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# MEDIAN OF NEUTROSOPHIC SOFT LATTICES

***GEETHA.P[1] AND DHANALAKSHMI.J[2]**
[1]Assistant Professor, [2]M.Phil Scholar
Department of Mathematics
V.V. Vanniaperumal College for Women, Virudhunagar
Tamil Nadu, INDIA

*Corresponding author: mail: geethannadurai@gmail.com

## ABSTRACT

Neutrosophic set is a part of neutrosophy which was introduced by Smarandche[8] in 1995 as a mathematical tool for dealing problems with indeterminant data. Maji[4] introduced the concept of neutrosophic soft set by combining neutrosophic sets with soft sets. Vakkas Ulucay et al.[9] defined the concept of neutrosophic soft lattices, neutrosophic modular lattices, neutrosophic distributive lattices over the collection of neutrosophic soft sets. In this paper, we define the median of neutrosophic soft lattices and prove some theorems on it with an example.

**Keywords:** Neutrosophic soft sets, neutrosophic soft lattices, neutrosophic soft distributive lattices, neutrosophic soft modular lattices.

**Mathematics Subject Classification**: 03B99 ,03E99

## 1. INTRODUCTION

Neutrosophic set is a part of neutrosophy introduced by Smarandache[8] in 1995 as a mathematical tool for dealing problems with indeterminant data. Maji[4] combined the neutrosophic set with soft sets and introduced a new mathematical model neutrosophic soft set. Vakkas Ulucay et al.[9] defined the concept of neutrosophic soft lattices by applying the notion of neutrosophic soft set theory to lattice theory and derived some properties of neutrosophic soft lattices over the collection of neutrosophic soft sets using the operations of neutrosophic soft sets. In this paper, we define the median of neutrosophic soft lattices and prove some theorems on it with an example.

## 2. Preliminaries

**Definition 2.1**. [3] A pair (F, A) is called a soft set over U, Where F is a mapping given by $F : A \rightarrow P(U)$ . In other Words, a soft set over U is a parametrized family of subsets of the universe U. For $e \in A$. F(e) may be considered as the set of e-approximate elements of the soft set (F,A) .

**Definition 2.2.** [3] For two soft sets (F,A) and (G,B) over a common universe U. we say that (F,A) is a soft subset of (G,B) if

- $A \subset B$, and
- $\forall e \in A$, F(e) and G(e) are identical approximations.

**Definition 2.3.** [3] Union of two soft sets of (F,A) and (G,B) over the common universe U is the soft set (H,C) where $C = A \cup B$, and $\forall\ e \in C$

$$
\begin{aligned}
H(e) &= F(e), \text{ if } e \in A - B,\\
&= G(e), \text{ if } e \in B - A,\\
&= F(e) \cup G(e) \text{ if } e \in A \cap B.
\end{aligned}
$$

We write $(F,A)\ \tilde{\cup}\ (G,B)=(H,C)$.

**Definition 2.4.** [3] Intersection of two soft sets of (F,A) and (G,B) over the common universe U is the soft set (H,C) where $C = A \cap B$, and $\forall e \in C$, H(e) = F (e) or G(e). We write $(F,A)\ \tilde{\cap}(G,B)=(H,C)$.

**Definition 2.5.** [8] Let U be a space of points(objects), with a generic element in U denoted by u. A neutrosophic set (N-set) A in U is characterized by a truth-membership function $T_A$, an indeterminancy-membership function $I_A$ and a falsity-membership function $F_A$. $T_A(U)$, $I_A(U)$ and $F_A(U)$ are real standard or nonstandard subsets of [0,1]. It can be written as $A=\{<u,(T_A(u),I_A(u),F_A(u))>:u\in U, T_A(u),I_A(u),F_A(u)\in [0,1]\}$. There is no restriction on the sum of $T_A(u)$, $I_A(u)$ and $F_A(u)$,so $0 \le \sup T_A(u)+ \sup I_A(u)+\sup F_A(u) \le 3$.

