GRAPH THEORY PRESENTATION

Mathematics (582)

Central Department of mathematics.

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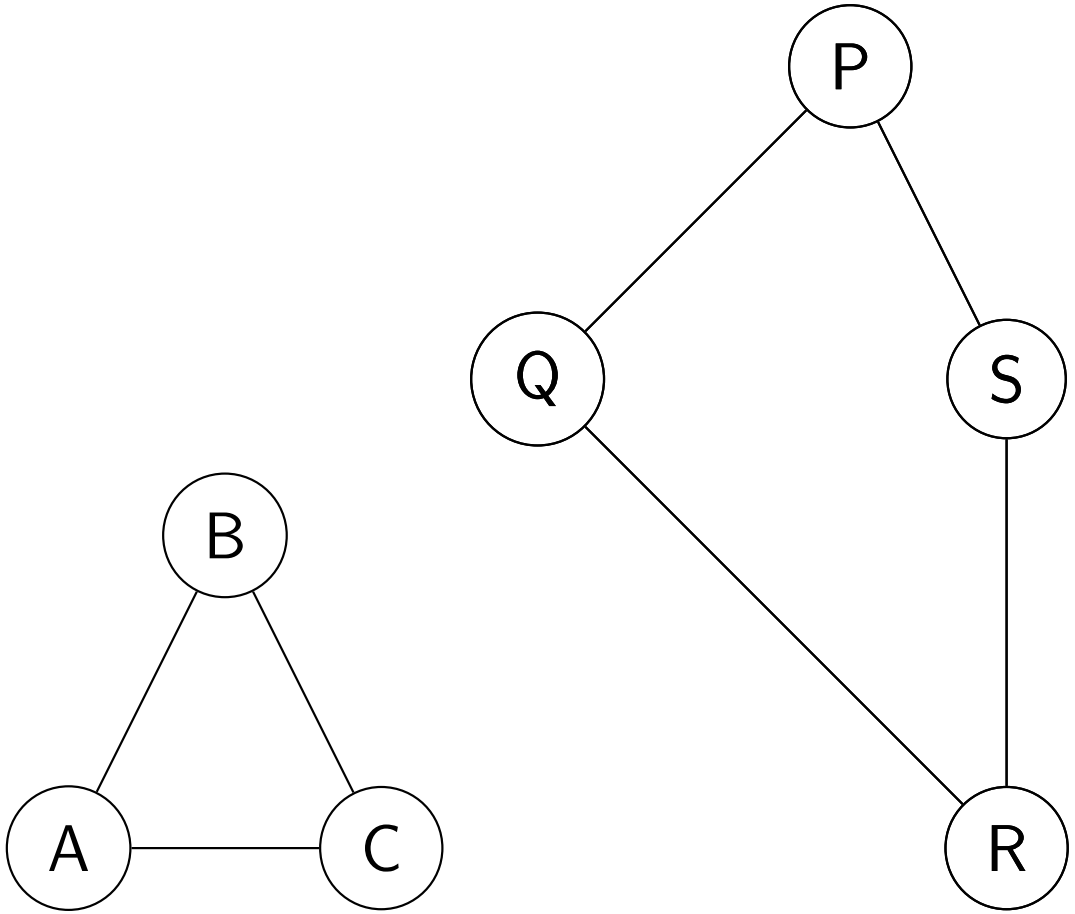
Contents

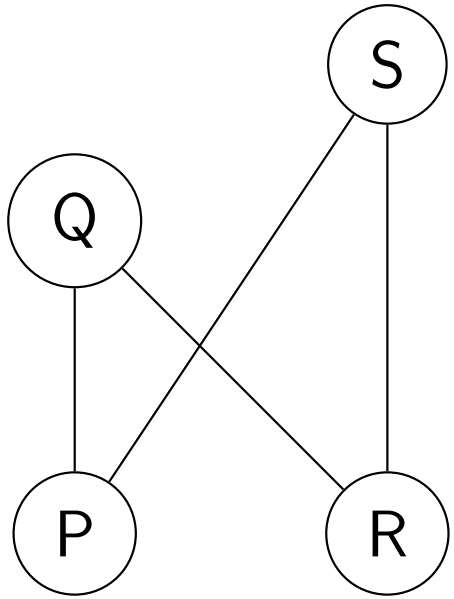
Graph

A graph is defined as G = (V , A). Where V is the set of vertices and A is the set of arcs.



