# SSY191 IA3

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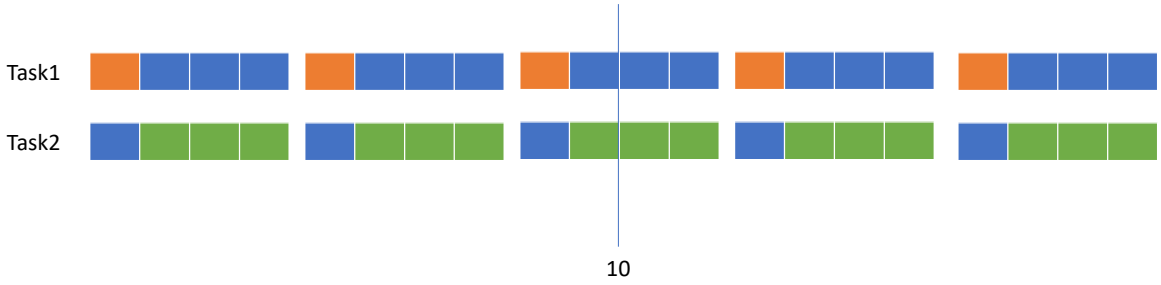
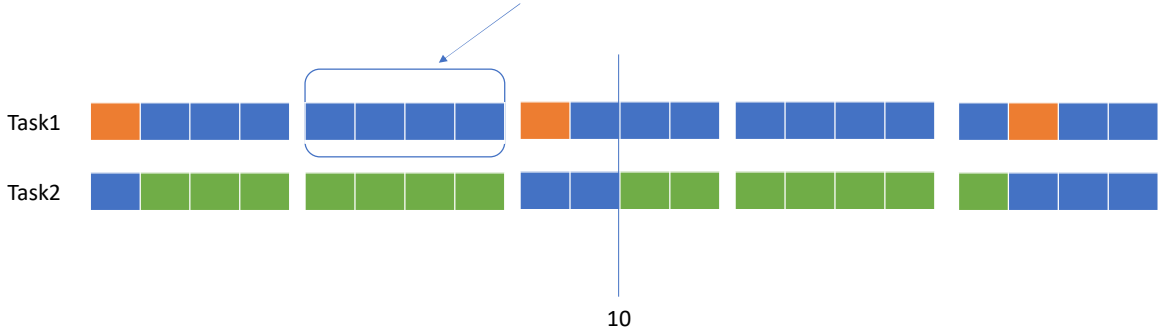
**Problem1 a) Rate monotonic schedule**




1

**Problem1 b) since it's with mutex, we can find out it's not feasible anymore like here, the deadline is not met.**




2

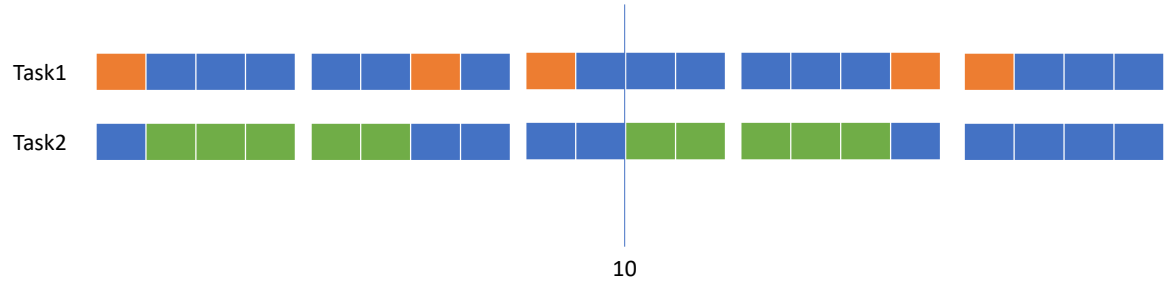
**Problem1 c) anytime algorithm, using Liu Layland Criteria:**
**This is sufficient, so maximum of e2 is 5.**
**According to the graph shown downside, it could work out.**