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**Definition 2.6.** [4] Let U be an initial universe set and E be a set of parameters. Consider E. Let P(U) denote the set of all neutrosophic sets of U. The collection (F,A) is termed to be the neutrosophic soft set over U, where F is a mapping given by $F: A \rightarrow P(U)$.

**Definition 2.7.** [4] Let (F,A) and (G,B) be two neutrosophic soft sets over the common universe U. (F,A) is said to be a neutrosphic soft subset of (G,B) if $A\subset B$. and $T_{F(e)}(x) \le T_{G(e)}(x), I_{F(e)}(x) \le I_{G(e)}(x), F_{F(e)}(x) \ge F_{G(e)}(x)\ \forall e\in A,\ x\in U$. We denote it by $(F,A)\subseteq (G, B)$.

**Definition 2.8.** [4] The complement of a neutrosophic soft set (F,A) denoted by $(F,A)^C=(F^C,\neg A)$ where $F^C:\neg A\rightarrow P(U)$ is a mapping given by $F^C(\alpha)$ = neutrosophic soft complement with $T_{F^C}(x)=F_F(x)$, $I_{F^C}(x)=I_F(x)$ and $F_{F^C}(x)=T_F(x)$.

**Definition 2.9.** [4] Let (H,A) and (G,B) be two NSSs over the common universe U. Then the union of (H,A) and (G,B) is denoted by "$(H,A)\tilde{\cup}(G,B)$" and is defined by $(H,A)\tilde{\cup}(G,B)=(K,C)$ where $C = A\cup B$ and the truth-membership, indeterminacy-membership and falsity membership of (K,C) are as follows:

$$T_{K(e)}(m)=\{\ T_{G(e)}(m), \text{ if } e\in A-B,\ T_{H(e)}(m), \text{ if } e\in B-A,\ \max(T_{G(e)}(m),T_{H(e)}(m)), \text{ if } e\in A\cap B.$$

$$I_{K(e)}(m)=\{\ I_{G(e)}(m), \text{ if } e\in A-B,\ I_{H(e)}(m), \text{ if } e\in B-A,\ \frac{I_{G(e)}(m)+I_{H(e)}(m)}{2}, \text{ if } e\in A\cap B.$$

$$F_{K(e)}(m)=\{\ F_{G(e)}(m), \text{ if } e\in A-B,\ F_{H(e)}(m), \text{ if } e\in B-A,\ \min(F_{G(e)}(m), F_{H(e)}(m)), \text{ if } e\in A\cap B.$$

**Definition 2.10.** [4] Let (H,A) and (G,B) be two NSSs over the common universe U. Then the intersection of (H,A) and (G,B) is denoted by "$(H,A)\tilde{\cap}(G,B)$" and is defined by $(H,A)\tilde{\cap}(G,B)=(K,C)$ where $C=A\cap B$ and the truth-membership,indeterminacy-membership and falsity membership of (K,C) are as follows:

$$T_{K(e)}(m) = \min(T_{H(e)}(m), T_{G(e)}(m)),$$

$$I_{K(e)}(m) = \frac{I_{G(e)}(m)+I_{H(e)}(m)}{2},$$

$$F_{K(e)}(m) = \max(F_{H(e)}(m), F_{G(e)}(m)), \text{ if } e\in A\cap B.$$

**Definition 2.11.** [9] Let $N^L$ be a neutrosophic soft set over U. $\tilde{\vee}$ and $\tilde{\wedge}$ be two binary operation on $N^L$. If elements of $N^L$ are equipped with two commutative and associative binary operations $\tilde{\vee}$ and $\tilde{\wedge}$ which are connected by the absorption law, then algebraic structure $(N^L,\tilde{\vee},\tilde{\wedge})$ is called Neutrosophic soft lattice.