Vertex

The set of vertices or node is denoted by V(D).



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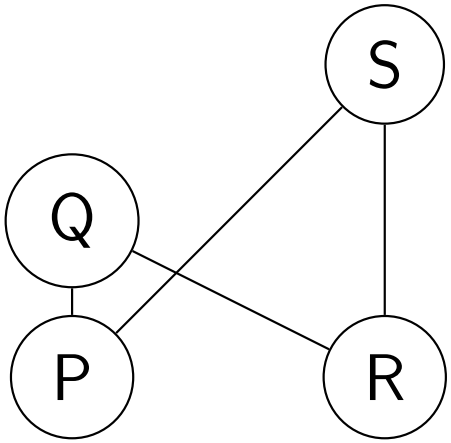
In above figure vertices are,

$V = \{P, Q, R, S\}$

Note:-Number of vertex are called degree of digraph.

Arcs

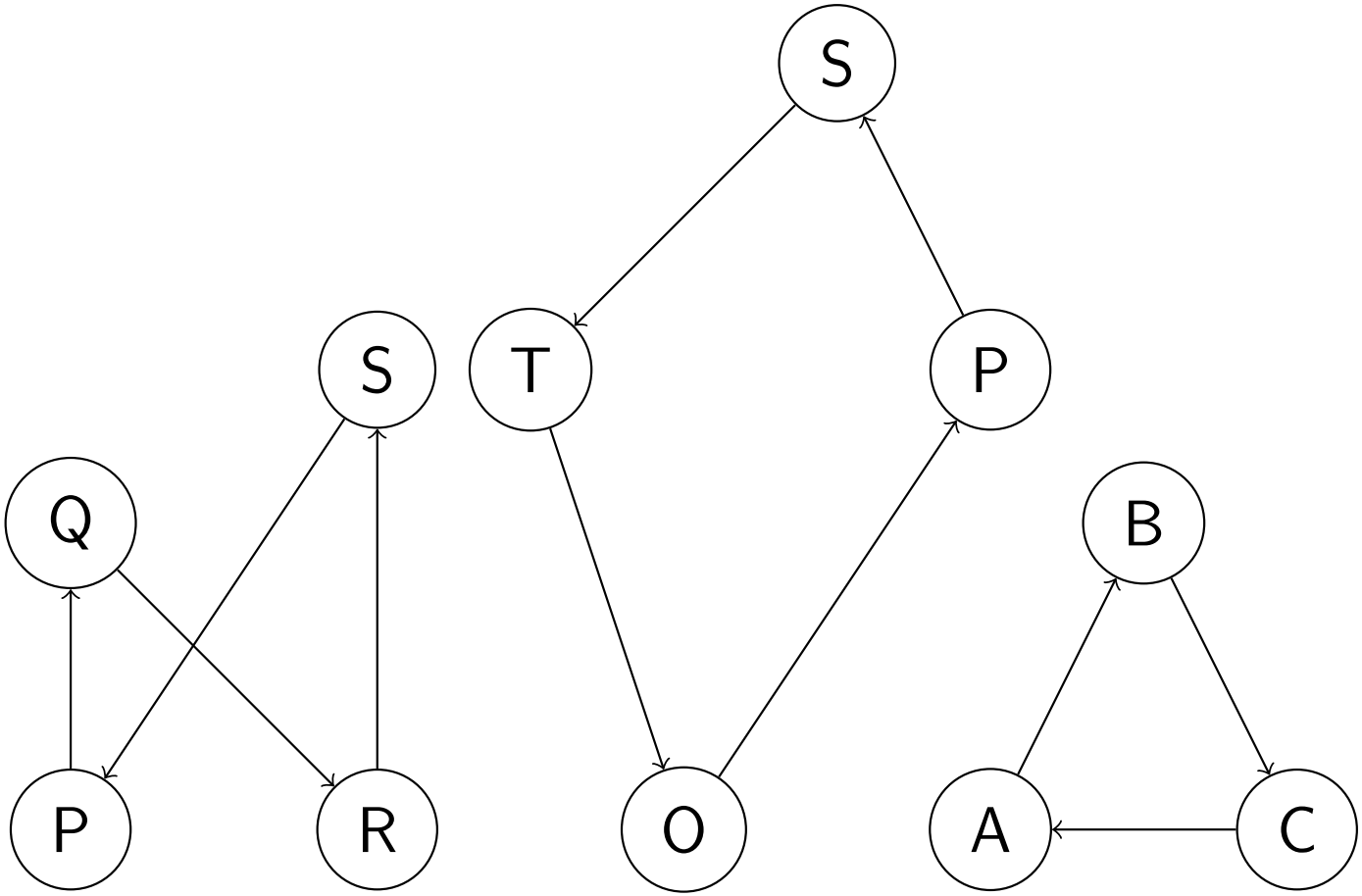
The set of arcs are denoted by A(D).



