# Graph Theory – Classifying Graphs

Name_____Per___

**Graph**: collection of vertices and edges

**Path from x to y:** list of vertices in which successive vertices are connected by edges: SB-MK-F1

**Simple Path**: a path in a graph which does not have repeating vertices (e.g. SpongeBob-Gary-Karen).

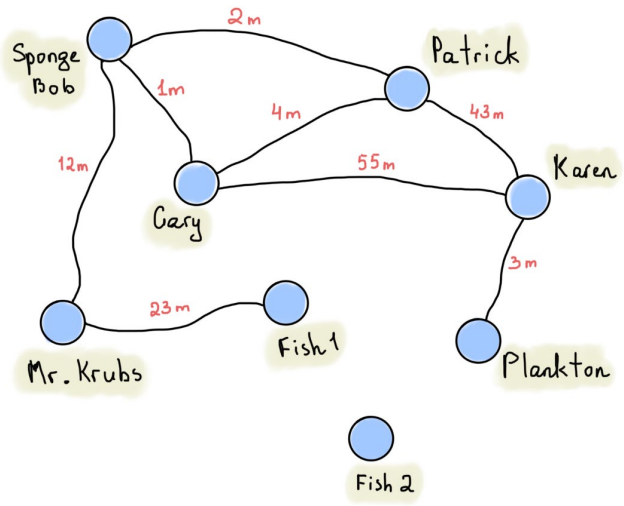
**Cycle**: a simple path of edges and vertices wherein a vertex is reachable from itself (e.g. Gary-Patrick-Karen-Gary).

**Simple Graph**: doesn't contain multiple edges between nodes nor loops. A **simple directed graph** has no multiple arrows with same source and target nodes

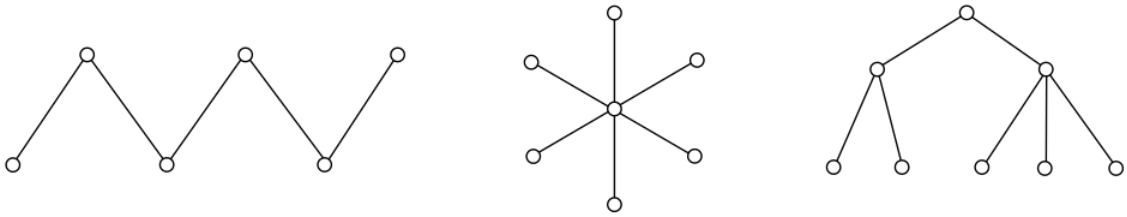
**Connected graph**: path exists from every vertex to every other vertex

**Unconnected graph**: a graph that is not connected and is made up of connected components

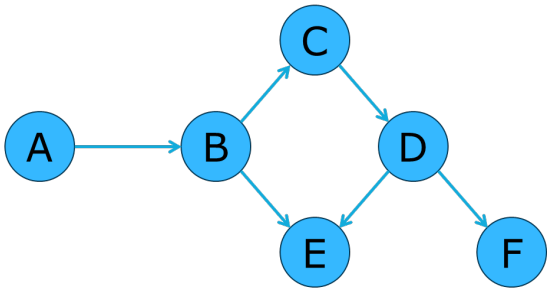
A simple undirected weighted cyclic graph:




**Tree:** An undirected graph in which any two vertices are connected by exactly one path.
I.e. a connected acyclic undirected graph. I.e. a connected graph that does not contain even a single cycle.

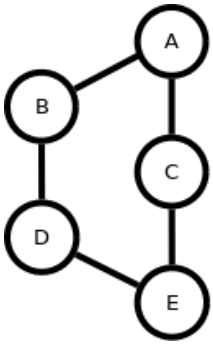


**Directed Acyclic Graph (DAG):**
a directed graph with no cycles

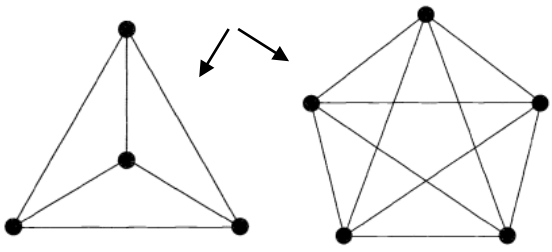



**Cyclic Graph**: A graph with at least one cycle.

**Circular Graph**: A graph that is a cycle.




**Complete Graph**: A simple graph in which each pair of distinct vertices are adjacent.



**Adjacency matrix:** matrix containing 1's and 0's indicating an existing directed edge between vertices.
1 = edge exists, 0 = edge does not exist