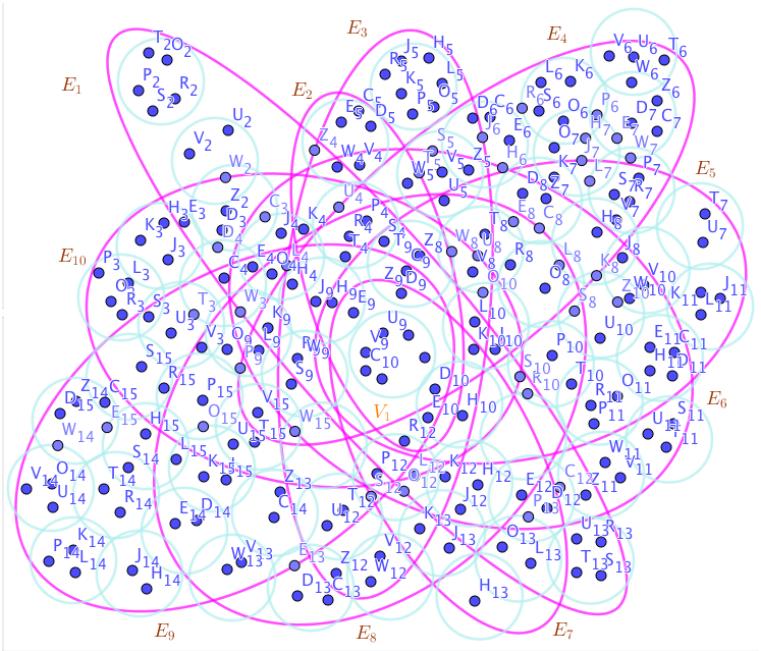

Figure 29. A Neutrosophic SuperHyperStar Associated to the Notions of SuperHyperAlliances in the Example (6.6)

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Table 6. The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperStar Mentioned in the Example (6.6)

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The Minimum Values of Its Vertices
The Values of The Edges	The Minimum Values of Its Vertices
The Values of The HyperEdges	The Minimum Values of Its Vertices
The Values of The SuperHyperEdges	The Minimum Values of Its Endpoints

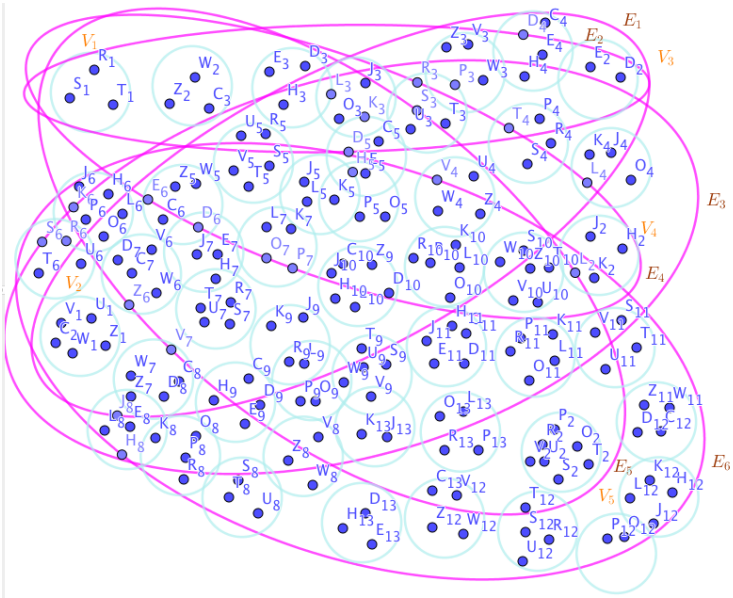

Figure 30. A Neutrosophic SuperHyperBipartite Associated to the Notions of SuperHyperAlliances in the Example (6.8)

