

# Report

## Scheduler Task

### Task1:

**Periodicity:** 5 msec.

**Execution time:** 2.5 msec.

**Deadline:** 5 msec.

### Task2:

**Periodicity:** 15 msec.

**Execution time:** 4.5 msec.

**Deadline:** 15 msec.

### Task3:

**Periodicity:** 20 msec.

**Execution time:** 3.5 msec.

**Deadline:** 20 msec.

## 1- Rate monotonic utilization bound test:

$$U = (2.5/5) + (4.5/15) + (4.5/15) = .975$$

$$URM = 3*((2^{(1/3)})-1) = .778$$

So, the U is larger than URM we guaranteed that the system is not schedulable.

## 2- Time demand analysis:

- We will arrange the tasks according to their priorities to T1 T2 T3.

- **T1 demand Time:**

$$W1(1) = 2.5 + 0 = 2.5$$

$$W1(2) = 2.5 + 0 = 2.5$$

$$W1(3) = 2.5 + 0 = 2.5$$

$$W1(4) = 2.5 + 0 = 2.5$$

$$W1(5) = 2.5 + 0 = 2.5$$

the demand time( $W1(5) = 2.5$ ) is **shorter** than the provided time( $D=5$ )  
so, we guaranteed that T1 is schedulable.

- **T2 demand Time:**

- $W2(1) = 4.5 + (1/5) * 2.5 = 7$

- $W2(2) = 4.5 + (2/5) * 2.5 = 7$

- $W2(3) = 4.5 + (3/5) * 2.5 = 7$

- $W2(4) = 4.5 + (4/5) * 2.5 = 7$

- $W2(5) = 4.5 + (5/5) * 2.5 = 7$

- $W2(6) = 4.5 + (6/5) * 2.5 = 9.5$

- $W2(7) = 4.5 + (7/5) * 2.5 = 9.5$

- $W2(8) = 4.5 + (8/5) * 2.5 = 9.5$

- $W2(9) = 4.5 + (9/5) * 2.5 = 9.5$

- $W2(10) = 4.5 + (10/5) * 2.5 = 12$
- $W2(11) = 4.5 + (11/5) * 2.5 = 12$
- $W2(12) = 4.5 + (12/5) * 2.5 = 12$
- $W2(13) = 4.5 + (13/5) * 2.5 = 12$
- $W2(14) = 4.5 + (14/5) * 2.5 = 12$
- $W2(15) = 4.5 + (15/5) * 2.5 = 12$

the demand time( $W2(15) = 12$ ) is **shorter** than the provided time( $D=15$ )

so, we guaranteed that T2 is schedulable.

