

## Documentation – Practical work no. 4

1.

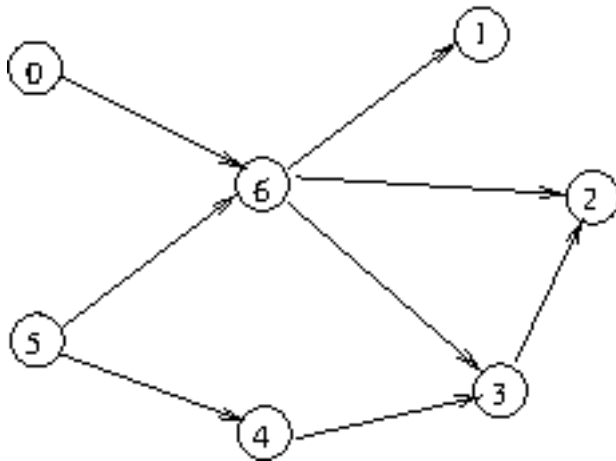
Activity	Time	Prerequisites
0	1	-
5	2	-
6	5	0, 5
4	1	5
1	2	6
3	2	4, 6
2	1	3, 6

TopoSort:

sortedGraph = []

fullyProcessed = {}

isProcess = {}



x = 0

sorted = [0]

fullyProcessed = {0}

x = 1

inProcess = {1}

y = 6

inProcess = {1, 6}

y = 0

y = 5

inProcess = {1, 6, 5}

sorted = [0, 5]

sorted = [0, 5, 6]

sorted = [0, 5, 6, 1]

fullyProcessed = {0, 1, 5, 6}

inProcess = {2}

y = 6

y = 3

inProcess = {2, 3}

y = 4

inProcess = {2, 3, 4}

sorted = [0, 5, 6, 1, 4]  
 sorted = [0, 5, 6, 1, 4, 3]  
 sorted = [0, 5, 6, 1, 4, 3, 2]

$tm(X) = t^*m(X) = 0$   
 $tm(0) = \max \{t^*m(X)\} = 0$   
 $t^*m(0) = tm(0) + 1 = 1$   
 $tm(5) = \max \{t^*m(X)\} = 0$   
 $t^*m(5) = tm(5) + 2 = 2$   
 $tm(6) = \max \{t^*m(5), t^*m(0)\} = 2$   
 $t^*m(6) = tm(6) + 5 = 7$   
 $tm(1) = \max \{t^*m(6)\} = 7$   
 $t^*m(1) = tm(1) + 2 = 9$   
 $tm(4) = \max \{t^*m(5)\} = 2$   
 $t^*m(4) = tm(4) + 1 = 3$   
 $tm(3) = \max \{t^*m(6), t^*m(4)\} = 7$   
 $t^*m(3) = tm(3) + 2 = 9$   
 $tm(2) = \max \{t^*m(3), t^*m(6)\} = 9$   
 $t^*m(2) = tm(2) + 1 = 10$   
 $tm(Y) = \max \{t^*m(1), t^*m(2)\} = 10 = t^*m(Y)$

$tM(Y) = t^*M(Y) = t^*m(Y) = tm(Y) = 10$   
 $t^*M(2) = \min \{tM(Y)\} = 10$   
 $tM(2) = t^*M(2) - 1 = 9$   
 $t^*M(3) = \min \{tM(2)\} = 9$   
 $tM(3) = 9 - 2 = 7$   
 $t^*M(4) = \min \{tM(3)\} = 7$   
 $tM(4) = t^*M(4) - 1 = 6$   
 $t^*M(1) = \min \{tM(Y)\} = 10$   
 $tM(1) = t^*M(1) - 2 = 8$   
 $t^*M(6) = \min \{tM(1), tM(2), tM(3)\} = 7$   
 $tM(6) = t^*M(6) - 5 = 2$   
 $t^*M(5) = \min \{tM(6), tM(4)\} = 2$   
 $tM(5) = t^*M(5) - 2 = 0$   
 $t^*M(0) = \min \{tM(6)\} = 2$   
 $tM(0) = t^*M(0) - 1 = 1$

