Q2. T1(4,1) T2(5,1) T3(10,1)

Total Utilization $= \frac{1}{4} + \frac{1}{5} + \frac{1}{10} = 0.55$

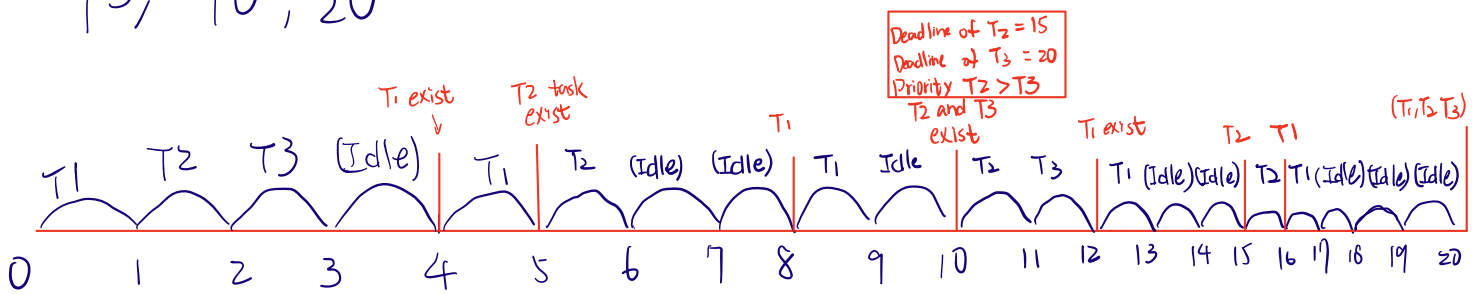
Since $0.55 \leq 1$, this task set is schedulable in EDF algorithm

Period time :

T1 : 4, 8, 12, 16, 20

T2 : 5, 10, 15, 20

T3, 10, 20



Q3.

3.1) T1(2,5) T2(2,7) T3(3,10)

$U = \frac{2}{5} + \frac{2}{7} + \frac{3}{10} = 0.9857$

$0.9857 \leq 1 \Rightarrow$ schedulable under EDF

U_{bound} of RM $\Rightarrow 3(2^{1/3}-1) \approx 0.779$

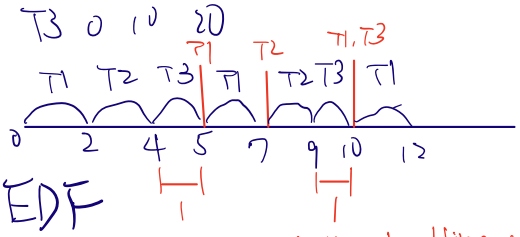
$0.9857 > 0.779$, the task set doesn't satisfy the RM utilization bound.

RM Fail :

T1 0 5 10 15 20

T2 0 7 14 21

T3 0 10 20



T3 missed the deadline : 0
it only process 2 < 3 before 10.

3.2) $f_{original} = 800\,MHz$ $C_i^{new} = C_i \cdot \frac{f_{original}}{f_{new}}$

To achieve $U \leq 0.779$, we need: $\frac{C_1^{new}}{P_1} + \frac{C_2^{new}}{P_2} + \frac{C_3^{new}}{P_3} \leq 0.779$ Substitute $C_i^{new} = C_i \cdot \frac{800}{f_{new}}$

$\Rightarrow \frac{1600}{5 f_{new}} + \frac{1600}{7 f_{new}} + \frac{1600}{10 f_{new}} \leq 0.779$ $\frac{788.57}{f_{new}} \leq 0.779$ $f \geq 1012.3$ ✗

CPU should run at clock frequency $\geq 1012.3\,MHz$

Q4. T1(15,3) T2(13,5) T3(14,4) T4(16,2) T5(20,4) T6(22,3)

T1 → T3, T4 T2 → T3, T5 T3 → T4, T5 T4 → T6 T5 → T6