SuperHyperAlliances are

$$\begin{aligned} &Neutrosophic\ SuperHyperAlliances = \{the \\ &SuperHyperSetsoftheSuperHyperVertices \mid \max|theSuperHyperSetsof \\ &theSuperHyperVerticesfrom \\ &thebiggestSuperHyperPart \\ &plusthehalfoftheirindividual \\ &SuperHyperNeighbors \\ &plusone|_{neutrosophiccardinalityamidthoseSuperHyperSets.}\} \end{aligned}$$

Where σ_i is the unary operation on the SuperHyperVertices of the SuperHyperGraph to assign the determinacy, the indeterminacy and the neutrality, for $i = 1, 2, 3$, respectively.

Example 6.8. In Figure (30), the SuperHyperBipartite is highlighted and featured. By using the Figure (30) and the Table (7), the neutrosophic SuperHyperBipartite is obtained.

Proposition 6.9. *Assume a neutrosophic SuperHyperMultipartite. Then neutrosophic*

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Table 7. The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperBipartite Mentioned in the Example (6.8)

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The Minimum Values of Its Vertices
The Values of The Edges	The Minimum Values of Its Vertices
The Values of The HyperEdges	The Minimum Values of Its Vertices
The Values of The SuperHyperEdges	The Minimum Values of Its Endpoints

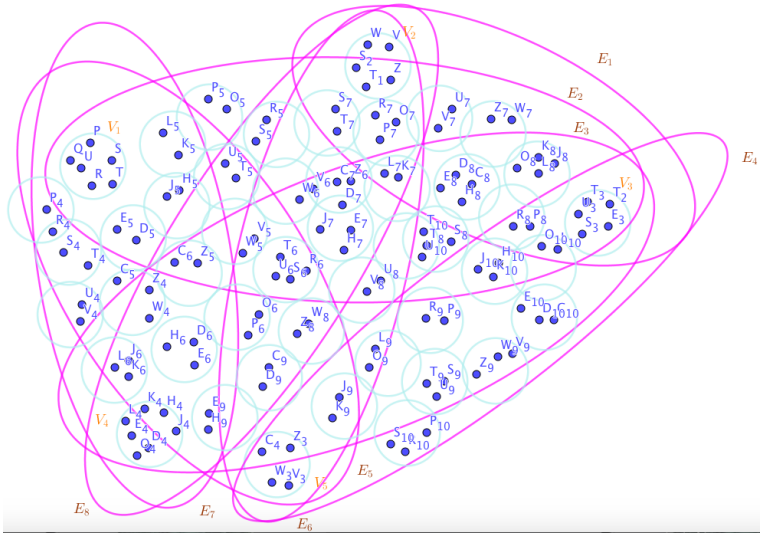

Figure 31. A Neutrosophic SuperHyperMultipartite Associated to the Notions of SuperHyperAlliances in the Example (6.10)

SuperHyperAlliances are

$$\begin{aligned} Neutrosophic\ SuperHyperAlliances = \{the\ SuperHyperSets of the SuperHyperVertices \mid \max|the SuperHyperSets of \\ the SuperHyperVertices from \\ the biggest SuperHyperPart \\ plus the half of their individual \\ SuperHyperNeighbors \\ plus one|_{neutrosophic cardinality amid those SuperHyperSets.}\} \end{aligned}$$

Where σ_i is the unary operation on the SuperHyperVertices of the SuperHyperGraph to assign the determinacy, the indeterminacy and the neutrality, for $i = 1, 2, 3$, respectively.

Example 6.10. In Figure (31), the SuperHyperMultipartite is highlighted and featured. By using the Figure (31) and the Table (8), the neutrosophic SuperHyperMultipartite is obtained.