**Theorem 2.12.** [9] Let $(N^L,\tilde{\vee},\tilde{\wedge})$ be a neutrosophic soft lattice and $F_A, F_B \in NS(U)$. Then $F_A\tilde{\wedge}F_B = F_A \Leftrightarrow F_A\tilde{\vee}F_B = F_B$.

**Theorem 2.13**. [9] Let $(N^L,\tilde{\vee},\tilde{\wedge})$ be a neutrosophic soft lattice and $F_A, F_B \in NS(U)$. Then the relation $\tilde{\leq}$ which is defined by $F_A\tilde{\leq}F_B \Leftrightarrow F_A\tilde{\wedge}F_B = F_A$ or $F_A\tilde{\vee}F_B = F_B$ is an ordering relation on NS(U).

**Theorem 2.14.** [9] Let ( $N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq}$ ) be a neutrosophic soft lattice and $F_A, F_B \in NS(U)$. Then $F_A \tilde{\vee} F_B$ and $F_A \tilde{\wedge} F_B$ are the least upperbound and the greatest lower bound of $F_A$ and $F_B$ respctively.

**Lemma 2.15**.[9] Let $N^L \in NS(U)$. Then neutrosophic soft lattice inclusion relation $\tilde{\subseteq}$ that is defined by $F_A \tilde{\subseteq} F_B \Leftrightarrow F_A \tilde{\cup} F_B = F_B$ or $F_A \tilde{\cap} F_B = F_A$ is an ordering relation on $N^L$.

**Definition 2.16**. [9] Let( $N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq}$) be a neutrosophic soft lattice and $N^M \tilde{\subseteq} N^L$.If $N^M$ is a neutrosophic soft lattice with operation of $N^L$, then $N^M$ is neutrosophic soft sublattice of $N^L$.

**Theorem 2.17.** [9] Let ( $N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq}$ ) be a neutrosophic soft lattice and $N^M \tilde{\subseteq} N^L$. If $F_A \tilde{\vee} F_B \in N^M$ and $F_A \tilde{\wedge} F_B \in N^M$ for all $F_A, F_B \in N^M$,then $N^M$ is a neutrosophic soft sublattice.

**Definition 2.18.** [9] Let ( $N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq}$ ) be a neutrosophic soft lattice and let $F_A \in N^L$. If $F_A \tilde{\leq} F_B$ for all $F_B \in N^L$, then $F_A$ is called the minimum element of $N^L$. If $F_B \tilde{\leq} F_A$ forall $F_B \in N^L$, then $F_A$ is called the maximum element of $N^L$.

**Definition 2.19.** [9] Let ( $N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq}$ )be a neutrosophic soft lattice and let $F_A \in N^L$. If $F_B \tilde{\leq} F_A$ or $F_A \tilde{\leq} F_B$ for all $F_A, F_B \in N^L$, then $N^L$ is called a neutrosophic soft chain.

**Example 2.20.** Let $U = \{u_1,u_2,u_3\}$be a universe set and $N^L = \{F_A,F_B,F_C,F_D\}$.

Where $N^L \subseteq NS(U)$. $A=\{e_1\}$, $B =\{e_1,e_2\}$, $C =\{e_1,e_3\}$, $D =\{e_1,e_2,e_3\}$ where $A,B,C,D \subseteq E$.

Suppose that, $F_A =\{(e_1, \frac{u_1}{0.5,0.2,0.6})\}$

$F_B =\{(e_1, \frac{u_1}{0.6,0.2,0.5}), (e_2, \frac{u_2}{0.4,0.2,0.7})\}$

$F_C =\{(e_1, \frac{u_1}{0.7,0.2,0.4}), (e_3, \frac{u_3}{0.3,0.4,0.6})\}$

$F_D =\{(e_1, \frac{u_1}{0.7,0.2,0.4}), (e_2, \frac{u_3}{0.5,0.2,0.6}), (e_3, \frac{u_3}{0.4,0.4,0.5})\}$