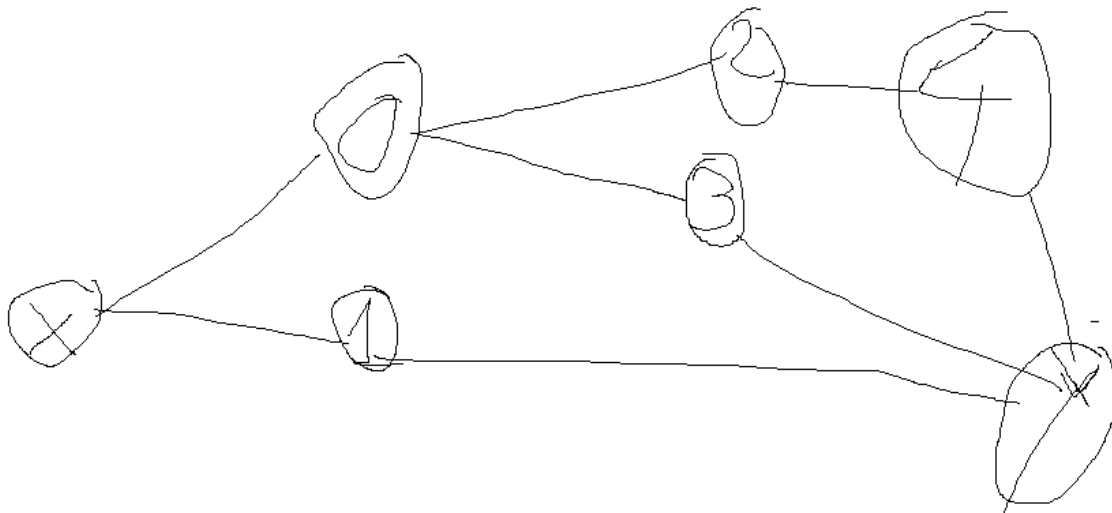
Earliest Starting Point	Vertex	Latest Starting Point
0	0	1
7	1	8
<b>9</b>	<b>2</b>	<b>9</b>
<b>7</b>	<b>3</b>	<b>7</b>
2	4	6
<b>0</b>	<b>5</b>	<b>0</b>
<b>2</b>	<b>6</b>	<b>2</b>

Total time:  $tM(Y) = 10$

Critical activities: 2, 3, 5, 6

2.

Activity	Time	Prerequisites
0	2	-
1	5	-
2	3	0
3	3	0
4	2	2



TopoSort:

sorted = []

fullyProcessed = {}

inProcess = {}

inProcess = {0}

sorted = [0]

inProcess = {1}

sorted = [0, 1]

inProcess = {2}

y = 0

sorted = [0, 1, 2]

inProcess = 3

y = 0

sorted = [0, 1, 2, 3]

inProcess = {4}

y = 2

sorted = [0, 1, 2, 3, 4]

$$\begin{aligned}
tm(X) &= t^*m(X) = 0 \\
tm(0) &= \max\{t^*m(X)\} = 0 \\
t^*m(0) &= tm(0) + 2 = 2 \\
tm(1) &= \max\{t^*m(X)\} = 0 \\
t^*m(1) &= tm(1) + 5 = 5 \\
tm(2) &= \max\{t^*m(0)\} = 2 \\
t^*m(2) &= tm(2) + 3 = 5 \\
tm(3) &= \max\{t^*m(0)\} = 2 \\
t^*m(3) &= tm(3) + 3 = 5 \\
tm(4) &= \max\{t^*m(2)\} = 5 \\
t^*m(4) &= tm(4) + 2 = 7 \\
tm(Y) &= \max\{t^*m(1), t^*m(3), t^*m(4)\} = 7 = t^*m(Y)
\end{aligned}$$

$$\begin{aligned}
tM(Y) &= t^*M(Y) = tm(Y) = t^*m(Y) = 7 \\
t^*M(4) &= \min\{tM(Y)\} = 7 \\
tM(4) &= t^*M(4) - 2 = 5 \\
t^*M(3) &= \min\{tM(Y)\} = 7 \\
tM(3) &= t^*M(3) - 3 = 4 \\
t^*M(2) &= \min\{tM(4)\} = 5 \\
tM(2) &= t^*M(2) - 3 = 2 \\
t^*M(1) &= \min\{tM(Y)\} = 7 \\
tM(1) &= t^*M(1) - 5 = 2 \\
t^*M(0) &= \min\{tM(2), tM(3)\} = 2 \\
tM(0) &= t^*M(0) - 2 = 0
\end{aligned}$$

Earliest Starting Point	Vertex	Latest Starting Point
<b>0</b>	<b>0</b>	<b>0</b>
0	1	2
<b>2</b>	<b>2</b>	<b>2</b>
2	3	4
<b>5</b>	<b>4</b>	<b>5</b>

Total time:  $tM(Y) = 7$   
Critical activities: 0, 2, 4