Proposition 6.11. *Assume a neutrosophic SuperHyperWheel. Then neutrosophic*

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Table 8. The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperMultipartite Mentioned in the Example (6.10)

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The Minimum Values of Its Vertices
The Values of The Edges	The Minimum Values of Its Vertices
The Values of The HyperEdges	The Minimum Values of Its Vertices
The Values of The SuperHyperEdges	The Minimum Values of Its Endpoints

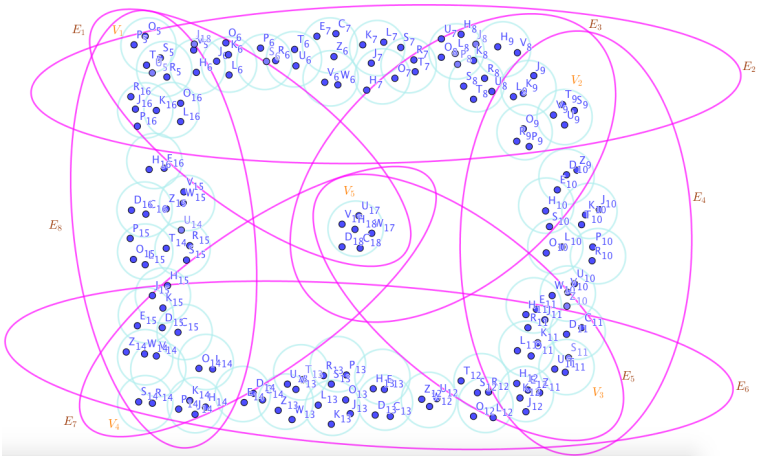

Figure 32. A Neutrosophic SuperHyperWheel Associated to the Notions of SuperHyperAlliances in the Example (6.12)

SuperHyperAlliances are

$$\begin{aligned} &Neutrosophic\ SuperHyperAlliances = \{the \\ &SuperHyperSetsoftheSuperHyperVertices \mid \max|theSuperHyperCenters \\ &plusthehalfoftheirindividual \\ &SuperHyperNeighbors \\ &*theSuperHyperSetsofthe \\ &exteriorSuperHyperVertices \\ &plusthehalfoftheir \\ &individualSuperHyperNeighborsplusone* \\ &plusone|_{neutrosophiccardinalityamidthoseSuperHyperSets.}\} \end{aligned}$$

Where σ_i is the unary operation on the SuperHyperVertices of the SuperHyperGraph to assign the determinacy, the indeterminacy and the neutrality, for $i = 1, 2, 3$, respectively.

Example 6.12. In the Figure (32), the SuperHyperWheel is highlighted and featured. By using the Figure (32) and the Table (9), the neutrosophic SuperHyperWheel is obtained.

7 General Results

For the SuperHyperAlliances, and the neutrosophic SuperHyperAlliances, some general results are introduced.

Remark 7.1. Let remind that the neutrosophic SuperHyperAlliances is "redefined" on the positions of the alphabets.

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Table 9. The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperWheel Mentioned in the Example (6.12)

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The Minimum Values of Its Vertices
The Values of The Edges	The Minimum Values of Its Vertices
The Values of The HyperEdges	The Minimum Values of Its Vertices
The Values of The SuperHyperEdges	The Minimum Values of Its Endpoints

Corollary 7.2. *Assume SuperHyperAlliances. Then*

$$\begin{aligned}&Neutrosophic\ SuperHyperAlliances = \\ &\{theSuperHyperAlliancesoftheSuperHyperVertices \mid \\ &\max|SuperHyperAlliances|_{neutrosophiccardinalityamidthoseSuperHyperAlliances.}\}\end{aligned}$$

Where σ_i is the unary operation on the SuperHyperVertices of the SuperHyperGraph to assign the determinacy, the indeterminacy and the neutrality, for $i = 1, 2, 3$, respectively.