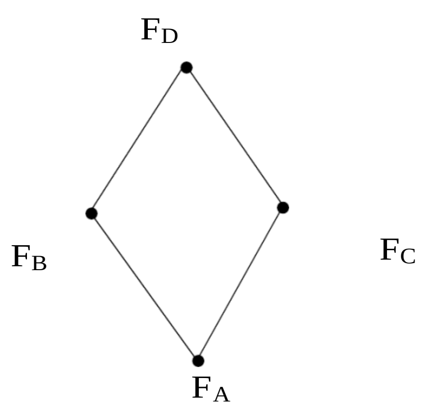


Fig 1: Neutrosophic soft sublattice

A neutrosophic soft subset $N^S = \{F_A, F_B\} \tilde{\subseteq} NS(U)$ of $N^L$ is a neutrosophic soft chain. Here we take $N^S = \{F_B, F_C\}$ which is not a neutrosophic soft chain. Since $F_B$ and $F_C$ are uncomparable elements.

**Definition 2.21.** [9] Let( $N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq}$ ) be a neutrosophic soft lattice. If $N^L$ satisfies the following axioms, it is called a distributive neutrosophic soft lattice.

(i) $F_A \tilde{\vee} (F_B \tilde{\wedge} F_C) = (F_A \tilde{\vee} F_B) \tilde{\wedge} (F_A \tilde{\vee} F_C)$

(ii) $F_A \tilde{\wedge} (F_B \tilde{\vee} F_C) = (F_A \tilde{\wedge} F_B) \tilde{\vee} (F_A \tilde{\wedge} F_C)$ for all $F_A, F_B$ and $F_C \in N^L$.

**Definition 2.22.** [9] Let ( $N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq}$ ) be a neutrosophic soft lattice. Then $N^L$ is called a neutrosophic soft modular lattice, if it is satisfies the following property:

$$F_C \tilde{\leq} F_A \Rightarrow F_A \tilde{\wedge} (F_B \tilde{\vee} F_C) = (F_A \tilde{\wedge} F_B) \tilde{\vee} F_C$$

for all $F_A, F_B, F_C \in N^L$.

## 3. Median of Neutrosophic Soft Lattices

In this section, we define the median of neutrosophic soft lattices and prove some theorems related to neutrosophic soft distributive and neutrosophic soft modular lattices with an example.

**Definition 3.1.** Let ($N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq}$ ) be a neutrosophic soft lattice. Then $F_A, F_B, F_C \in N^L$ which satisfies the condition

$$(F_A \tilde{\wedge} F_B) \tilde{\vee} (F_B \tilde{\wedge} F_C) \tilde{\vee} (F_C \tilde{\wedge} F_A) = (F_A \tilde{\vee} F_B) \tilde{\wedge} (F_B \tilde{\vee} F_C) \tilde{\wedge} (F_C \tilde{\vee} F_A)$$

is called the median of $F_A, F_B, F_C$ and is denoted by $med(F_A, F_B, F_C)$.

**Remark 3.2.** For any $F_A, F_B, F_C \in N^L$ $med(F_A, F_B, F_C) = F_B$ if and only if $F_A \tilde{\wedge} F_C \tilde{\leq} F_B \tilde{\leq} F_A \tilde{\vee} F_C$.

**Theorem 3.3.** A neutrosophic soft lattice ($N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq}$ ) be a neutrosophic soft distributive lattice if and only if every one of its triplet of elements has a median.