$$\sum_{i}^{N} \frac{C_i}{T_i} \le N(2^{1/N} - 1)$$

$$\frac{1}{4} + \frac{e_2}{10} \le 2(2^{1/2} - 1)$$

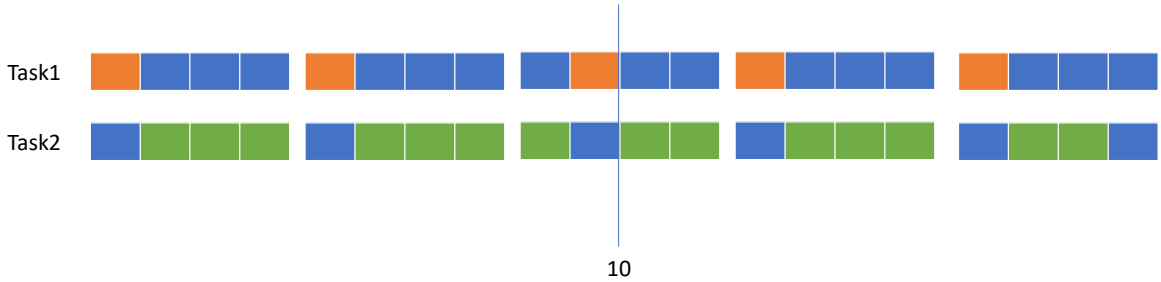
we have

$$e_2 \le 5.78$$




3

**Problem1 d) For EDF, the deadlines are met and the schedule is feasible.**



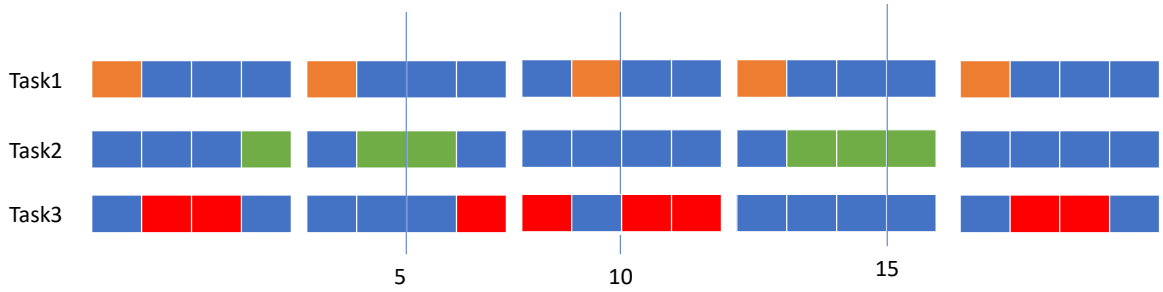

4

**Problem1 e) Again we use the criteria like c):**
**As shown in the graph, for e2 = 3,**
**It works out. They meet the deadlines.**

$$\sum_{i}^{N} \frac{C_i}{T_i} \le 1$$

$$\frac{1}{4} + \frac{e_2}{10} + \frac{2}{5} \le 1$$

$$we \text{ have } e_2 \le 3.5$$




5

**Problem2**

$$a) \Box(\neg(T_{1,\text{ use}} \wedge T_{2,\text{ use}})) \equiv specA$$

$$b) \Box\Diamond(\neg T_{1,\text{ use}}) \wedge \Box\Diamond(\neg T_{2,\text{ use}}) \equiv specB$$

$$c) \Box(T_{1,req} \rightarrow \Diamond T_{1,\text{ use}}) \wedge \Box(T_{2,req} \rightarrow \Diamond T_{2,\text{ use}})$$

$$d) \Box\Diamond(\neg T_{1,\text{ req}}) \wedge \Box\Diamond(\neg T_{2,\text{ req}})$$

$$e) \Box(T_{1,\text{ rel}} \rightarrow (\neg T_{1,\text{ use}} \cup T_{2,\text{ use}})) \wedge \Box(T_{2,\text{ rel}} \rightarrow (\neg T_{2,\text{ use}} \cup T_{1,\text{ use}})) \wedge specA \wedge specB$$

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