**Question :** Write a java code which will take a file as input (which contains activity matrix) and gives us the start time, completion time for each activity. Also find the Critical path for the given test case.

**Note**:-

1. Input and output format must be same as given example.

2.Relevant algorithms are given below:

**a) *ALGORITHM FOR COMPLETION TIME***

1. *For each node, do step 1.1 (until completion times of all nodes are calculated)*
   1. *If the predecessors are completed, then take the latest completions  
      time of the predecessors and add required time for this node.*
2. *The node with the latest completion time determines the earliest completion time for project.*

***b) ALGORITHM FOR MARKING CRITICAL PATH***

1. *Start with the node(s) with the latest completion time(s); mark it (them) as  
   critical.*
2. *Select the predecessor(s) of the critical node(s) with latest completion  
   time(s); mark it (them) as critical. Continue Step 2 until reaching the  
   starting node(s).*

**Example:** **Input:-**

|  |  |  |
| --- | --- | --- |
| **Activity** | **Intermediate predecessor** | **Duration (in weeks)** |
| A | - | 9 |
| B | A | 4 |
| C | A | 3 |
| D | B, C | 7 |
| E | D | 6 |
| F | E | 1 |
| G | D | 8 |
| H | F, G | 5 |
|  |  |  |

**Output:-**

|  |  |  |  |
| --- | --- | --- | --- |
| **Activity** | **Start Time** | **Completion Time** | **Critical Path** |
| A | 0 | 9 | \* |
| B | 9 | 13 | \* |
| C | 9 | 12 |  |
| D | 13 | 20 | \* |
| E | 20 | 26 |  |
| F | 26 | 27 |  |
| G | 20 | 28 | \* |
| H | 28 | 33 | \* |
|  |  |  |  |

The critical path is **A->B->D->G ->H.**