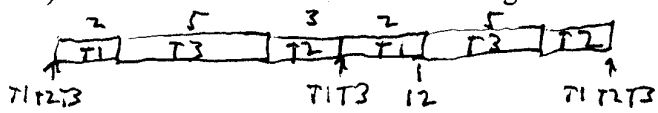
Assignment 9

The following tasks are scheduled by the ukernel scheduler task (units are clock ticks):

Task	execution time	period	deadline
T1	2	10	4
T2	6	20	12
T3	5	10	10.

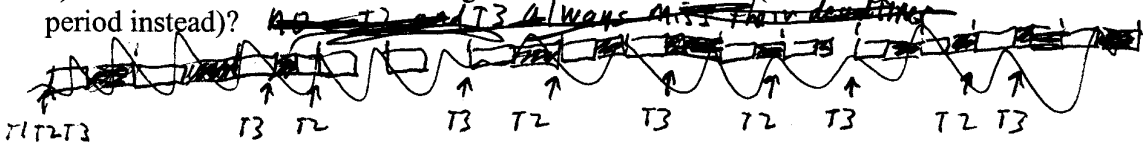
For questions 1-2, show a Gantt chart for first major schedule period as your proof.

1)Does Deadline-Monotonic scheduling work for these 3 tasks?



NO, T2 did not get a chance to finish by its deadline of 12

2)Does Rate-Monotonic scheduling work for these 3 tasks (assuming the deadline is the period instead)?



yes it work

T1
T3
then T2
spaces

T1 T2 T3 Gantt cha is s

3)Is there a scheduling algorithm that exists which allows the scheduler task itself to be running on the same processor as these 3 tasks and meet all deadlines? Prove this point by calculating the total processor utilization for the above 3 tasks.

no

$2/10 + 6/20 + 5/10 = 100\%$ already - no room for scheduler task

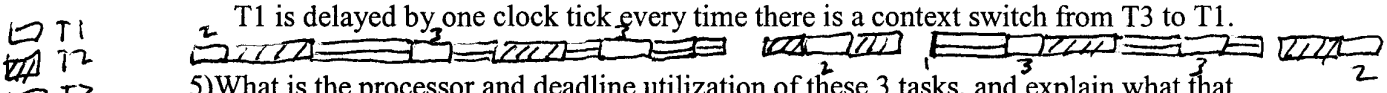
4)Using fixed utilization priority scheduling, prove without the Gantt chart why the above 3 tasks will not be schedulable with this algorithm.

T1 will have lowest priority so that it will miss its deadline since it has the shortest deadline

For Question 5, the following tasks are scheduled by the ukernel scheduler task (units are clock ticks):

Task	execution time	period	deadline
T1	2	10	10
T2	4	14	14
T3	10	35	35

T1 is delayed by one clock tick every time there is a context switch from T3 to T1.



5)What is the processor and deadline utilization of these 3 tasks, and explain what that means for Rate-Monotonic scheduling or Deadline-Monotonic scheduling, respectively?

in 1 major period T1's exe time is 2 3 times out of 7, and is 3 4 times out of 7 =>

$U_p = 4/14 + 10/35 + \frac{(2\cdot 3 + 3\cdot 4)/7}{10}$

$= .83$

but $3(2^{1/3} - 1) = .77$ so $1 > .83 > .77$ (R-M sch may wor

but $.83 < 1$ (D-M schedu will work