Corollary 7.3. *Assume a neutrosophic SuperHyperGraph on the same identical letter of the alphabet. Then the notion of neutrosophic SuperHyperAlliances and SuperHyperAlliances coincide.*

Corollary 7.4. *Assume a neutrosophic SuperHyperGraph on the same identical letter of the alphabet. Then a consecutive sequence of the SuperHyperVertices is a neutrosophic SuperHyperAlliances if and only if it's a SuperHyperAlliances.*

Corollary 7.5. *Assume a neutrosophic SuperHyperGraph on the same identical letter of the alphabet. Then a consecutive sequence of the SuperHyperVertices is a strongest SuperHyperCycle if and only if it's a longest SuperHyperCycle.*

Corollary 7.6. *Assume SuperHyperClasses of a neutrosophic SuperHyperGraph on the same identical letter of the alphabet. Then its neutrosophic SuperHyperAlliances is its SuperHyperAlliances and reversely.*

Corollary 7.7. *Assume a neutrosophic SuperHyperPath(-/SuperHyperCycle, SuperHyperStar, SuperHyperBipartite, SuperHyperMultipartite, SuperHyperWheel) on the same identical letter of the alphabet. Then its neutrosophic SuperHyperAlliances is its SuperHyperAlliances and reversely.*

Corollary 7.8. *Assume a neutrosophic SuperHyperGraph. Then its neutrosophic SuperHyperAlliances isn't well-defined if and only if its SuperHyperAlliances isn't well-defined.*

Corollary 7.9. *Assume SuperHyperClasses of a neutrosophic SuperHyperGraph. Then its neutrosophic SuperHyperAlliances isn't well-defined if and only if its SuperHyperAlliances isn't well-defined.*

Corollary 7.10. *Assume a neutrosophic SuperHyperPath(-/SuperHyperCycle, SuperHyperStar, SuperHyperBipartite, SuperHyperMultipartite, SuperHyperWheel). Then its neutrosophic SuperHyperAlliances isn't well-defined if and only if its SuperHyperAlliances isn't well-defined.*

Corollary 7.11. *Assume a neutrosophic SuperHyperGraph. Then its neutrosophic SuperHyperAlliances is well-defined if and only if its SuperHyperAlliances is well-defined.*

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Table 10. The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperBipartite

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The Minimum Values of Its Vertices
The Values of The Edges	The Minimum Values of Its Vertices
The Values of The HyperEdges	The Minimum Values of Its Vertices
The Values of The SuperHyperEdges	The Minimum Values of Its Endpoints

Corollary 7.12. *Assume SuperHyperClasses of a neutrosophic SuperHyperGraph. Then its neutrosophic SuperHyperAlliances is well-defined if and only if its SuperHyperAlliances is well-defined.*

Corollary 7.13. *Assume a neutrosophic SuperHyperPath(-/SuperHyperCycle, SuperHyperStar, SuperHyperBipartite, SuperHyperMultipartite, SuperHyperWheel). Then its neutrosophic SuperHyperAlliances is well-defined if and only if its SuperHyperAlliances is well-defined.*

8 Applications in Cancer's Recognitions

The cancer is the disease but the model is going to figure out what's going on this phenomenon. The special case of this disease is considered and as the consequences of the model, some parameters are used. The cells are under attack of this disease but the moves of the cancer in the special region are the matter of mind. The recognition of the cancer could help to find some treatments for this disease.

In the following, some steps are devised on this disease.

Step 1. (Definition) The recognition of the cancer in the long-term function.

Step 2. (Issue) The specific region has been assigned by the model [it's called SuperHyperGraph] and the long cycle of the move from the cancer is identified by this research. Sometimes the move of the cancer hasn't be easily identified since there are some determinacy, indeterminacy and neutrality about the moves and the effects of the cancer on that region; this event leads us to choose another model [it's said to be neutrosophic SuperHyperGraph] to have convenient perception on what's happened and what's done.

Step 3. (Model) There are some specific models, which are well-known and they've got the names, and some general models. The moves and the traces of the cancer on the complex tracks and between complicated groups of cells could be fantasized by a neutrosophic SuperHyperPath(-/SuperHyperCycle, SuperHyperStar, SuperHyperBipartite, SuperHyperMultipartite, SuperHyperWheel). The aim is to find either the SuperHyperAlliances or the neutrosophic SuperHyperAlliances in those neutrosophic SuperHyperModels.

