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Graph Theory Applications and Use in Real Life

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Abstract

Since the creation of the universe, dominance and rivalry have existed. Smaller stars are subjugated by and drawn towards larger stars. Nothing in our universe can exist without phenomena like dominance and rivalry. Animals and creatures that are stronger have the upper hand. Once more, competition arises between strong dominants when there are several of them. Here, we offer a domination competition graph that measures both dominance and competition simultaneously and allows us to pinpoint the variables that are both most competitive and dominant.

We determine which protuberances (as soon as we create a graph related acuity) are stronger and by in what way much by using the prevailing competition number. As an illustration, consider the network of forest biodiversity. In the end, an e-commerce industry application of dominance competitions

Keywords: Graph Theory, Variables

1. Introduction

Dominance refers to having power over someone, something, or the situation in which they have such power. The strongest people consistently rule over the weakest. Since the beginning of the formation of the planet, it has existed. Not just for humans, but also for other animals, there is dominion. Around the middle of the 20th century, graph theory research got underway. O. Ore coined the terms "domination" and "domination number" in 1962. Now, at the start of the twenty-first century, graph theory has been constructed using a different methodology. When two or more parties work together to accomplish a single, unbreakable objective, competition results. One makes money by taking advantage of the losses of others. "Competition" refers to rivalry between entities such as people, businesses, and other organizations.

In nature, coexisting species that share a habitat compete with one another. For food, water, mates, and other biological resources, all creatures are in competition. Typically, competition for food and other resources exists. When these conditions are met, more serious conflicts arise in the pursuit of wealth.

In a routine or unchanging environment, men compete for power, position, and notoriety. Cohen initially proposed competition in a graph theory in 1969. Earlier in 1994 produced a p-competition grid of a digraph, and as a result, opposition is no longer restricted to artless graph scheme but consumes been expanded to include hyper grid, fuzzy grid,and other areas as well.

Several mathematicians have studied graph theory's domination and competition separately during the past 60 years. Yet, nobody has yet produced a paper that examines dominance and competition together.

In this article, we provide a novel concept called a "dominating competition graph." In light of this, we aim to provide a clear understanding of the graph theory-related topic of domination and competition. In some instances, dominance and competition are seen in the natural world side by side. Examples include biodiversity, commercial goals, and other situations where these two concepts are intertwined.

As an illustration, let's look at a few specific characteristics connected to forest biodiversity. Lion, Tiger, Deer, and Buffalo are each represented by a node in the diagram below (fig. 1), and the relationship between them is depicted.As a rule, at least three Graph Theory specialists have assessed each proposal.

The published papers in this special issue are then quickly reviewed in ascending order of when they were published. In this special issue, we hope that readers will find intriguing theoretical concepts and those academics will discover fresh sources of inspiration for upcoming publications.

Aimed atthiscircumstance,

$$\deg^{+}(n(1))=1, \quad \deg^{+}(n(2))=3, \quad \deg^{+}(n(3))=2, \quad \deg^{+}(n(4))=2$$

So, after the controlling competition chart, we container approximately that Lion ((2)) dominants altogether thefaunaeandTiger((3)),Cheetah((1))remainpowerfulanimalcorrespondingly.

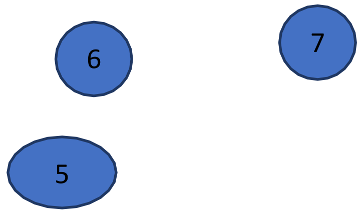

Fig.1:Fixedgraphandit'scontrollingoppositiongraph

2. Preliminaries:

Graph

A linear graph H = (U, F), is throughactive of a set $V = \{u_1, u_2, \ldots\}$,apogees,themes, or nodes of Hthen a set $F = \{f_1, f_2, \ldots\}$, limits, which staytwosomes of apexes that remain not associated inseveralprecisedemand.

Digraph

In graph philosophy, anabsorbed graph is uniquekind of diagram in which nodesremainlinkedthroughabsorbed lines, or"arcs."

Vertex's grade

The integer of superioritiesepisode on a vertex$v$ in a grid, is termed the gradationofthe vertex$v$.

The in grade and out grade of a vertex remain the integer of head-to-head heads topsthen tails trimmings,correspondingly, of thatpinnacle.