The arcs of above figure are,
A = {(P, Q),(P, S),(S, R),(R, S)}
Note: In above figure we can take any node as incident node as well as end node.
Note:-Number of arcs exists are called size of digraph.

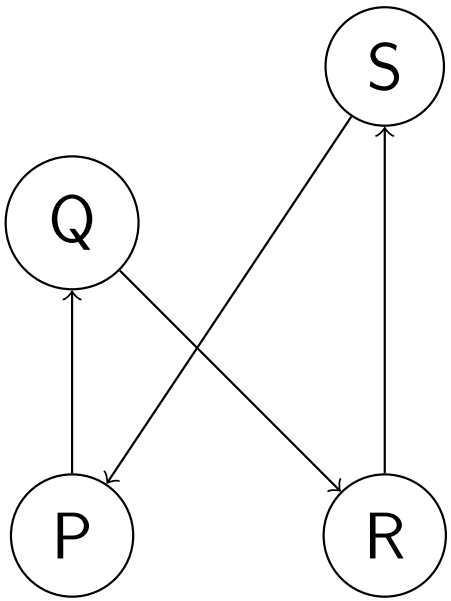
Directed graph

A graph is digraph if the arc(edge) are directed.



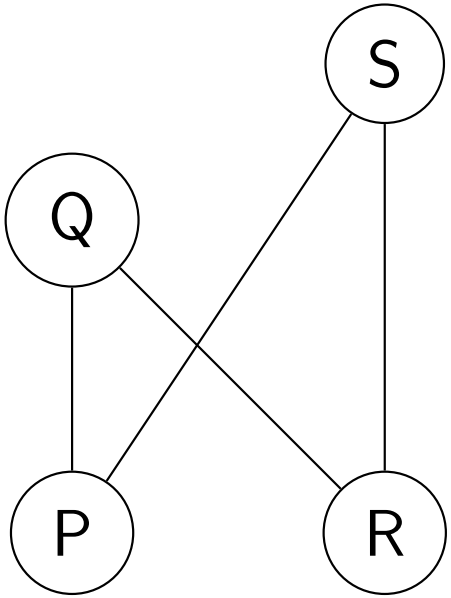
1. Tail.
2. Head.
3. End-nodes.
4. Adjacent arc.
5. Dominated vertex.

In figure PQRS tails are {P ,Q ,R ,S}and head are {Q ,R ,S ,P}.



Undirected Graph

If the arcs are not directed the graph is undirected graph.

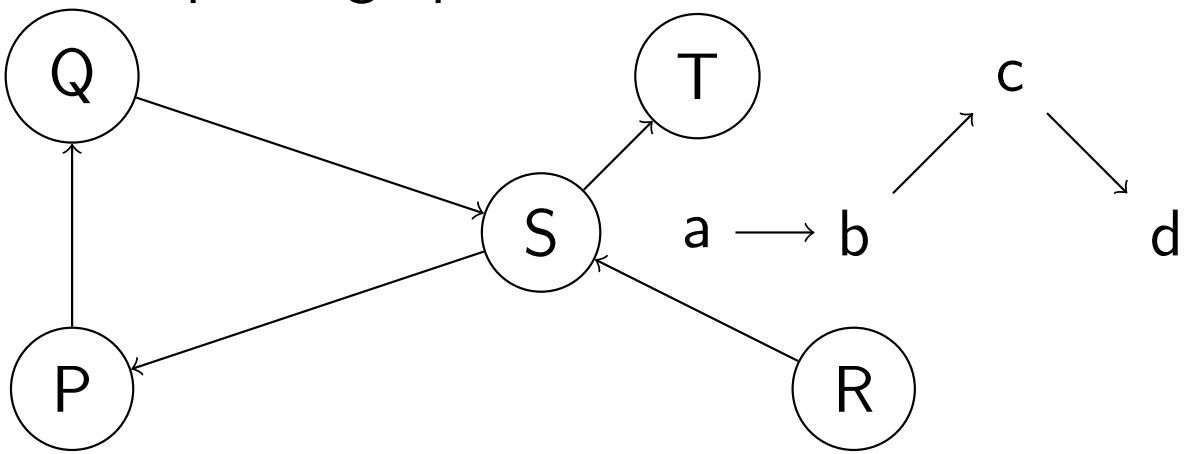


In above figure no arcs are directed from one vertex to another.

