Max And Min Tasks Before Kth

Problem Explanation:

You are given some tasks with dependencies between them and a K. You have to find out two things about task K.

1. Minimum number of tasks that must be done so that you can start the task K
2. A maximum number of tasks that can be done if you don't do Kth task.

Prerequisites

Topological Sort
http://www.cs.utoronto.ca/~tabrown/csc263/2014W/week9.pdf

Approach

For the first task, we need to find how many tasks K is dependent directly or indirectly. This number is the answer to the first task.

For the second task if we find out how many tasks are dependent on the Kth task directly or indirectly then we can get the solution for the second task using this value. Let this number be `x`. Then the answer to the second task will be **n - x.**

If you can see we need two kinds of graphs. For the first task, we need a directed graph such that there is an edge from a dependent task to the task it is dependent on. Let this graph be G1.

For the second task, we need a directed graph, such that there is an edge from a task u → v such that task `v` is dependent on the task `u`. Let this graph be G2.

Now to calculate the no of tasks we will do DFS from task K for graph G1 and G2.

DFS using G1 will give all the tasks K is dependent on.
DFS using G2 will give all the tasks which are dependent on K.