Supervisory set of a chart

A subsection$D$ of a vertex conventionalU of a chartH = (U, F), is baptizedcontrollingset on behalf ofHif $\forall x \notin D$is end-to-endto at least unique$y \in D (\forall\ x, y \in V)$.

Competition of a graph:

LetH = (U, F) remain a digraph. A diagram$H' = (U, F')$is supposed to stand aoppositiondiagramif$(\bar{x},\bar{y}),(\bar{z},\bar{y})$∈Finfers$(x,z)$∈F′.

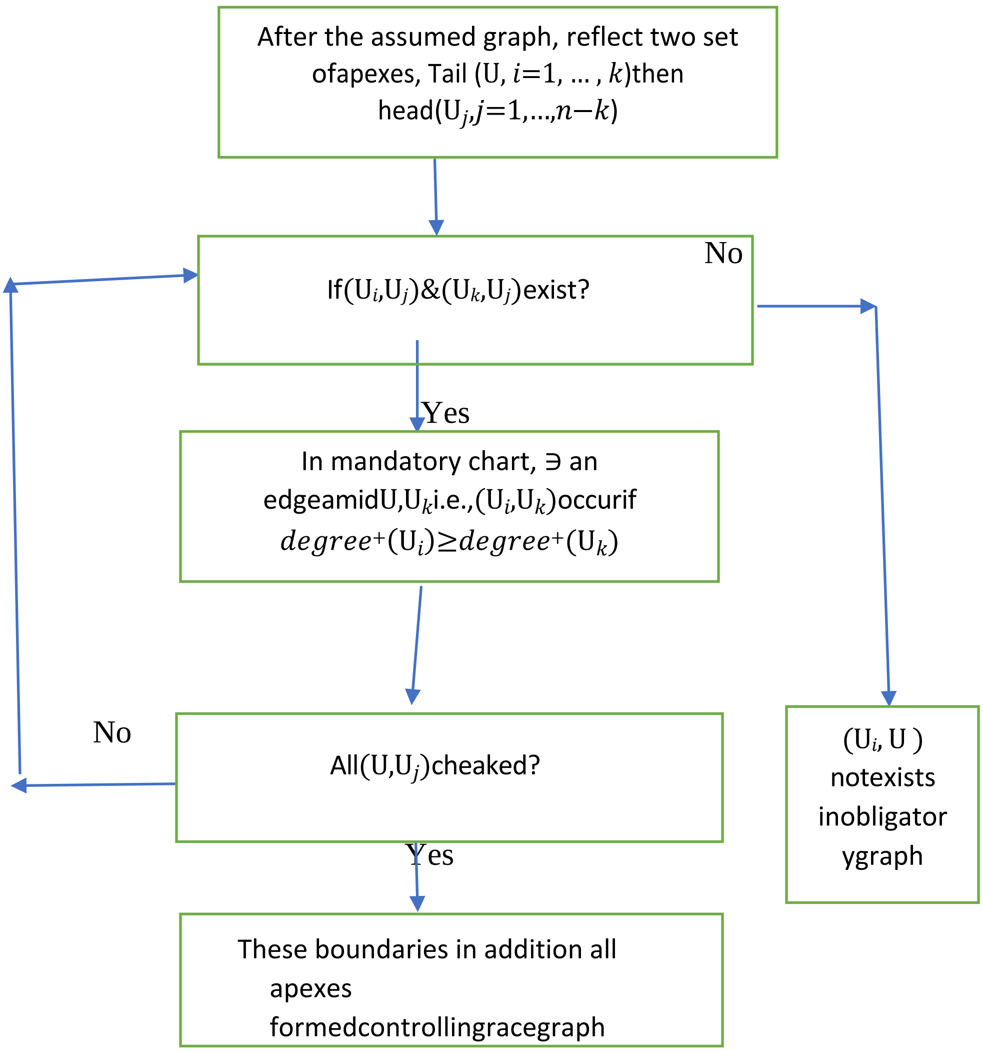

Fig.2: Flowchart

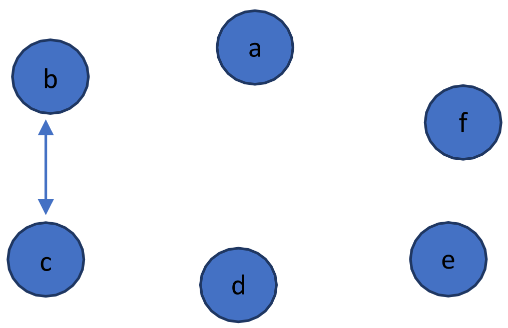

Fig.3:p-dominatingwardigraph

Aimed atthis digraph,$p=6-2=4$

Remark:

A p-dominatingrace graph comprisesatleast$p$inaccessible vertex.

