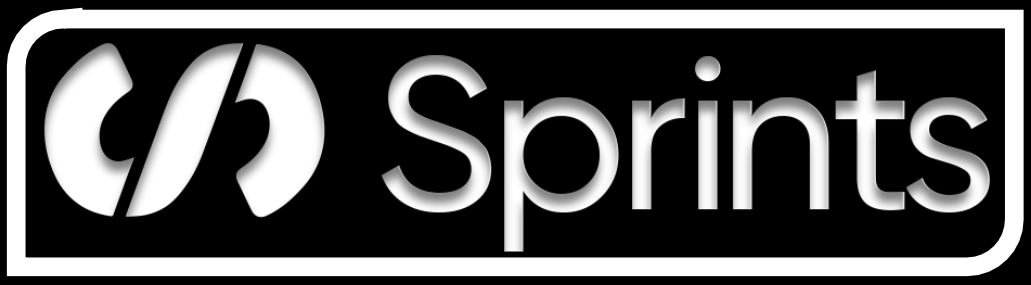

Schedule Analytical Method

Task

Bassel Yasser Mahmoud

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Sprints

Contents

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Tasks

T1{P:5, E:2.5, D:5}, **T2**{P:15, E:4.5, D:15}, **T3**{P:20, E:3.5, D:20}

URM Calculation

$$U=\sum_{i=1}^{n}\frac{C_i}{P_i} \leq n(2^{\frac{1}{n}}-1)$$

$$U=\frac{2.5}{5}+\frac{4.5}{15}+\frac{3.5}{20}=0.975$$

$$Urm=3\left(2^{\frac{1}{3}}-1\right)=0.779$$

U > Urm → System **Not Schedulable** and needs more tests

Time demand Calculation

$$w(t)=e_i + \sum_{k=1}^{i-1} \left\lceil \frac{t}{p_k} \right\rceil e_k \quad for\ 0 < t \leq p_i$$

Task1

w(1) = 2.5 + 0 = 2.5

w(2) = 2.5 + 0 = 2.5

w(3) = 2.5 + 0 = 2.5

w(4) = 2.5 + 0 = 2.5

w(5) = 2.5 + 0 = 2.5

w(5) < 5 , T1 is **schedulable**

Task2

$$w(8) = 4.5 + \left\lceil \frac{8}{5} \right\rceil * 2.5 = 9.5$$

$$w(9) = 4.5 + \left\lceil \frac{9}{5} \right\rceil * 2.5 = 9.5$$

$$w(10) = 4.5 + \left\lceil \frac{10}{5} \right\rceil * 2.5 = 9.5$$

$$w(11) = 4.5 + \left\lceil \frac{11}{5} \right\rceil * 2.5 = 12$$

$$w(12) = 4.5 + \left\lceil \frac{12}{5} \right\rceil * 2.5 = 12$$

$$w(15) = 4.5 + \left\lceil \frac{15}{5} \right\rceil * 2.5 = 12$$

w(15) < 15 , T2 is **schedulable**

Task3

$$w(10) = 3.5 + \left\lceil \frac{10}{15} \right\rceil * 4.5 + \left\lceil \frac{10}{5} \right\rceil * 2.5 = 13$$

$$w(15) = 3.5 + \left\lceil \frac{15}{15} \right\rceil * 4.5 + \left\lceil \frac{15}{5} \right\rceil * 2.5 = 15.5$$

$$w(17) = 3.5 + \left\lceil \frac{17}{15} \right\rceil * 4.5 + \left\lceil \frac{17}{5} \right\rceil * 2.5 = 22.5$$

$$w(18) = 3.5 + \left\lceil \frac{18}{15} \right\rceil * 4.5 + \left\lceil \frac{18}{5} \right\rceil * 2.5 = 22.5$$

$$w(20) = 3.5 + \left\lceil \frac{20}{15} \right\rceil * 4.5 + \left\lceil \frac{20}{5} \right\rceil * 2.5 = 22.5$$

w(20) > 20 , T3 is not **schedulable**

NB : After we made URM calculation and Time demand calculation on this task , we noticed that the two calculations leading to the same result that the system is not schedulable

