Worksheet 15 (Scheduling 1): Priority Lists and Decreasing Time Algorithm

Group Names: _____

1. The following tasks need to be completed for a project.

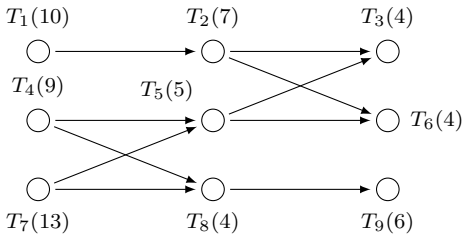
Task	Time Required	Prerequisites
A	3 hours	
B	2 hours	
C	1 hour	
D	2 hours	A, B
E	2 hours	A, B
F	8 hours	C
G	1 hours	D, E, F

   (a) To the left of the chart, draw a digraph to represent this project.

   (b) If there is only one processor, how long will it take to complete the project? _____

   (c) The critical time can be determined by looking at the longest sequence of tasks in the digraph, called the critical path.
   What is the critical path for this project? _____
   What is the critical time? _____

2. Consider the following digraph:

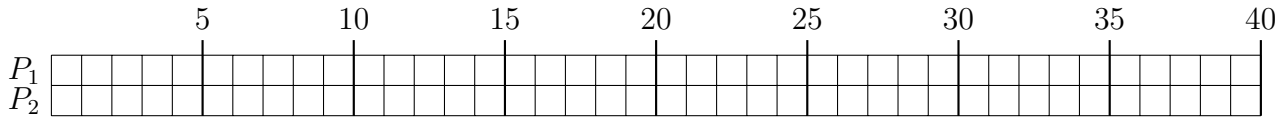


time	ready	done

   (a) Create a schedule using the priority list

$$T_1, T_2, T_3, T_4, T_5, T_6, T_7, T_8, T_9$$

   assuming you have only two processors.

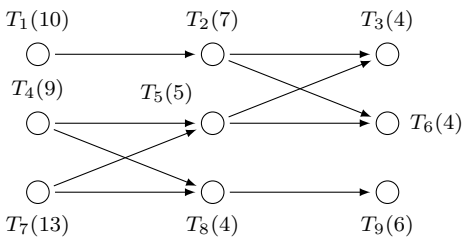


   (b) How much idle time does processor 1 have? _____
   How much idle time does processor 2 have? _____

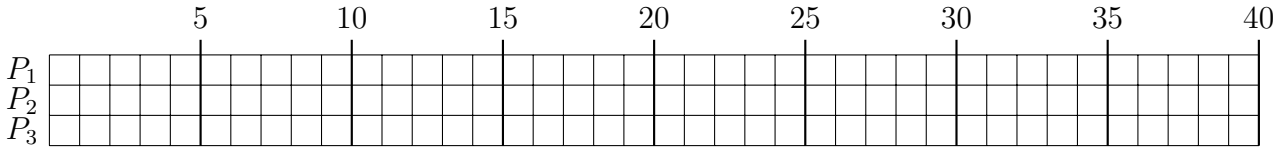
(c) Here's the digraph again. Create a schedule using the same priority list

$$T_1, T_2, T_3, T_4, T_5, T_6, T_7, T_8, T_9$$

assuming you have three processors.



time	ready	done

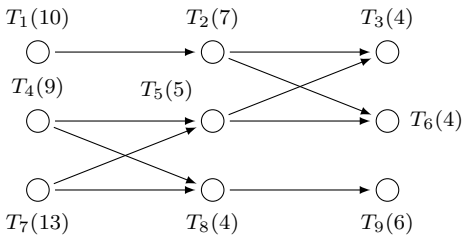


(d) How does the time to completion compare with using two processors?

How does the idle time compare?

(e) What is the critical path for this digraph? _____
Have you found an optimal schedule? How do you know?

(f) The Decreasing Time Algorithm says: Create the priority list by listing the tasks in order from longest completion time to shortest completion time.

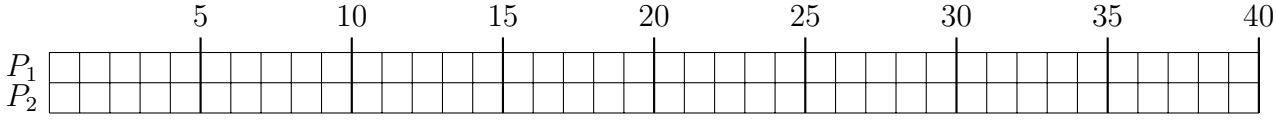


time	ready	done

What priority list do you get if you prioritize the tasks using the Decreasing Time Algorithm?

_____

(g) Create a schedule using the priority list you just found using the Decreasing Time Algorithm, assuming you have only two processors. How long does it take? _____



How does it compare to your previous schedule?