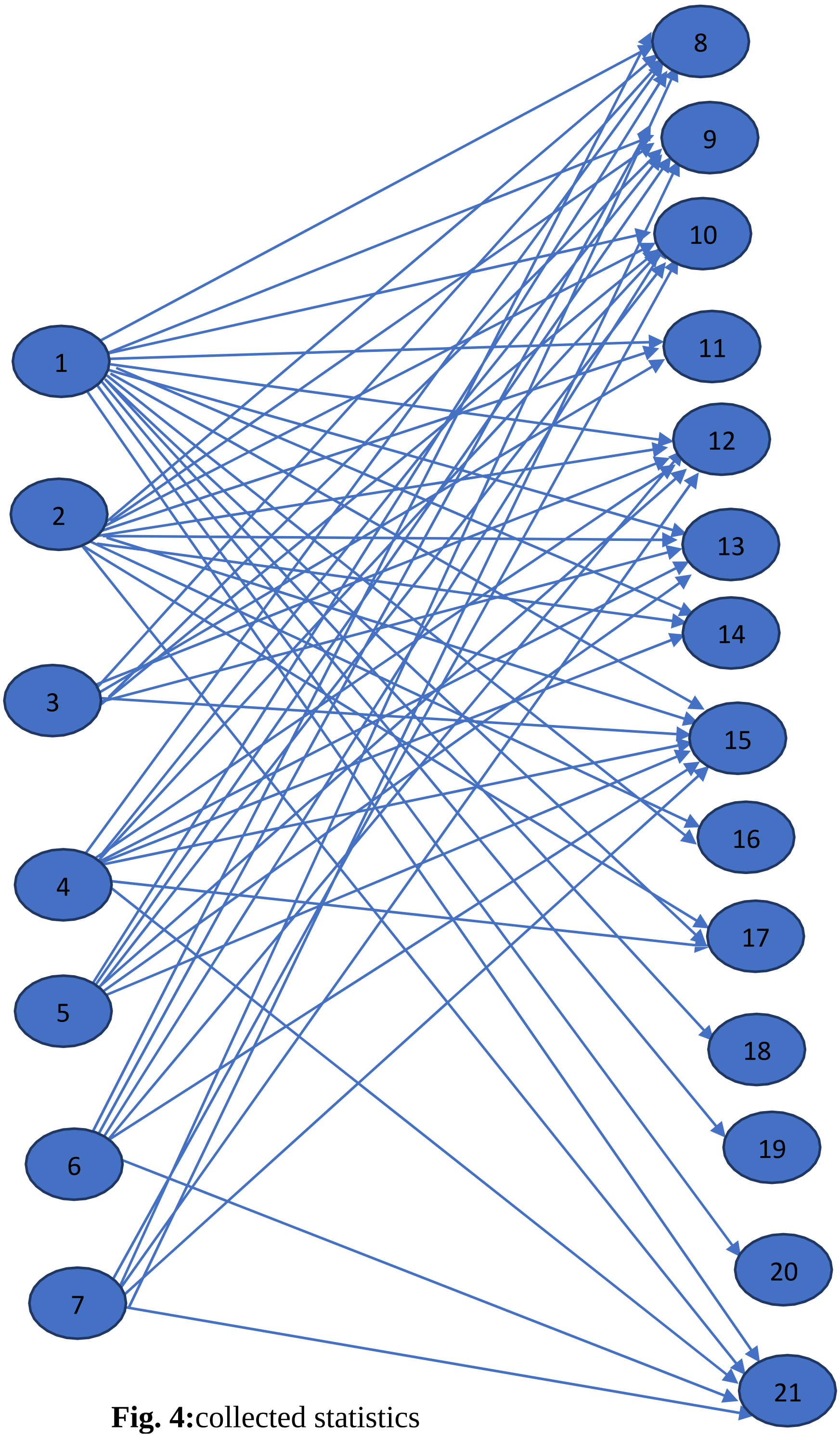

Fig. 4:collected statistics

	Ecommerceplatform							
Segmentt		Amazon	Flipchart	Memesh	snapdeals	Tatacliq	Myntra	Ajio
	Garb	1	1	1	1	1	1	1
	accessories	1	1	1	1	1	1	1
	health	1	1	1	1	1	1	1
	Provisions	1	1	1	0	0	0	0
	Jewelry	1	1	1	1	1	1	1
	gadgets	1	1	1	1	1	0	0
	CPU	1	1	0	1	0	0	0
	bakery appliances	1	1	1	1	1	1	1
	Equipment's	1	1	0	0	0	0	0
	stationaries	1	1	0	1	0	0	0
	bill Expense	1	0	0	0	0	0	0
	Media	1	0	0	0	0	0	0
	Expense Wallet	1	0	0	0	0	0	0
