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Not peer-reviewed version

Big Sets Of Vertices

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Posted Date: 7 June 2021

doi: 10.20944/preprints202106.0189.v1

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Preprints.org (www.preprints.org) | NOT PEER-REVIEWED | Posted: Posted: 7 June 2021 doi:10.20944/preprints202106.0189.v1

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Abstract

In this article, some notions about set, weight of set, number, number's position, special vertex are introduced. Some classes of graph under these new notions have been opted as if the study on the special attributes of these new notion when they've acted amid each other is considered. Internal and external relations amid these new notions have been obtained as if some classes of graphs in the matter of these notions are been pointed out.

Keywords: Special Set, Set's Weight, Special Number, Number's Position.
AMS Subject Classification: 05C17, 05C22, 05E45, 05E14

1 Preliminary On The Concept

I'm going to refer to some books which are cited to the necessary and sufficient material which are covering the introduction and the preliminary of this outlet so look [**Ref.** [1], **Ref.** [2], **Ref.** [3], **Ref.** [4]] where **Ref.** [1] is about the textbook, **Ref.** [2] is common, **Ref.** [3] has good ideas and **Ref.** [4] is kind of disciplinary approaches in the good ways. Further references could be referred and could be addressed in **Refs.** [5–11].

2 Definition And Its Clarification

Definition 2.1. Let $\mathcal{G} : (\mathcal{V}, \mathcal{E})$ be a graph. Then

- $\mathcal{B}$ is renamed to be **BIG** set if $\forall x \in \mathcal{V}$, there is $m \in \mathcal{B}$ such that $\mathcal{N}(x) \cap \mathcal{N}(m) \neq \emptyset$;
- if $\mathcal{B} = \{\mathcal{M}_1, \mathcal{M}_2, \cdots, \mathcal{M}_n\}$ and $\forall \mathcal{M}_i \in \mathcal{B} : \mathcal{N}(x) \cap \mathcal{N}(\mathcal{M}_i) = \mathcal{N}_i \neq \emptyset$, then the set of numbers $(\mathcal{M}_1\mathcal{M}_2 \cdots \mathcal{M}_n)$ is **BIG** weight of $\mathcal{B}$;
- the greatest number is renamed to **BIG** number;
- number's position is renamed to **BIG** position;
- corresponded vertex is renamed to **BIG** vertex.

3 Relationships And Its illustrations

Theorem 3.1. *Let $\mathcal{G} : (\mathcal{V}, \mathcal{E})$ be a complete graph. Then*

- *$\mathcal{B}$ is renamed to be* ***BIG*** *set cause $\forall x \in \mathcal{V}$, there is $\mathcal{M} \in B$ such that $\mathcal{N}(x) \cap \mathcal{N}(\mathcal{M}) \neq \emptyset$;*
- *$\mathcal{B} = \{\mathcal{M}_1\}$ and $\forall M_i \in \mathcal{B} : \mathcal{N}(x) \cap \mathcal{N}(\mathcal{M}_i) = \mathcal{V}(\mathcal{G}) - \{M_1\} \neq \emptyset$, then the set of numbers $(\mathcal{M}_1)$ is* ***BIG*** *weight of $\mathcal{B}$;*
- ***BIG*** *number is $\mathcal{O}(\mathcal{G}) - 1$;*
- ***BIG*** *position is one;*
- ***BIG*** *vertex is $\mathcal{M}_1$.*

Theorem 3.2. *Let $\mathcal{G} : (\mathcal{V}, \mathcal{E})$ be a complete bipartite graph. Then*

- *$\mathcal{B}$ is renamed to be* ***BIG*** *set cause $\forall x \in \mathcal{V}$, there is $\mathcal{M} \in B$ such that $\mathcal{N}(x) \cap \mathcal{N}(\mathcal{M}) \neq \emptyset$;*
- *$\mathcal{B} = \{\mathcal{M}_1, \mathcal{M}_2\}$ and $\forall M_i \in \mathcal{B} : \mathcal{N}(x) \cap \mathcal{N}(\mathcal{M}_i) = \mathcal{V}(\mathcal{G}) - \{\mathcal{M}_1, \mathcal{M}_2\} \neq \emptyset$, then the set of numbers $(\mathcal{M}_1\mathcal{M}_2)$ is* ***BIG*** *weight of $\mathcal{B}$;*
- ***BIG*** *number is $\mathcal{O}(\mathcal{G}) - 2$;*
- ***BIG*** *position is one;*
- ***BIG*** *vertex is $\mathcal{M}_1$.*

Theorem 3.3. *Let $\mathcal{G} : (\mathcal{V}, \mathcal{E})$ be a star graph. Then*

