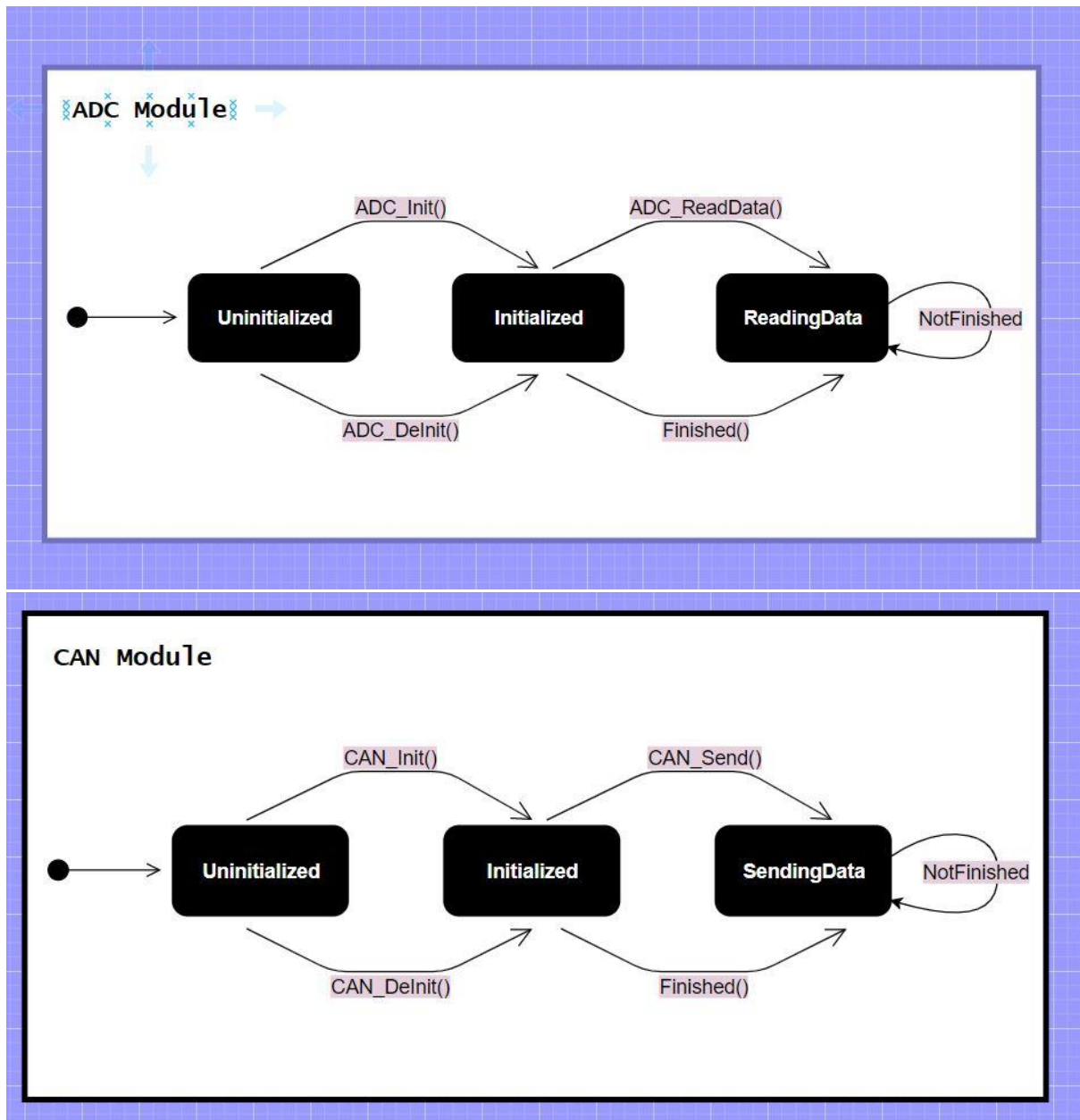
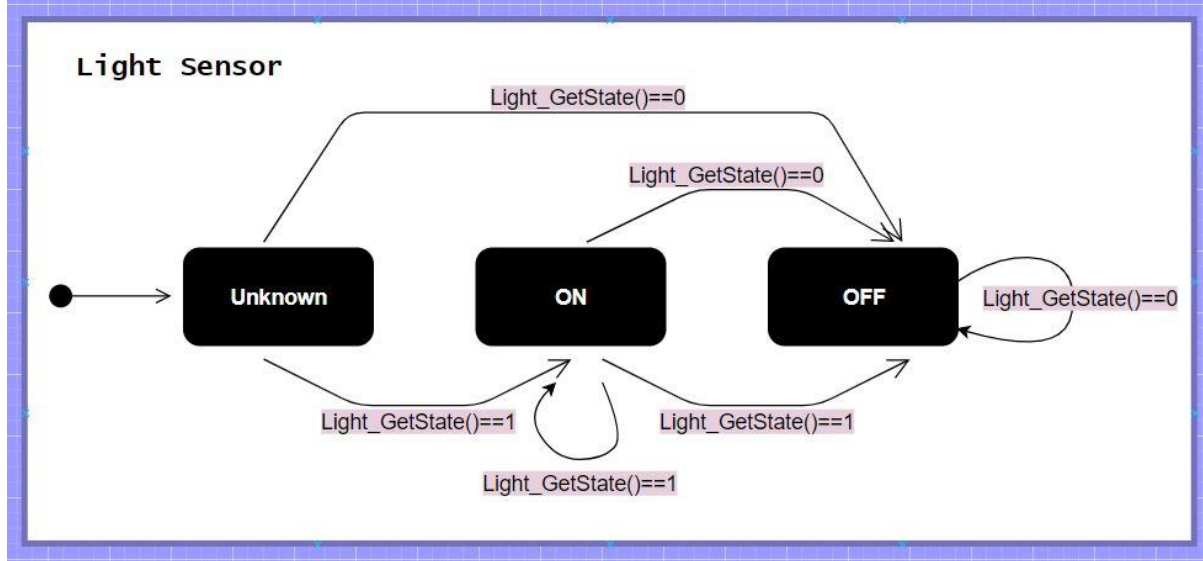
