Different Types of Graph Used In Network Analysis

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Abstract: *In this paper different types of graphs are used to discuss network analysis. Each and every network system is represented by graph. A graph can be used to represent almost any physical situation involving discrete objects and a relationship among them. Graph is nothing but set of vertices and edges.*

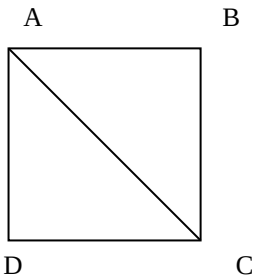
Keywords: *Graph, Network, Vertices, Edges, System.*

Introduction

Specific examples demonstrate that graph theory is a practical tool for solving network and distributed system problems. Graph theory has a very wide range of applications in engineering, in physical, social, and biological sciences. In real life, Electric System in building is the best example of graph in which different junction(such as bulbs ,tube light) represent vertices of the graph and wires connecting two junctions represent edges and whole system becomes a network of electrical system. An other example of graph is the road map in which different cities represent vertices and road connecting two cities represent edges of the graph and whole system becomes a network of different cities. In similar manner ,third example of graph is the family member in our home in which different people represent set of vertices and relationship between two people represent edges of the graph and whole system is referred as a family network. Let us consider some definitions related to graph with example.

Definition 1.1

Graph: A graph is defined as a pair of set G(V,E) where V is the set of all vertices and E is the set of all edges. Example:

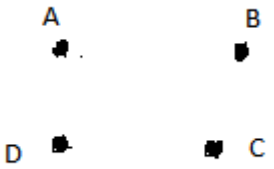


The number of vertices is 4 and the number of edges is 5.

Definition 1.2

Null Graph: A graph with no edges is called null graph.

Example:



Definition 1.3

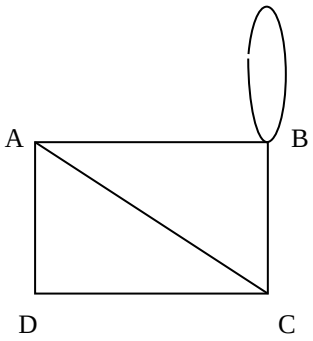
Trivial Graph: A null graph with only one vertex is called trivial graph.

Example:

Definition 1.4

Loop: An edge drawn from a vertex to itself is called a loop.

Example:

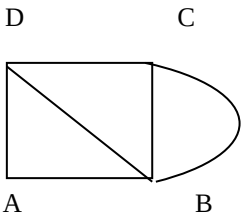


Loop at B

Definition 1.5

Parallel Edges: In graph if a pair of vertices are allowed to join by more than one edges, then those edges are called parallel edges.

Example:

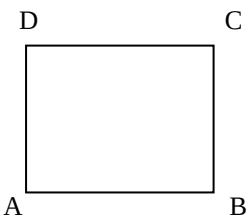


Parallel edges

Definition 1.6

Simple Graph : A graph with no parallel edges and no loop is called simple graph.

Example:

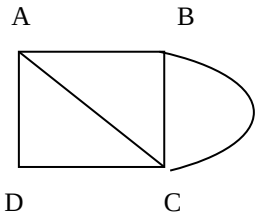


If graph is simple,then number of maximum edges with n vertices is given by n(n-1)/2.

Definition 1.7

Multi Graph: A graph with no loops but parallel edges is called multi graph .

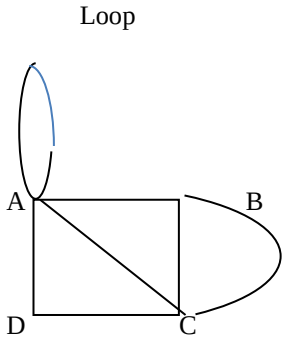
Example:



Definition 1.8

Pseudo Graph : A graph with loops and parallel edges is called Pseudo graph. Loop

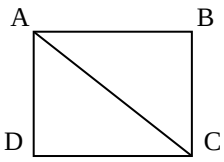
Example :



Definition 1.9

Degree of a vertex : It is the number of edges incident with vertex V and is denoted by D(V) or Deg(V).

Example :

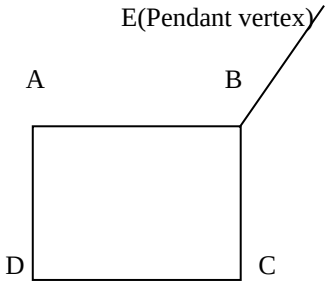


Deg(A)=3,Deg(B)=2,Deg(C)=3 and Deg(D)=2.

Definition 1.10

Pendant vertex : A vertex with degree 1 is called pendant vertex.

Example :



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