**Proof**. Let ($N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq}$) be a neutrosophic soft distributive lattice.

Let $F_A, F_B, F_C \in N^L$

$$\begin{aligned}
(F_A \tilde{\vee} F_B) \tilde{\wedge} (F_B \tilde{\vee} F_C) \tilde{\wedge} (F_C \tilde{\vee} F_A) &= ((F_A \tilde{\vee} F_B) \tilde{\wedge} (F_B \tilde{\vee} F_C)) \tilde{\wedge} (F_C \tilde{\vee} F_A) \\
&= (((F_A \tilde{\vee} F_B) \tilde{\wedge} (F_B \tilde{\vee} F_C)) \tilde{\wedge} F_C) \tilde{\vee} (((F_A \tilde{\vee} F_B) \tilde{\wedge} (F_B \tilde{\vee} F_C)) \tilde{\wedge} F_A) \\
&= (F_A \tilde{\vee} F_B) \tilde{\wedge} ((F_B \tilde{\vee} F_C) \tilde{\wedge} F_C) \tilde{\vee} (F_A \tilde{\wedge} (F_A \tilde{\vee} F_B)) \tilde{\wedge} (F_B \tilde{\vee} F_C) \\
&= ( (F_A \tilde{\vee} F_B) \tilde{\wedge} F_C) \tilde{\vee} (F_A \tilde{\wedge} (F_B \tilde{\vee} F_C))
\end{aligned}$$

$=((F_A \tilde{\wedge} F_B) \tilde{\vee} (F_B \tilde{\wedge} F_C)) \tilde{\vee} ((F_A \tilde{\wedge} F_B) \tilde{\vee} (F_C \tilde{\wedge} F_A))$

$=(F_A \tilde{\wedge} F_B) \tilde{\vee} (F_B \tilde{\wedge} F_C) \tilde{\vee} (F_C \tilde{\wedge} F_A)$

Hence, every triplet elements of $(N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq})$ has a median.

Conversely, assume that every triplet of elements of $(N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq})$ has a median.

To prove that $(N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq})$ is a neutrosophic soft distributive lattice.

Let $F_A, F_B, F_C \in N^L$

$F_A \tilde{\wedge} (F_B \tilde{\vee} F_C) = (F_A \tilde{\wedge} (F_A \tilde{\vee} F_B)) \tilde{\wedge} (F_B \tilde{\vee} F_C)$

$= ((F_A \tilde{\wedge} (F_A \tilde{\vee} F_C)) \tilde{\wedge} (F_A \tilde{\vee} F_B)) \tilde{\wedge} (F_B \tilde{\vee} F_C)$

$= F_A \tilde{\wedge} ((F_A \tilde{\vee} F_C) \tilde{\wedge} (F_A \tilde{\vee} F_B)) \tilde{\wedge} (F_B \tilde{\vee} F_C))$

$= F_A \tilde{\wedge} ((F_A \tilde{\wedge} F_C) \tilde{\vee} (F_A \tilde{\wedge} F_B)) \tilde{\vee} (F_B \tilde{\wedge} F_C))$

$= (F_A \tilde{\wedge} (F_B \tilde{\wedge} F_C)) \tilde{\vee} ((F_A \tilde{\wedge} F_B) \tilde{\vee} (F_A \tilde{\wedge} F_C))$

$= ((F_A \tilde{\wedge} F_B) \tilde{\wedge} F_C)) \tilde{\vee} ((F_A \tilde{\wedge} F_B) \tilde{\vee} (F_A \tilde{\wedge} F_C))$

$= (((F_A \tilde{\wedge} F_B) \tilde{\wedge} F_C)) \tilde{\vee} ((F_A \tilde{\wedge} F_B)) \tilde{\vee} (F_A \tilde{\wedge} F_C)$

$= ((F_A \tilde{\wedge} F_B) \tilde{\vee} ((F_A \tilde{\wedge} F_B) \tilde{\wedge} F_C))) \tilde{\vee} (F_A \tilde{\wedge} F_C)$

$= (F_A \tilde{\wedge} F_B) \tilde{\vee} (F_A \tilde{\wedge} F_C)$

Therefore $(N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq})$ is a neutrosophic soft distributive lattice .

**Theorem 3.4.** A Neutrosophic soft lattice $(N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq})$ is a neutrosophic soft modular lattice if and only if every triplet of element $F_A, F_B, F_C (F_C \tilde{\leq} F_A)$ has a median.