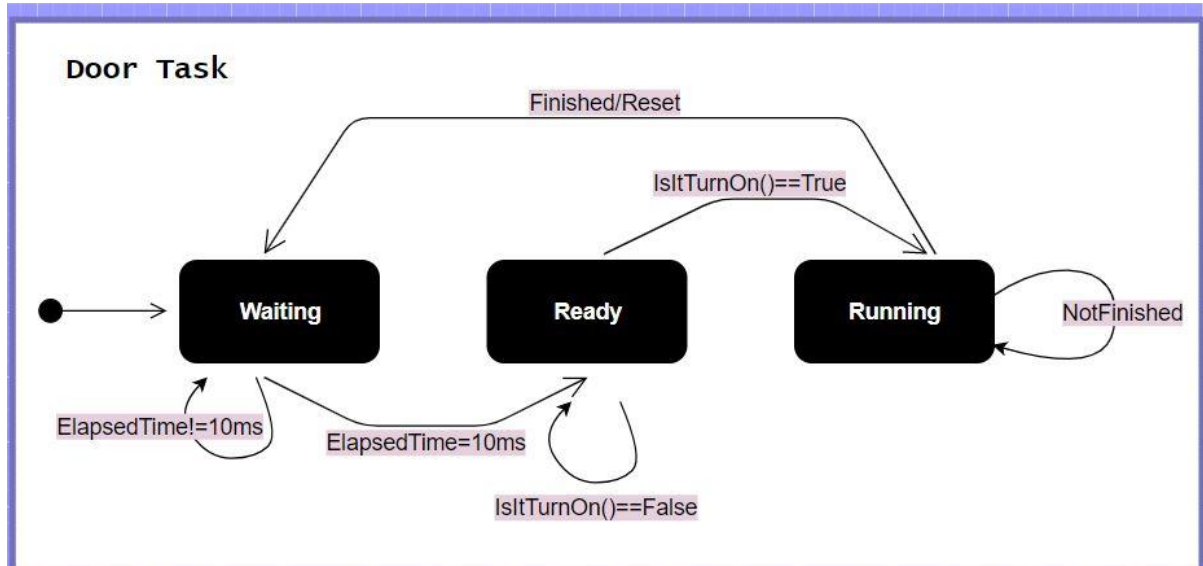
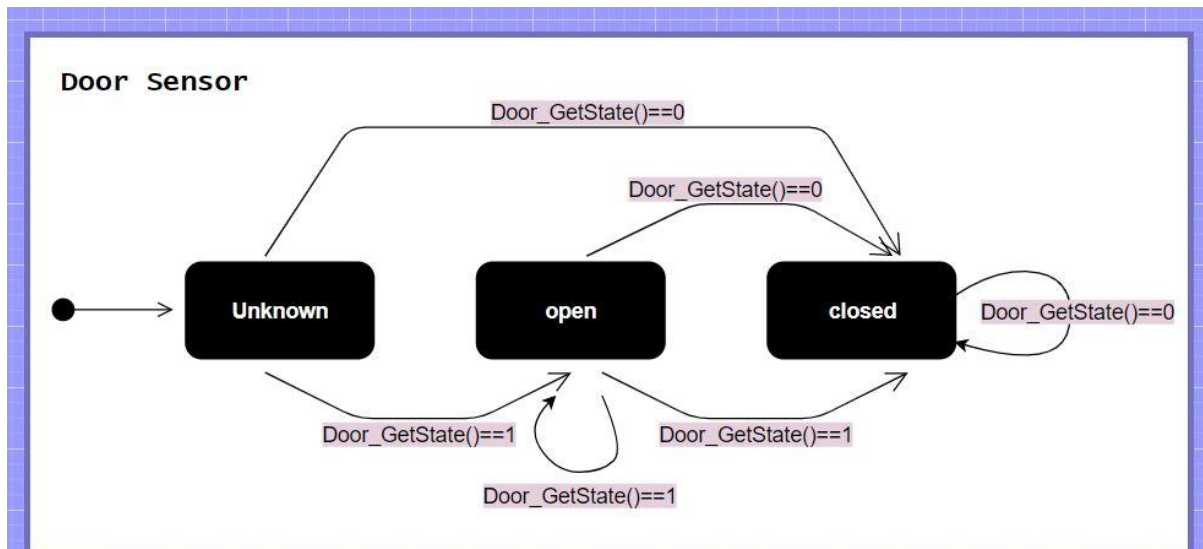