	Ownproductcreation	1	1	0	1	0	1	1

Table1:Equivalentmatrix ofcharacter

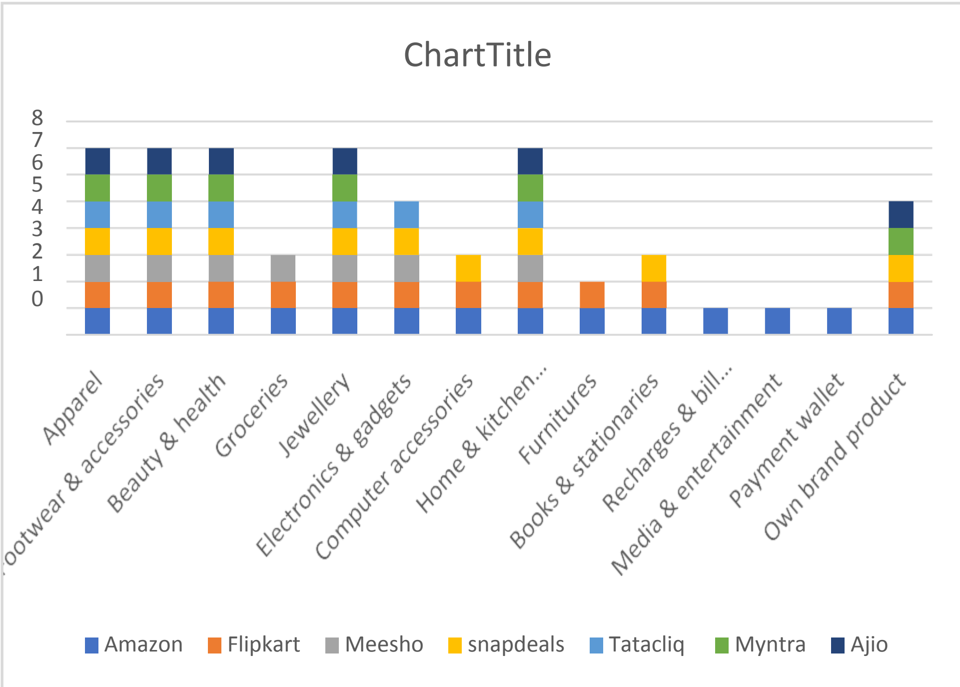

Fig. 5: Graphicalrepresentation

3. Result:

Fortheoverheadgraph(Figure-),tailapexesare{1 to 7}andheadverticesare, {8 to 21}.

Here{(1,8),(2,8),(3,8),(7,8)},{(1,9),(2,9),(3,9),…,(7,9)},{(1,10),(2,10),(3,10),… ,(7,10)},{(2,11),(3,11)},{(1,12),(2,12),(3,12),…,(7,12)},{(2,13),…, (5,13)},{(1,14),(4,14)},{(1,15),(2,15),…,(7,15)},{(1,16),(2,16)},{(1,17), (2,17),(4,17)},{(1,21),(4,21),(6,21),(7,21)} exists.