**Proof.** Let $(N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq})$ be a neutrosophic soft modular lattice.

For all $F_A, F_B, F_C \in N^L, F_C \tilde{\leq} F_A$

$(F_A \tilde{\wedge} F_B) \tilde{\vee} (F_A \tilde{\wedge} F_C) \tilde{\vee} (F_A \tilde{\wedge} F_C) = (F_A \tilde{\wedge} F_B) \tilde{\vee} (F_A \tilde{\wedge} F_C) \tilde{\vee} F_C$

$= (F_A \tilde{\wedge} F_B) \tilde{\vee} ((F_A \tilde{\wedge} F_C) \tilde{\vee} F_C)$

$= (F_A \tilde{\wedge} F_B) \tilde{\vee} F_C$.........(1)

$(F_A \tilde{\vee} F_B) \tilde{\wedge} (F_B \tilde{\vee} F_C) \tilde{\wedge} (F_A \tilde{\vee} F_C) = (F_A \tilde{\vee} F_B) \tilde{\wedge} (F_B \tilde{\vee} F_C) \tilde{\wedge} F_A$

$= (F_A \tilde{\wedge} (F_A \tilde{\vee} F_B)) \tilde{\wedge} (F_B \tilde{\vee} F_C)$

$= F_A \tilde{\wedge} (F_B \tilde{\vee} F_C)$.......(2)

from (1) and (2),

$(F_A \tilde{\wedge} F_B) \tilde{\vee} (F_A \tilde{\wedge} F_C) \tilde{\vee} (F_A \tilde{\wedge} F_C) = (F_A \tilde{\vee} F_B) \tilde{\wedge} (F_B \tilde{\vee} F_C) \tilde{\wedge} (F_A \tilde{\vee} F_C)$.

Conversely assume that every triplet elements of a $(N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq})$ has a median.

To prove that $(N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq})$ is a neutrosophic soft modular lattice

For every triplet $F_A, F_B, F_C \in N^L, F_C \tilde{\leq} F_A$

$(F_A \tilde{\wedge} F_B) \tilde{\vee} (F_A \tilde{\wedge} F_C) \tilde{\vee} (F_A \tilde{\wedge} F_C) = (F_A \tilde{\vee} F_B) \tilde{\wedge} (F_B \tilde{\vee} F_C) \tilde{\wedge} (F_A \tilde{\vee} F_C)$

We have $(F_A \tilde{\wedge} F_B) \tilde{\vee} (F_A \tilde{\wedge} F_C) \tilde{\vee} F_C = (F_A \tilde{\vee} F_B) \tilde{\wedge} (F_B \tilde{\vee} F_C) \tilde{\wedge} F_A$

$(F_A \tilde{\wedge} F_B) \tilde{\vee} ((F_A \tilde{\wedge} F_C) \tilde{\vee} F_C) = (F_A \tilde{\wedge} (F_A \tilde{\vee} F_B)) \tilde{\wedge} (F_B \tilde{\vee} F_C)$

$(F_A \tilde{\wedge} F_B) \tilde{\vee} F_C = F_A \tilde{\wedge} (F_B \tilde{\vee} F_C)$

Therefore $(N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq})$ is a neutrosophic soft modular lattice.

**Example 3.5.** Let $U = \{u_1,u_2,u_3,u_4,u_5\}$ be a universe set and $N^L = \{F_A,F_B,F_C,F_D,F_G,F_J,F_K\}$ Where $N^L \subseteq NS(U)$. $A = \{e_1\}$, $B = \{e_1, e_2\}$, $C = \{e_1, e_3\}$, $D = \{e_1, e_4\}$, $G = \{e_1, e_2, e_3\}$, $H = \{e_1, e_2, e_4\}$, $J = \{e_1, e_3, e_4\}$ where $A,B,C,D,G,H,J,K \subseteq E$.