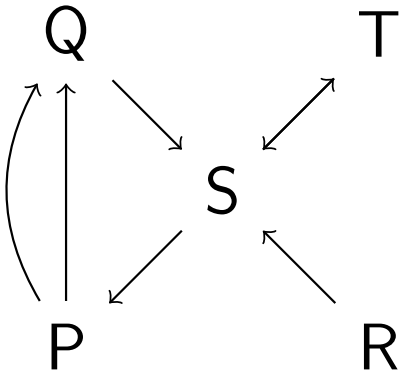
Types of Digraph

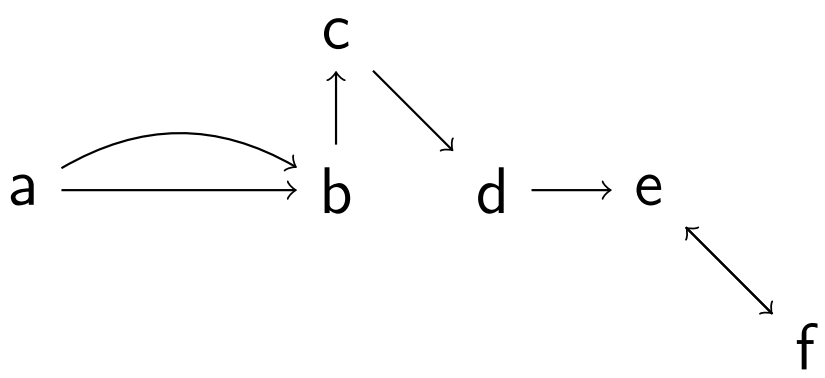
- Simple Digraph
- Parallel Digraph
- Multi Digraph
- Pseudo Digraph