# Dynamic Design

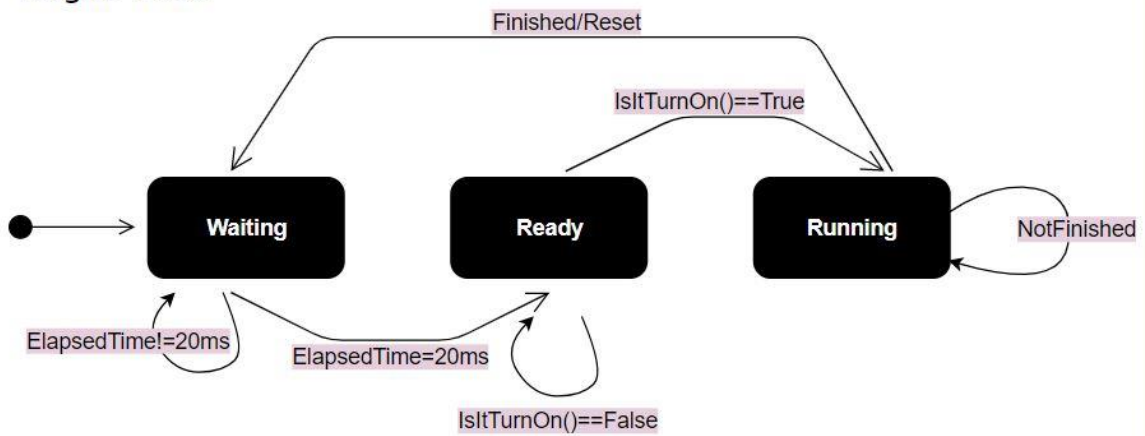
## ECU1:

### FSM for each component of