Simulation on SimSo

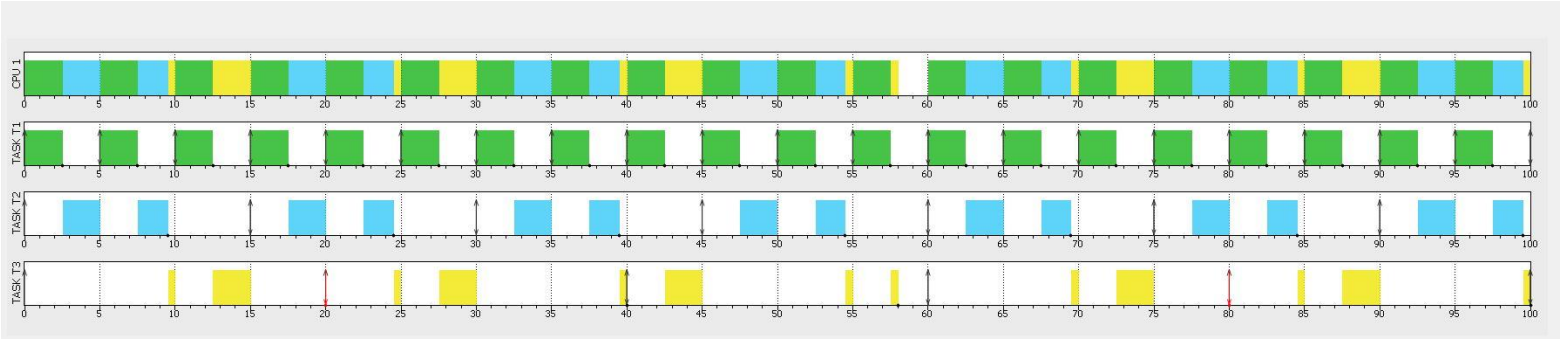

Figure 1: Tasks timeline

As we saw in **Figure1** or **Figure2** that the task3, exceeds and miss its deadline, this means that our calculations are true that the system is not schedulable, and indeed task3 miss its deadline based on time demand calculation.

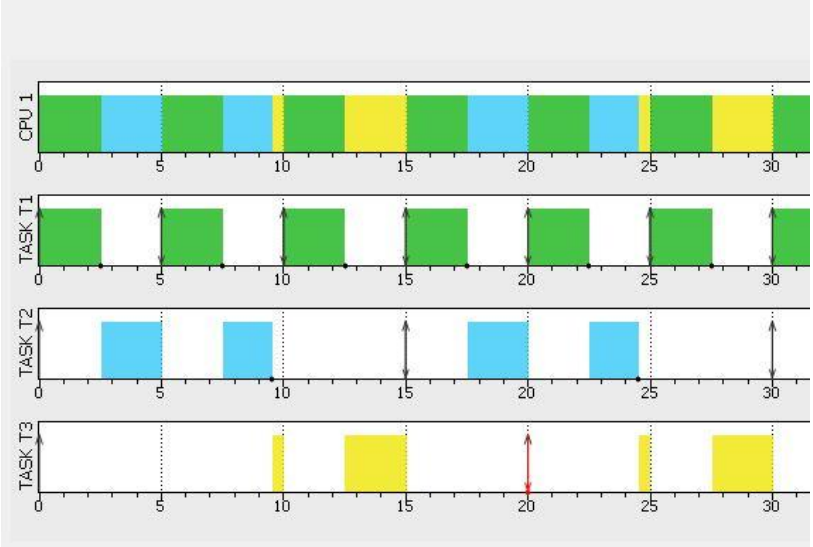

Figure 2: Zoomed Tasks timeline

Our CPU load on this system is about 98% as it shown in **figure3**

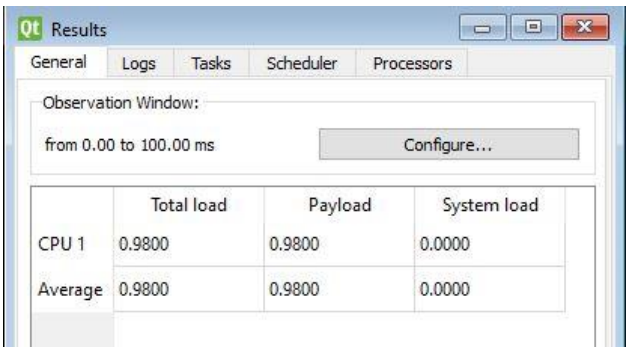

Figure 3: CPU load