And $degree^{+}(n(1))=14$,$degree^{+}(n(2))=11$, $degree^{+}(n(3))=7$, $degree^{+}(n(4))=9$,$degree^{+}(n(5))=6$,$degree^{+}(n(6))=6$,$degree^{+}(n(7))=6$

∴Thepowercompetition diagramoftheoverheaddigraph(Fig. 6)isassumedshout,

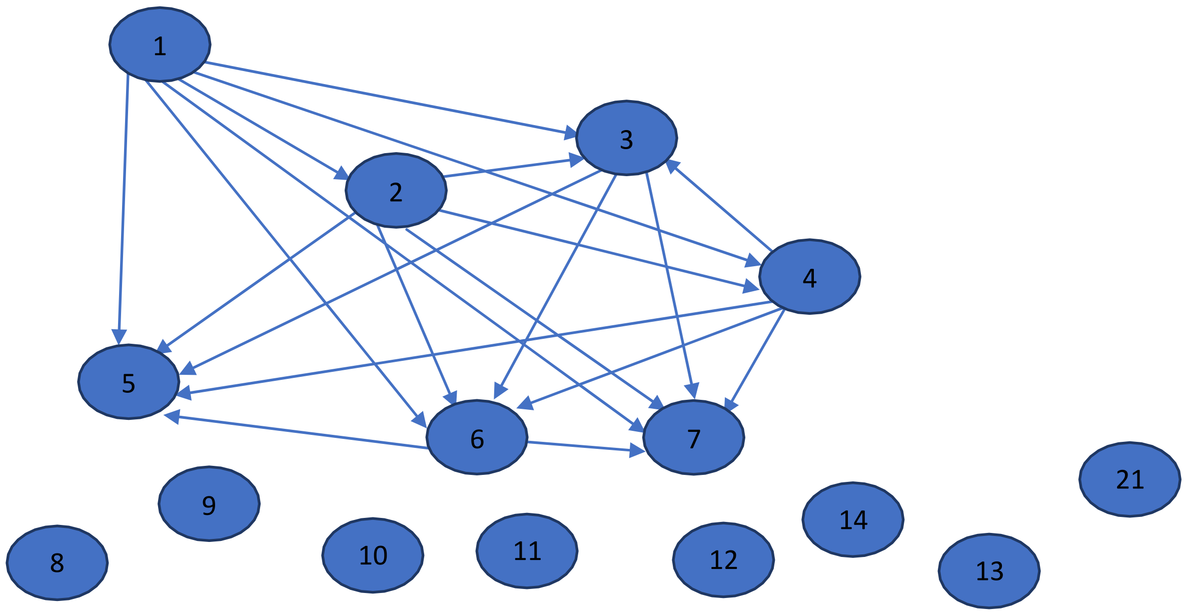

Fig. 6: Dominating Competition

	Amazon	Flipkart	Meesho	snapdeals	Tata Cliq	Myntra	Ajio
Amazon	**0**	**1**	**1**	**1**	**1**	**1**	**1**
Flipkart	**1**	**0**	**1**	**1**	**1**	**1**	**1**
Meesho	**1**	**1**	**0**	**1**	**1**	**1**	**1**
snapdeals	**1**	**1**	**1**	**0**	**1**	**1**	**1**
Tatacliq	**1**	**1**	**1**	**1**	**0**	**1**	**0**
Myntra	**1**	**1**	**1**	**1**	**1**	**0**	**1**
Ajio	**1**	**1**	**1**	**1**	**0**	**1**	**0**

Table2:Correspondingmatrix

Observations:

1. Herepowerandrivalryholdloneamid7e-commercestage,inwhichAmazonis additionaldominator than the others.
2. Thisrivalrygridisa 2-dominatingrivalrygrid.

4. Conclusion:

It is impossible to escape dominance, because where nearby is dominance, there is rivalry. Also, a good environment enables us to recognize the best players in one industry. Long-term, the dominant ones come out on top. In any good area of life, the ruling competition graph hypothesis can be used to determine the dominant and dominated parties. There are some evident flaws in the overwhelming competition idea as well. When there are a lot of nodes and a lot of data, it is challenging to use this strategy.

When this occurs, it is exceedingly difficult to determine which nodes are most dominant among those that are competitive as well as how much rivalry exists between them.Furthermore, it might not always be possible to determine with accuracy which nodes are the most dominant. It can only provide a haphazard picture of the rival organizations and the dominant ones that will lead us in the proper direction. In terms of the hypothesis's potential, many types of digraphs can be used to test the idea of dominating the competition. This dominant competition hypothesis has applications in business, professions, academia, international politics, and other areas.

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