1. Simple Digraph



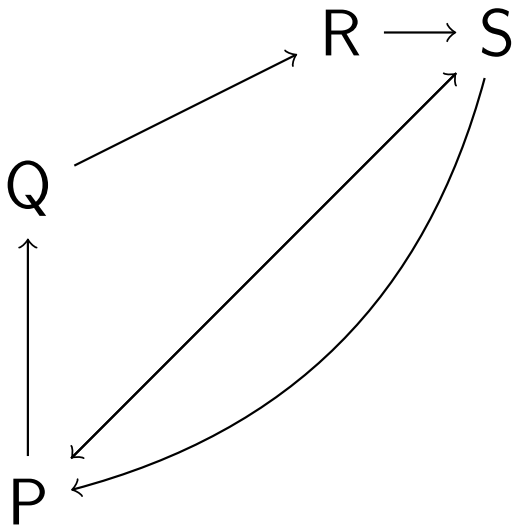
2. Parallel

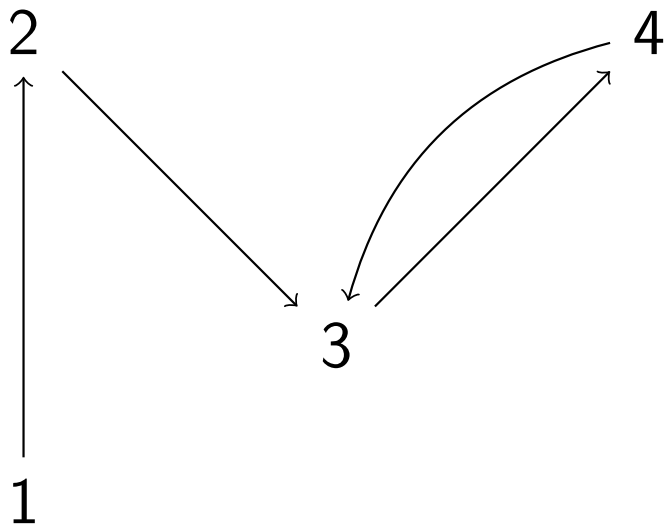




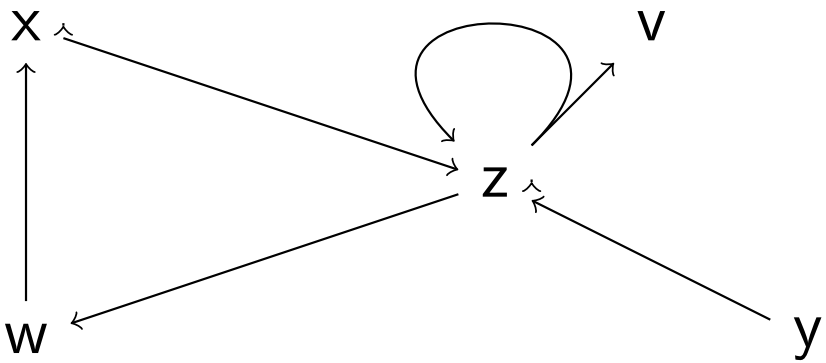
1. Loop.
2. Multiple arc.

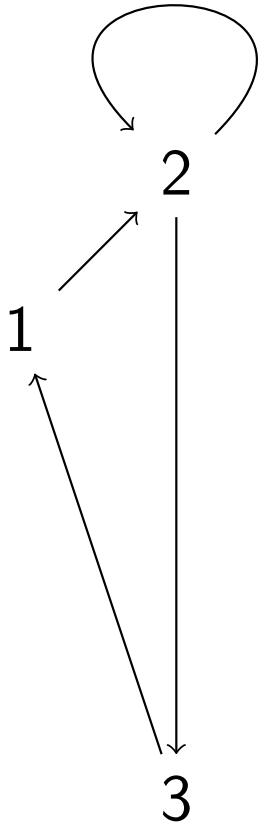
3. Multi Digraph





4. Pseudo Digraph.





1.Directed multi pseudograph.