- *$\mathcal{B}$ is renamed to be* ***BIG*** *set cause $\forall x \in \mathcal{V}$, there is $\mathcal{M} \in B$ such that $\mathcal{N}(x) \cap \mathcal{N}(\mathcal{M}) \neq \emptyset$;*
- *$\mathcal{B} = \{\mathcal{M}_1, \mathcal{M}_2\}$ and $\forall M_i \in \mathcal{B} : \mathcal{N}(x) \cap \mathcal{N}(\mathcal{M}_i) = \mathcal{V}(\mathcal{G}) - \{\mathcal{M}_1, \mathcal{M}_2\} \neq \emptyset$, then the set of numbers $(\mathcal{M}_1\mathcal{M}_2)$ is* ***BIG*** *weight of $\mathcal{B}$;*
- ***BIG*** *number is $\mathcal{O}(\mathcal{G}) - 2$;*
- ***BIG*** *position is one;*
- ***BIG*** *vertex is $\mathcal{M}_1$.*

Theorem 3.4. *Let $\mathcal{G} : (\mathcal{V}, \mathcal{E})$ be a path graph. Then*

- *$\mathcal{B}$ is renamed to be* ***BIG*** *set cause $\forall x \in \mathcal{V}$, there is $\mathcal{M} \in B$ such that $\mathcal{N}(x) \cap \mathcal{N}(\mathcal{M}) \neq \emptyset$;*
- *$\mathcal{B} = \{\mathcal{M}_2, \mathcal{M}_4, \cdots, \mathcal{M}_{\frac{n}{2}}\}$ and $\forall M_i \in \mathcal{B} : \mathcal{N}(x) \cap \mathcal{N}(\mathcal{M}_i) = \mathcal{V}(\mathcal{G}) - \{\mathcal{M}_2, \mathcal{M}_4, \cdots, \mathcal{M}_{\frac{n}{2}}\} \neq \emptyset$, then the set of numbers $(\mathcal{M}_2\mathcal{M}_4 \cdots, \mathcal{M}_{\frac{n}{2}})$ is* ***BIG*** *weight of $\mathcal{B}$;*
- ***BIG*** *number is $\mathcal{O}(\mathcal{G}) - \frac{n}{2}$;*
- ***BIG*** *position is two;*
- ***BIG*** *vertex is $\mathcal{M}_2$.*

Theorem 3.5. *Let $\mathcal{G} : (\mathcal{V}, \mathcal{E})$ be a cycle graph. Then*

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- *$\mathcal{B}$ is renamed to be **BIG** set cause $\forall x \in \mathcal{V}$, there is $\mathcal{M} \in B$ such that $\mathcal{N}(x) \cap \mathcal{N}(\mathcal{M}) \neq \emptyset$;*
- *$\mathcal{B} = \{\mathcal{M}_2, \mathcal{M}_4, \cdots, \mathcal{M}_{\frac{n}{2}}\}$ and $\forall M_i \in \mathcal{B} : \mathcal{N}(x) \cap \mathcal{N}(\mathcal{M}_i) = \mathcal{V}(\mathcal{G}) - \{\mathcal{M}_2, \mathcal{M}_4, \cdots, \mathcal{M}_{\frac{n}{2}}\} \neq \emptyset$, then the set of numbers $(\mathcal{M}_2\mathcal{M}_4 \cdots, \mathcal{M}_{\frac{n}{2}})$ is **BIG** weight of $\mathcal{B}$;*
- ***BIG** number is $\mathcal{O}(\mathcal{G}) - \frac{n}{2}$;*
- ***BIG** position is two;*
- ***BIG** vertex is $\mathcal{M}_2$.*

4 Results And Its Beyond

Theorem 4.1. *Let $\mathcal{G} : (\mathcal{V}, \mathcal{E})$ be a graph and $\mathcal{A}_1, \mathcal{A}_2$. If $\mathcal{B}_3 = \mathcal{B}_1 \cap \mathcal{B}_2$, then $\mathcal{A}_1 = \mathcal{B}_1,\ \mathcal{A}_2 = \mathcal{B}_2$.*

Theorem 4.2. *Let $\mathcal{G} : (\mathcal{V}, \mathcal{E})$ be a graph. Then $\mathcal{B}_3 = \mathcal{B}_1 \cup \mathcal{B}_2$.*

Theorem 4.3. *Let $\mathcal{G} : (\mathcal{V}, \mathcal{E})$ be a graph $\mathcal{B}$. If $\mathcal{B} \subseteq \mathcal{A}$ then $\mathcal{B}_3 = \mathcal{A}$.*

Theorem 4.4. *Let $\mathcal{G} : (\mathcal{V}, \mathcal{E})$ be a graph $\mathcal{B}$ is minimal set. If $\mathcal{B} \subseteq \mathcal{A}$ then $\mathcal{B}_3 = \mathcal{A}$.*

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