8.1 Case 1: The Initial Steps Toward SuperHyperBipartite as SuperHyperModel

Step 4. (Solution) In the Figure (33), the SuperHyperBipartite is highlighted and featured.

By using the Figure (33) and the Table (10), the neutrosophic SuperHyperBipartite is obtained.

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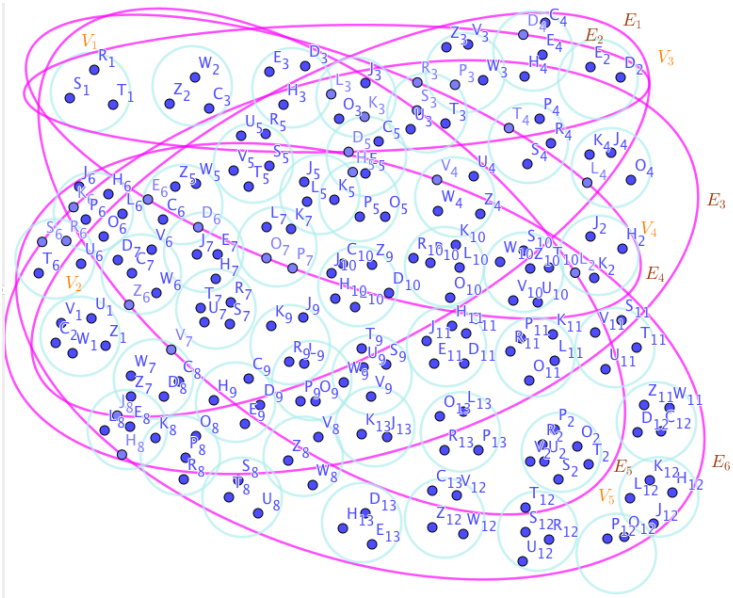

Figure 33. A SuperHyperBipartite Associated to the Notions of SuperHyperAlliances

Table 11. The Values of Vertices, SuperVertices, Edges, HyperEdges, and SuperHyperEdges Belong to The Neutrosophic SuperHyperMultipartite

The Values of The Vertices	The Number of Position in Alphabet
The Values of The SuperVertices	The Minimum Values of Its Vertices
The Values of The Edges	The Minimum Values of Its Vertices
The Values of The HyperEdges	The Minimum Values of Its Vertices
The Values of The SuperHyperEdges	The Minimum Values of Its Endpoints

8.2 Case 2: The Increasing Steps Toward SuperHyperMultipartite as SuperHyperModel

Step 4. (Solution) In the Figure (34), the SuperHyperMultipartite is highlighted and featured.
By using the Figure (34) and the Table (11), the neutrosophic SuperHyperMultipartite is obtained.

9 Open Problems

In what follows, some "problems" and some "questions" are proposed.

The SuperHyperAlliances and the neutrosophic SuperHyperAlliances are defined on a real-world application, titled "Cancer's Recognitions".

Question 9.1. *Which the else SuperHyperModels could be defined based on Cancer's recognitions?*

Question 9.2. *Are there some SuperHyperNotions related to SuperHyperAlliances and the neutrosophic SuperHyperAlliances?*

Question 9.3. *Are there some Algorithms to be defined on the SuperHyperModels to compute them?*

Question 9.4. *Which the SuperHyperNotions are related to beyond the SuperHyperAlliances and the neutrosophic SuperHyperAlliances?*