Degree of Digraph

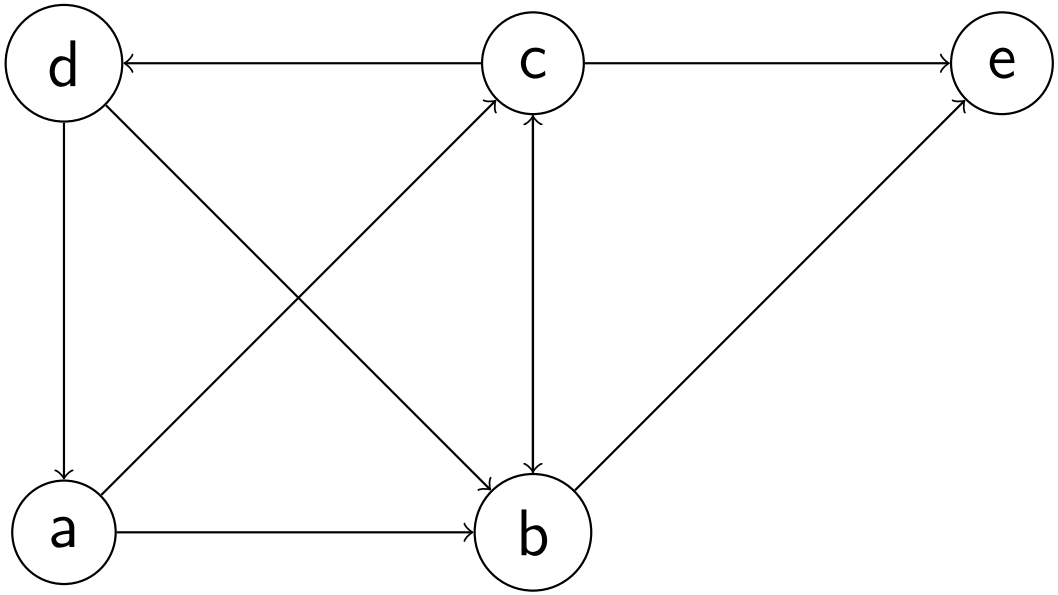
1. Out-Degree
2. In-Degree

Degree

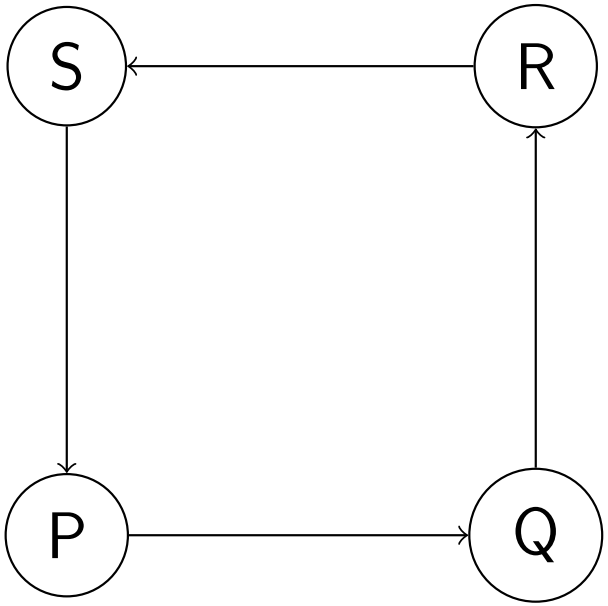
i. Minimum Simi-Degree

ii. Maximum Simi-Degree

iii. Regular Graph

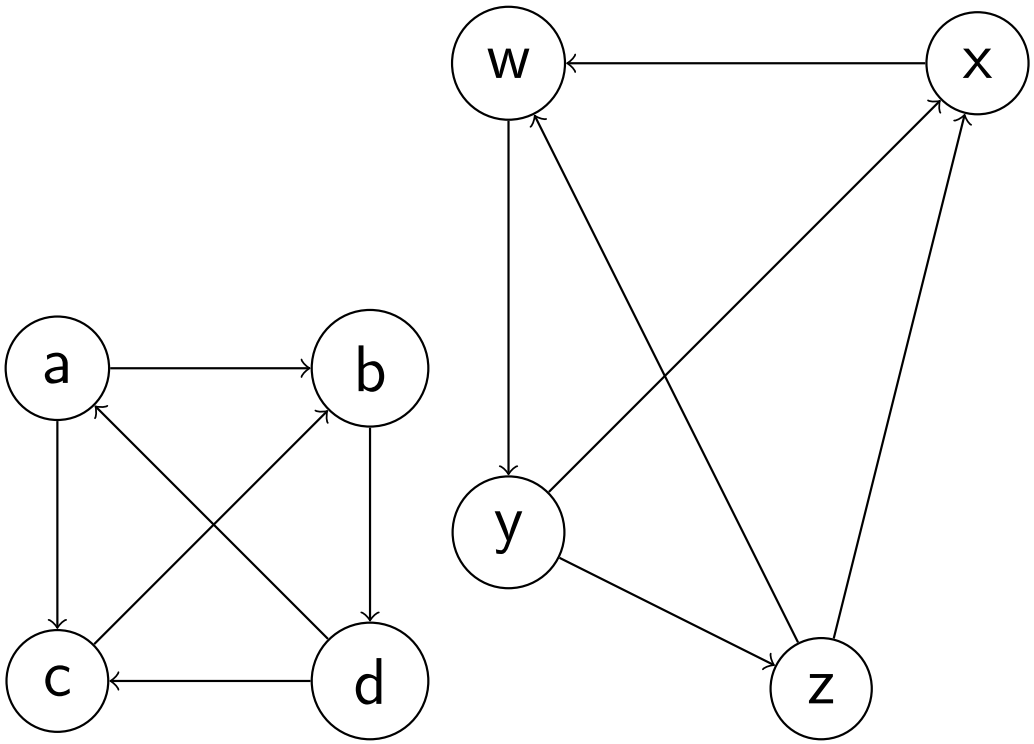


Regular Digraph



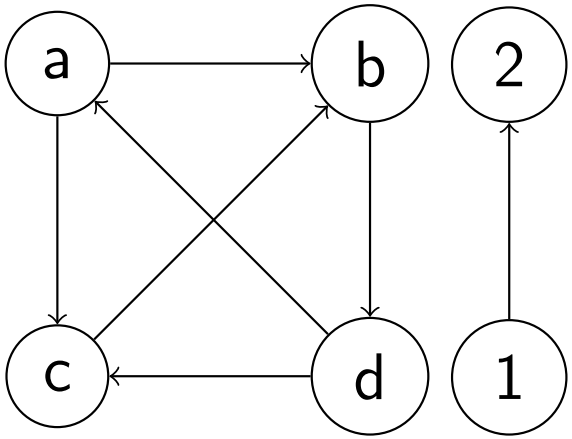
In above figure in-degree and out-degree are equal so it is example of regular digraph.

