Homework #3 — Zhansultanov Aygn

#3.5

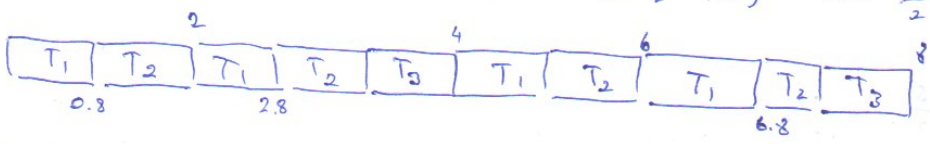
```
for (;;) { taskA();
           task_B();
           task_C();
           task_D();
           task_A();
           task_B();
           task_C();
           task_A();
           task_A(); }
```

#3.13

The main difference between EDF and RM schedulling methods is that they are best suited for different cases. EDF is dynamic, that is why it shows best performance in unpredictable environment, while RM is static, so it is best suited for periodic environment. It is also fair to say that RM schedulling is less flexible, however best choice for critical and dangerous processes. Because in RM we can guarantee that processes with lower periods will have higher priority. Vice versa, in times when overload occurs EDF runs tasks which is not important at the moment, and doesn't run highly important tasks, so we can't control EDF.

#2.16

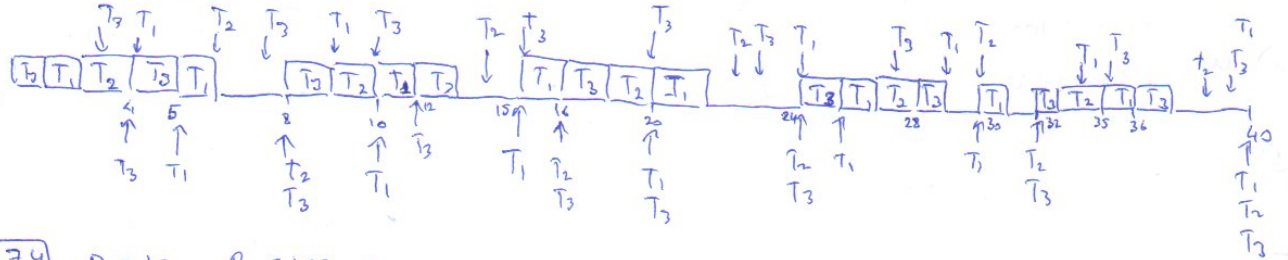
$T_1 = [0.8 ; 2]$ $T_2 = \{1.4; 4\}$ $T_3 = \{2; 8\}$ $U = \frac{0.8}{2} + \frac{1.4}{4} + \frac{2}{8} = 100\%$



#3.18

$T_1 = \{1; 5; 4\}$ $T_2 = \{2; 8; 6\}$ $T_3 = \{1; 4; 3\}$

$U = \frac{1}{5} + \frac{2}{8} + \frac{1}{4} = 0.7 < 1$ => EDF is feasible



#7.4 $P_1 = 10$ $P_2 = 100$ $P_3 = 500$ $P_4 = 1000$
$e_1 = 2$ $e_2 = 15$ $e_3 = 100$ $e_4 = 10$

$P_{min} = x \rightarrow \frac{2}{x} + \frac{15}{100} + \frac{100}{500} + \frac{10}{1000} \leq 0.91$

$x \geq 3.64$ ms

#7.5 $f = \{25, 50\}$ $b = \{100, -\}$ $O = 0.1ms$

$50x \geq 25x + 100 + (2x-1)0.1$

$24.8x \geq 99.9$

$x \geq [4.03]$

$x \geq 5$ $x = 5$ Turnaround Time $= 5 \times 25 + 100 + 9 \times 0.1 = 225.9 ms$

#7.7

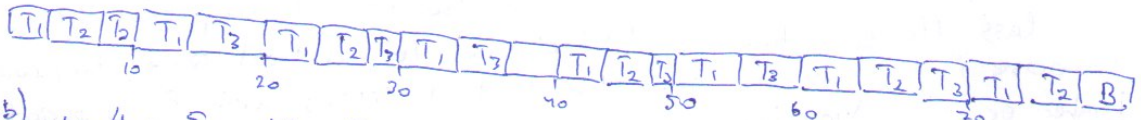
$W = 40ms \Rightarrow$ time to complete all three tasks:

$4 \cdot 4 + 2 \times 5 + 1 \times 10 = 36$.

$40 - 36 = 4$ left for background, but 5 is needed, therefor $H = 80$.

Given priorities makes impossible the schedulling. Taking to assumption that there is typo. And changing priorities of 2nd and 3rd.

a) Schedulling is feasible.

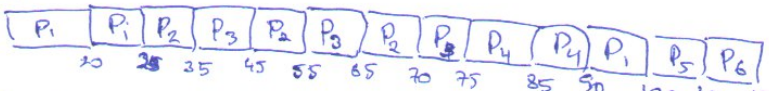


b) $U = \frac{4}{10} + \frac{5}{20} + \frac{10}{40} + \frac{5}{80} = 0.96$

c) if we will add 21ms of context switches, $H = 80$ ms is not enough, that is why we need $H = 120$.

d) $H = 120$ $U \geq \frac{4}{10} + \frac{5}{20} + \frac{10}{40} + \frac{5}{120} + \frac{21}{120} \simeq 1,12\% > 100\%$

#5.8

a) 

b) $T_1 = 20$ $T_2 = 70 - 25 = 45$ $T_3 = 75 - 30 = 45$ $T_4 = 90 - 60 = 30$ $T_5 = 110 - 100 = 10$

$T_6 = 120 - 105 = 15$

c) $W_1 = 20 - 20 = 0$ $W_2 = 45 - 25 = 20$ $W_3 = 45 - 25 = 20$ $W_4 = 30 - 15 = 15$

$W_5 = 10 - 10 = 0$ $W_6 = 15 - 10 = 5$

d) $U = 100 - \frac{5+10}{120} = 87.5\%$

#5.12

a) $q = 1ms$ $O = 0.1ms$ $U = \frac{q}{q+O} = \frac{1}{1,1} = 91\%$

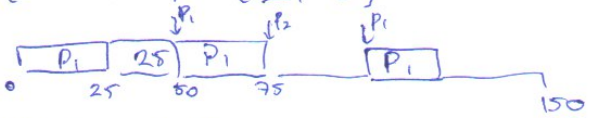
b) $q = 10ms$ $O = 0.1ms$ $I/Ot = 1ms$ $CPUt = 10ms$

$U = \frac{10+10}{10.1,1 + 10.1} = \frac{20}{21,1} \simeq 94\%$

#5.22

$P_1 = \{25, 50\}$ $P_2 = \{30, 75\}$ $H = 150$

a)



RM is not feasible 25 ms is not enough for P_2.

b) $\frac{25}{100} + \frac{30}{75} = 83.3\% < 100\%$ EDF is feasible