**Tree Graph**

A tree graph is a connected graph that does not have a simple cycle in it. It must also have 1 less edge than it does vertices.

A

B

C

D

E

F

G

H

This is a tree graph

It has 8 vertices and 7 edges

D

G

B

This is not a tree graph because ABECA form a simple cycle and it has as many edges as vertices

E

A

H

F

C

A

B

C

D

E

F

G

H

I

J

Can this graph be modified into a tree graph by removing some edges?

**Directed Graph**

A directed graph is a graph that has direction attached to its edges. An arrow on the edge identifies the direction of motion between two vertices.

A

B

C

D

E

F

G

Edge AB exists, however edge BA does not because of the flow of motion.

The distance between F and E is equal to 3 because the shortest chain connecting the two is FABE due to the flow of motion.

The distance between F and G does not exist because there is no chain connecting them. What is the distance between G and F?

**Weighted Graph**

A weighted graph is a graph where there are values associated with each edge.

The ***value*** or ***weight*** of a chain is equal to the sum of all the values in the chain.

A weighted graph can be directed or non directed.

The value of chain ABCD would be 10+18+12, which is 40.

10

18

23

22

12

13

A

B

C

D

E