By Anando Zaman

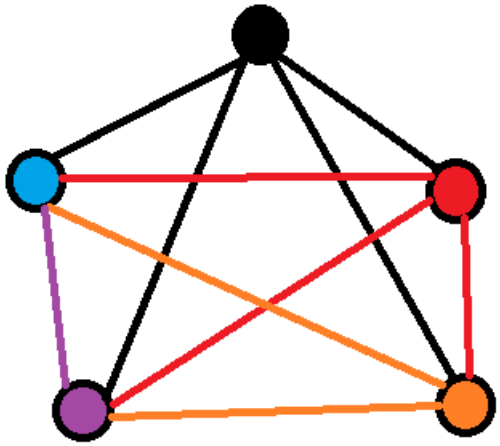
Exercise 4.1.1:: What is the maximum number of edges in a graph with V vertices and no parallel edges? What is the minimum number of edges in a graph with V vertices, none of which are isolated?

Solution:

Recall for V vertices, there are $(V-1)$ edges. 1st node connected to every node. 2nd node connected to every other node except first node, and so on. So start at $(V-1)$ nodes and adding or counting this gives total number of edges.

ie; $V \ + \ (V-1) \ + \ (V-2) \ + \ (V-3) \ + \ ... \ 1 \ + 0$

We can also represent it using the following equation: $\frac{(v-1)(v)}{2}$ where v is the total number of vertices in the graph.



5 vertex graph with total of 10 edges

Now in terms of minimum number of edges, we just create a graph as a single line like a linkedlist. So $(v-1)$ edges as min. Recall a tree is a connected graph with NO CYCLES. So tree of size n has $n-1$ edges