Isomorphism

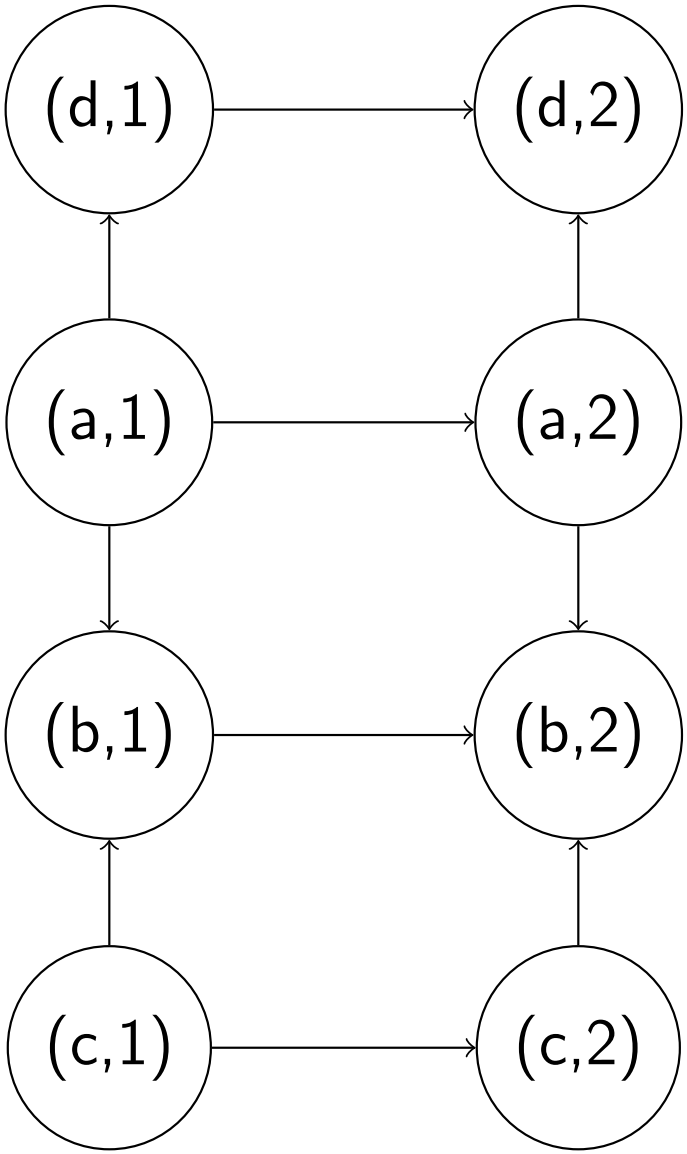


Cartesian Product

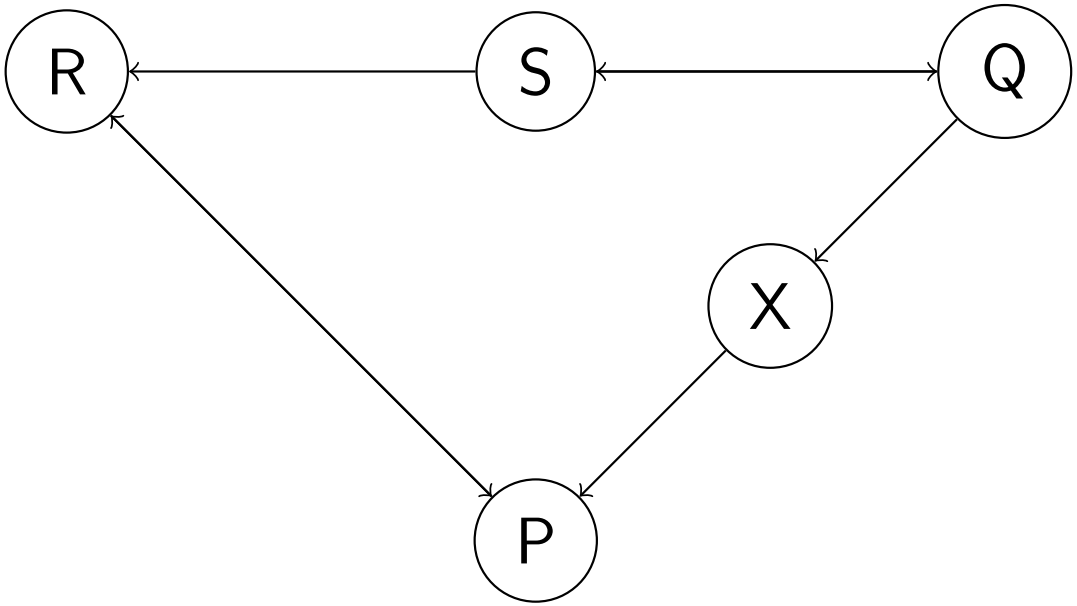
Following are two figures first (A) and second figure is (B)