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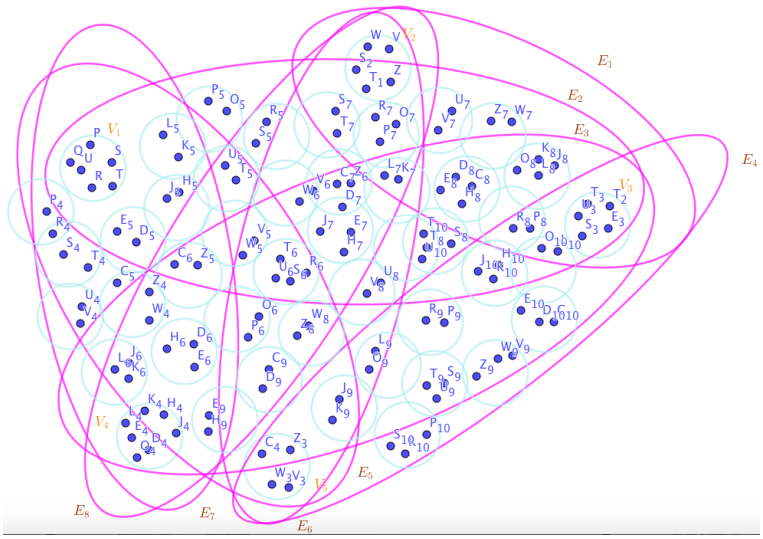

Figure 34. A SuperHyperMultipartite Associated to the Notions of SuperHyperAlliances

Problem 9.5. *The SuperHyperAlliances and the neutrosophic SuperHyperAlliances do a SuperHyperModel for the Cancer's recognitions and they're based on SuperHyperAlliances, are there else?*

Problem 9.6. *Which the fundamental SuperHyperNumbers are related to these SuperHyperNumbers types-results?*

Problem 9.7. *What's the independent research based on Cancer's recognitions concerning the multiple types of SuperHyperNotions?*

10 Conclusion and Closing Remarks

In this section, concluding remarks and closing remarks are represented. The drawbacks of this research are illustrated. Some benefits and some advantages of this research are highlighted.

This research uses some approaches to make neutrosophic SuperHyperGraphs more understandable. In this endeavor, two SuperHyperNotions are defined on the SuperHyperAlliances. For that sake in the second definition, the main definition of the neutrosophic SuperHyperGraph is redefined on the position of the alphabets. Based on the new definition for the neutrosophic SuperHyperGraph, the new SuperHyperNotion, neutrosophic SuperHyperAlliances, finds the convenient background to implement some results based on that. Some SuperHyperClasses and some neutrosophic SuperHyperClasses are the cases of this research on the modeling of the regions where are under the attacks of the cancer to recognize this disease as it's mentioned on the title "Cancer's Recognitions". To formalize the instances on the SuperHyperNotion, SuperHyperAlliances, the new SuperHyperClasses and SuperHyperClasses, are introduced. Some general results are gathered in the section on the SuperHyperAlliances and the neutrosophic SuperHyperAlliances. The clarifications, instances and literature reviews have taken the whole way through. In this research, the literature reviews have fulfilled the lines containing the notions and the results. The SuperHyperGraph and neutrosophic SuperHyperGraph are the SuperHyperModels on the "Cancer's Recognitions" and both bases are the background of this research. Sometimes the cancer has been happened on the region, full of cells, groups of cells and embedded styles. In

this segment, the SuperHyperModel proposes some SuperHyperNotions based on the connectivities of the moves of the cancer in the longest and strongest styles with the formation of the design and the architecture are formally called "SuperHyperAlliances" in the themes of jargons and buzzwords. The prefix "SuperHyper" refers to the theme of the embedded styles to figure out the background for the SuperHyperNotions. In the

Table 12. A Brief Overview about Advantages and Limitations of this Research

Advantages	Limitations
1. Redefining Neutrosophic SuperHyperGraph	1. General Results
2. SuperHyperAlliances	
3. Neutrosophic SuperHyperAlliances	2. Other SuperHyperNumbers
4. Modeling of Cancer's Recognitions	
5. SuperHyperClasses	3. SuperHyperFamilies

Table (12), some limitations and advantages of this research are pointed out.

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