ALGORITHM AND IMPLEMENTATION OF DRAWING *K*-CONNECTED GRAPH WITH SMALL DIAMETER

A THESIS

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ABSTRACT

Computer network becomes important nowadays. The rapid changes of technology make the consequences for the computer networking to improve the quality itself. In communication between the computers there are many things that must be considered to, such as the number of the connection that connected to one station, and how far the data will be transferred.

In designing the network model there are some weakness that usually done by the designer, in case of the connectivity. In some topologies that already exist there are no specific attentions in the sense of connectivity and the minimum distance that can be treasure in the network.

To discuss more about how to model the network with the specific connection, it will be shown in a graph model. In the real world case, there are a lot of things that can be represented as a graph, and one of it is the network. Each station in the network will be represent as a dot (vertex) and the connection will be represent with a line (edge).

In this thesis, we give an algorithm that used to design a network connection between computers, with a specific connection and also the maximum of the minimum distance that possible in the network. To explore this algorithm, there are some theorems used in case to help in specifying the model of the network. We also give an implementation of the algorithm, as the testing model of the algorithm itself.

Keywords: algorithm, drawing network, graph theory, k-connected graph, diameter.

ABSTRAK

Saat ini jaringan computer merupakan satu hal yang sangat penting. Perkembangan teknologi yang cepat menyebabkan perkembangan bagi kualitas jaringan computer. Pada komunikasi antar komputer ada berbagai hal yang harus dipertimbangkan, seperti jumlah koneksi yang terhubung pada satu stasiun dan seberapa jauh data-data akan dikirim.

Dalam merancang bentuk jaringan ada beberapa kekurangan yang biasanya dilakukan oleh perancang, khususnya dalam hal konektifitas (keterhubungan). Pada beberapa topologi yang sudah ada, tidak ada ketertarikan khusus pada hal konektifitas dan pada jarak minimal yang dapat ditelusuri pada jaringan.

Untuk mendiskusikan lebih lanjut tentang bagaimana merancang suatu jaringan dengan koneksi tertentu, akan dibahas dengan menggunakan *graph*. Dalam kehidupan nyata, ada banyak hal yang dapat direpresentasikan sebagai *graph*, dan salah satunya adalah bentuk jaringan. Setiap stasiun pada jaringan akan direpresentasikan sebagai sebuah titik dan koneksinya akan direpresentasikan sebagai sebuah garis.

Pada tugas akhir ini, dibuat perancangan sebuah algoritma yang digunakan untuk merancang sebuah jaringan yang menghubungkan komputer-komputer, dengan jumlah koneksi tertentu dan juga nilai maksimal dari jarak minimal yang mungkin dari suatu jaringan. Untuk memahami algoritma ini, ada beberapa teori yang digunakan terutama dalam hal menspesifikasikan bentuk jaringan

Kata kunci: *algoritma, menggambar jaringan, teori graph, graph k-connected, diameter.*

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There will always a way for those who believe in GOD

Because in GOD everything is possible…..

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LIST OF SYMBOLS

●	Dot (vertex)…….	12
___	Line (edge)…….	12
$G = (V, E)$	Graph G with set of vertices V and set of edges E……	14
v_n	Vertex with index n ……..	15
K_n	Any complete graph with n vertices……..	16
$C_{n.}$	An n-vertex cycle graph…….	17
$A(G) = [a_{ij}]$	Adjacency matrix ……...	18
$\Theta(G)$	Diameter of graph G……	22
$\geq$ or >=	Bigger or equal than ……	23
>	Bigger than ……...	23
$d(G)$	Degree of a vertex in Graph ……..	23
$\#V$	Number of vertices…….	23
$\#E$	Number of edges…….	23
$\sum$	Sigma sign …….	22
$\in$	Element……	22
$\leq$ or <=	Less or equal than ……	26
<	Less than ……..	26
⌞⌟	Floor symbol…….	26