Suppose that, $F_A = \{(e_1, \frac{u_1}{0.2,0.3,0.8})\}$

$F_B = \{(e_1, \frac{u_1}{0.3,0.3,0.7}, \frac{u_2}{0.3,0.2,0.7}), (e_2, \frac{u_2}{0.5,0.3,0.6})\}$

$F_C = \{(e_1, \frac{u_1}{0.4,0.3,0.6}, \frac{u_3}{0.2,0.4,0.6}), (e_3, \frac{u_3}{0.4,0.1,0.7})\}$

$F_D = \{(e_1, \frac{u_1}{0.4,0.3,0.6}, \frac{u_4}{0.3,0.2,0.7}), (e_4, \frac{u_4}{0.5,0.3,0.8})\}$

$F_G = \{(e_1, \frac{u_1}{0.5,0.3,0.5}, \frac{u_2}{0.4,0.2,0.6}, \frac{u_3}{0.3,0.4,0.4}, \frac{u_4}{0.4,0.2,0.6}), (e_2, \frac{u_2}{0.6,0.3,0.5}, \frac{u_3}{0.3,0.2,0.6}), (e_3, \frac{u_3}{0.5,0.1,0.6} \frac{u_4}{0.4,0.2,0.8})\}$

$F_H = \{(e_1, \frac{u_1}{0.5,0.3,0.4}, \frac{u_2}{0.4,0.2,0.6}, \frac{u_3}{0.3,0.4,0.5}, \frac{u_4}{0.4,0.2,0.6}), (e_2, \frac{u_2}{0.6,0.3,0.5}, \frac{u_3}{0.4,0.2,0.5}), (e_4, \frac{u_4}{0.6,0.3,0.7} \frac{u_5}{0.5,0.4,0.6})\}$

$F_J = \{(e_1, \frac{u_1}{0.5,0.3,0.5}, \frac{u_3}{0.3,0.4,0.5}, \frac{u_4}{0.4,0.2,0.6}), (e_3, \frac{u_3}{0.5,0.1,0.6}, \frac{u_4}{0.5,0.1,0.6}), (e_4, \frac{u_4}{0.6,0.3,0.7} \frac{u_5}{0.5,0.4,0.6})\}$

$F_H = \{(e_1, \frac{u_1}{0.6,0.3,0.4}, \frac{u_2}{0.5,0.3,0.5}, \frac{u_3}{0.4,0.4,0.4}, \frac{u_4}{0.5,0.3,0.5}), (e_2, \frac{u_2}{0.7,0.3,0.4}, \frac{u_3}{0.4,0.2,0.4}, \frac{u_4}{0.5,0.1,0.6}), (e_3, \frac{u_3}{0.6,0.1,0.5}, \frac{u_4}{0.6,0.2,0.5}),$
$(e_4, \frac{u_4}{0.7,0.3,0.6} \frac{u_5}{0.7,0.4,0.4})\}$

Then $(N^L, \tilde{\vee}, \tilde{\wedge}, \tilde{\leq})$ given in figure 2 is *a* neutrosophic soft distributive lattice.

For any element $F_A, F_D, F_J \in N^L$, then $med(F_A,F_D,F_J) = F_D$ (since $F_A \tilde{\wedge} F_J \leq F_D \leq F_A \tilde{\vee} F_J$)

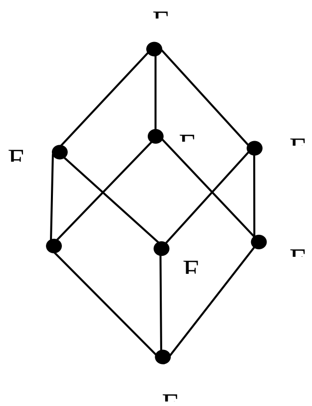

Fig2: Neutrosophic soft distributive lattice

## CONCLUSION

In this paper, we proved some theorems on neutrosophic soft distributive and modular lattices using the concept of median with an example. We are studying about these neutrosophic soft lattices and are expected to give some more results in our future study.

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