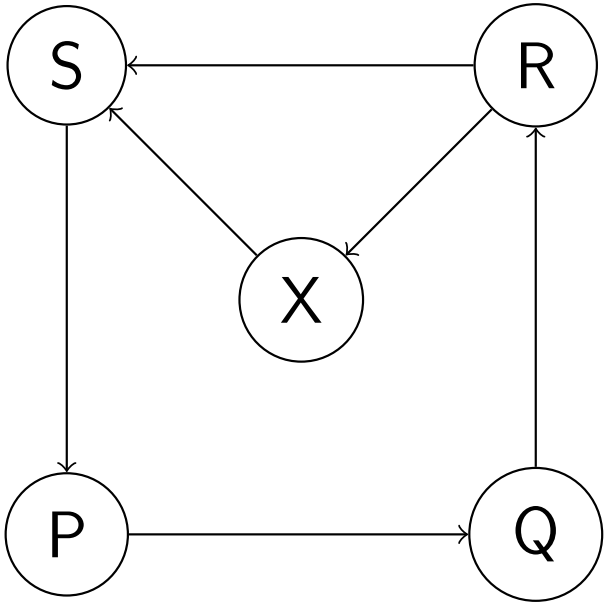
Cartesian Product of figure(A) and (B) are displayed below.



Power of Digraph

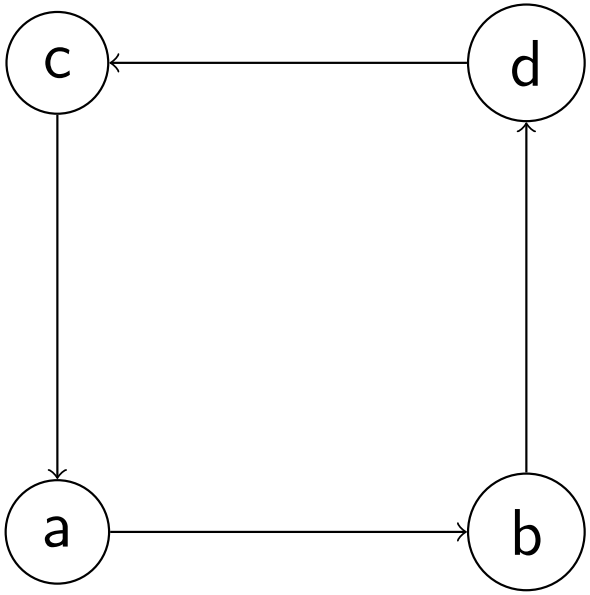


If we take p = 2 then we see following figure.

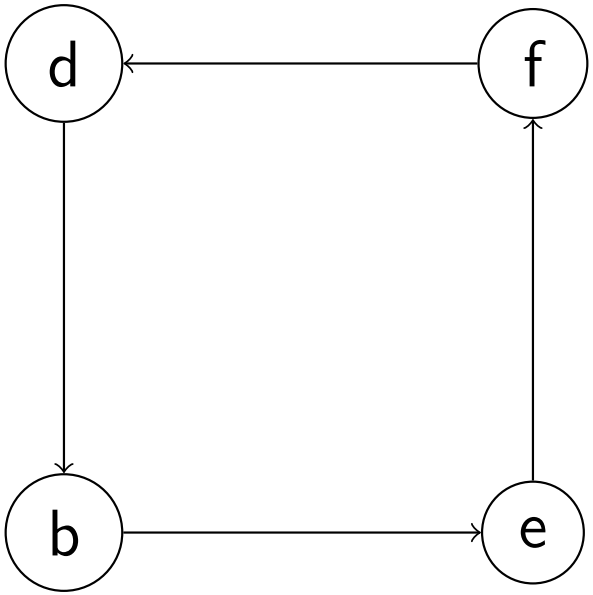


Union of Two Digraph

Digraph H,



Digraph L.



Union of H and L displayed below.