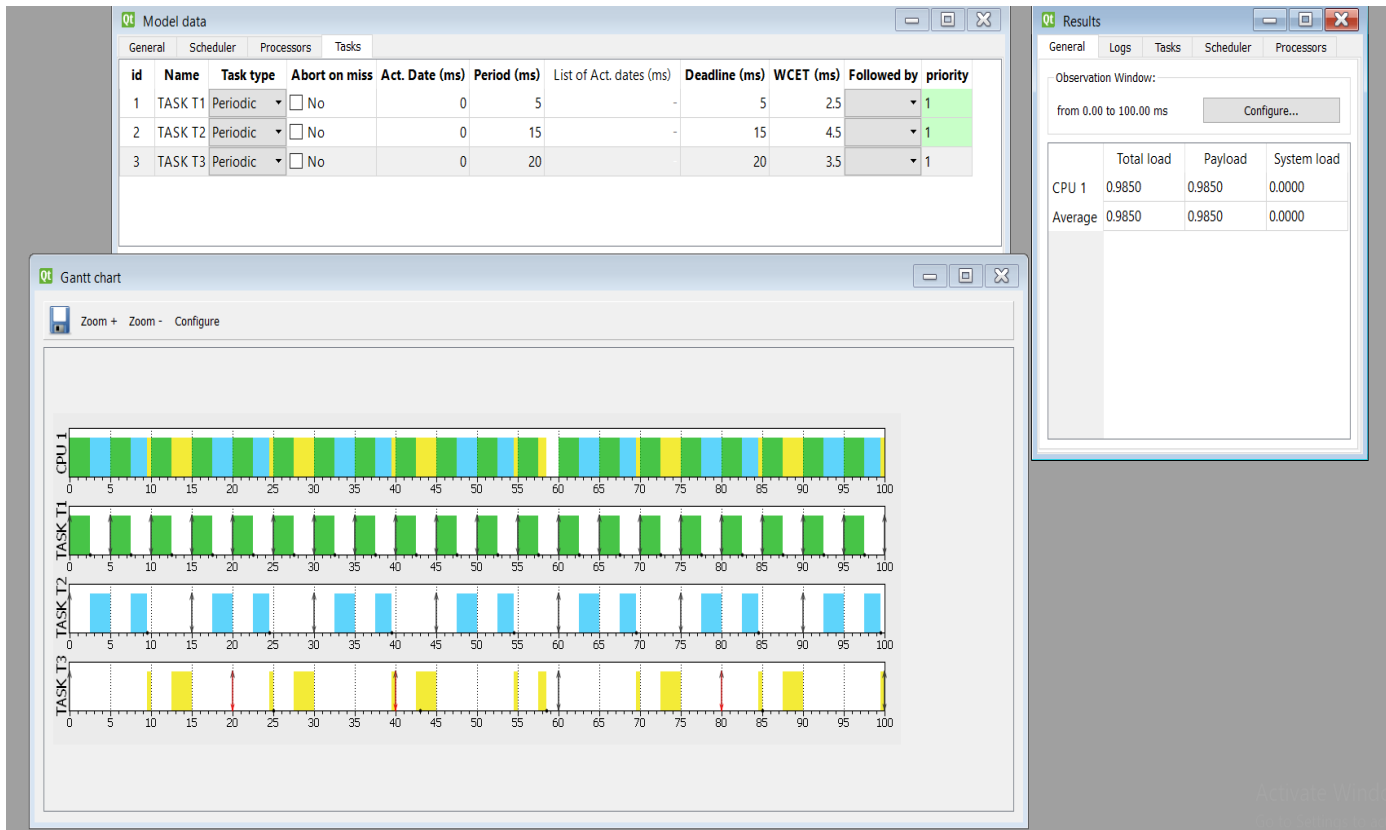
- **T3 demand Time:**

- $W3(1) = 3.5 + (1/5) * 2.5 + (1/15) * 4.5 = 10.5$
- $W3(2) = 3.5 + (2/5) * 2.5 + (2/15) * 4.5 = 10.5$
- $W3(3) = 3.5 + (3/5) * 2.5 + (3/15) * 4.5 = 10.5$
- $W3(4) = 3.5 + (4/5) * 2.5 + (4/15) * 4.5 = 10.5$
- $W3(5) = 3.5 + (5/5) * 2.5 + (5/15) * 4.5 = 10.5$
- $W3(6) = 3.5 + (6/5) * 2.5 + (6/15) * 4.5 = 12$
- $W3(7) = 3.5 + (7/5) * 2.5 + (7/15) * 4.5 = 12$
- $W3(8) = 3.5 + (8/5) * 2.5 + (8/15) * 4.5 = 12$
- $W3(9) = 3.5 + (9/5) * 2.5 + (9/15) * 4.5 = 12$
- $W3(10) = 3.5 + (10/5) * 2.5 + (10/15) * 4.5 = 12$
- $W3(11) = 3.5 + (11/5) * 2.5 + (11/15) * 4.5 = 15.5$
- $W3(12) = 3.5 + (12/5) * 2.5 + (12/15) * 4.5 = 15.5$
- $W3(13) = 3.5 + (13/5) * 2.5 + (13/15) * 4.5 = 15.5$
- $W3(14) = 3.5 + (14/5) * 2.5 + (14/15) * 4.5 = 15.5$
- $W3(15) = 3.5 + (15/5) * 2.5 + (15/15) * 4.5 = 15.5$
- $W3(16) = 3.5 + (16/5) * 2.5 + (16/15) * 4.5 = 22.5$
- $W3(17) = 3.5 + (17/5) * 2.5 + (17/15) * 4.5 = 22.5$
- $W3(18) = 3.5 + (18/5) * 2.5 + (18/15) * 4.5 = 22.5$
- $W3(19) = 3.5 + (19/5) * 2.5 + (19/15) * 4.5 = 22.5$
- $W3(20) = 3.5 + (20/5) * 2.5 + (20/15) * 4.5 = 22.5$

the demand time( $W3(20) = 22.5$ ) is **longer** than the provided time( $D=20$ )  
so, we guaranteed that T3 is not schedulable.

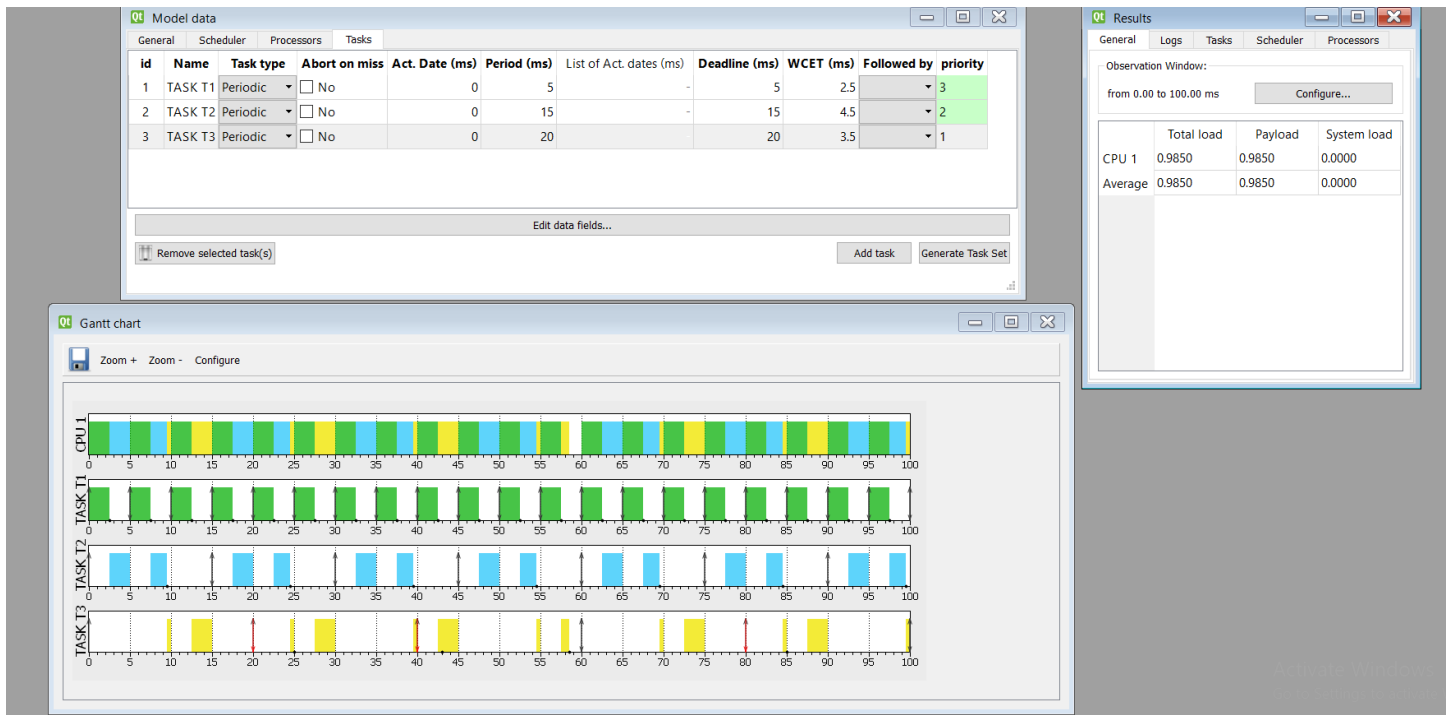
## Simulation on Simso:

### 1-Rate monotonic scheduler:



System is high loaded and task 3 miss the deadline  
So, the system is not schedulable.

## 2-Time demand (fixed priority scheduler)



System is high loaded and task 3 miss the deadline  
So, the system is not schedulable.

Thank you.