ECU1:

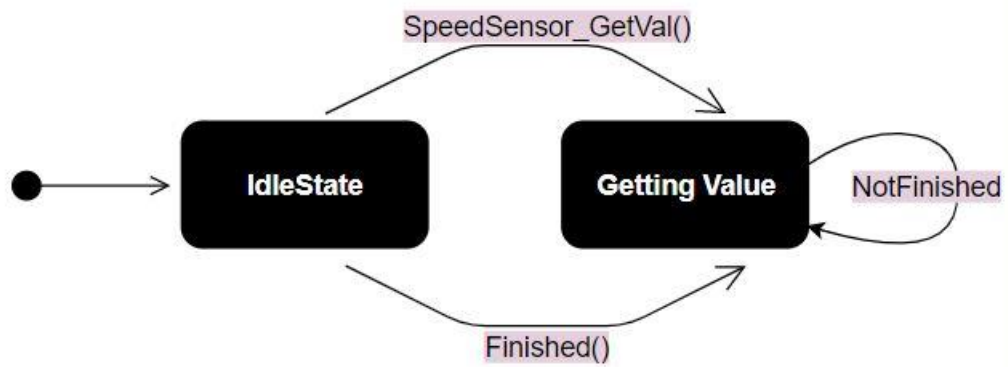


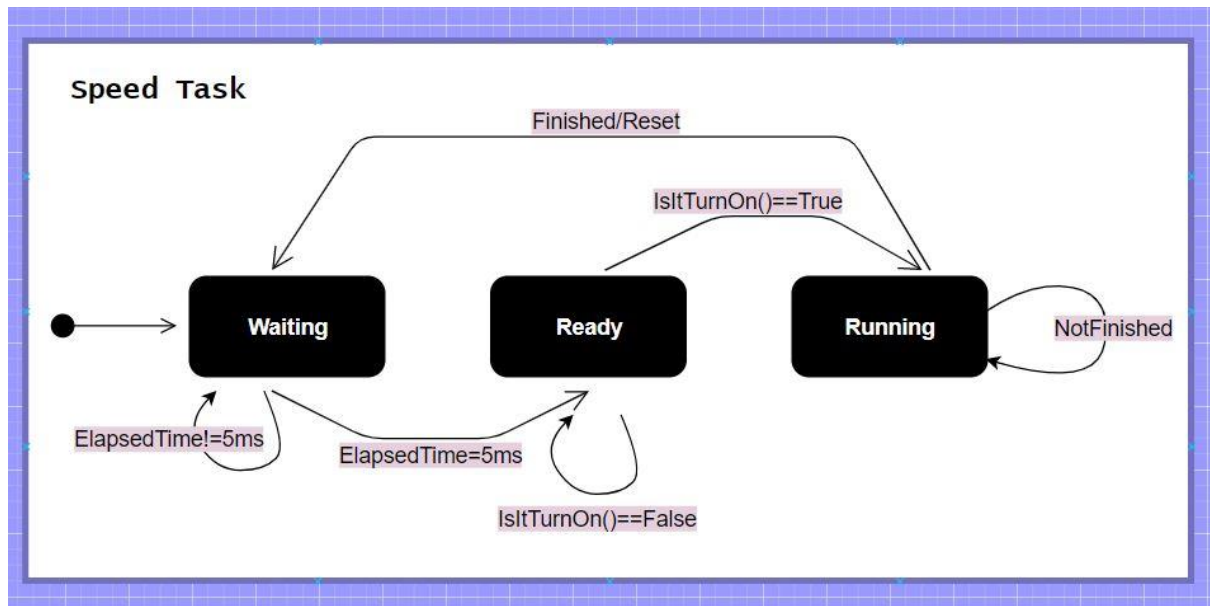


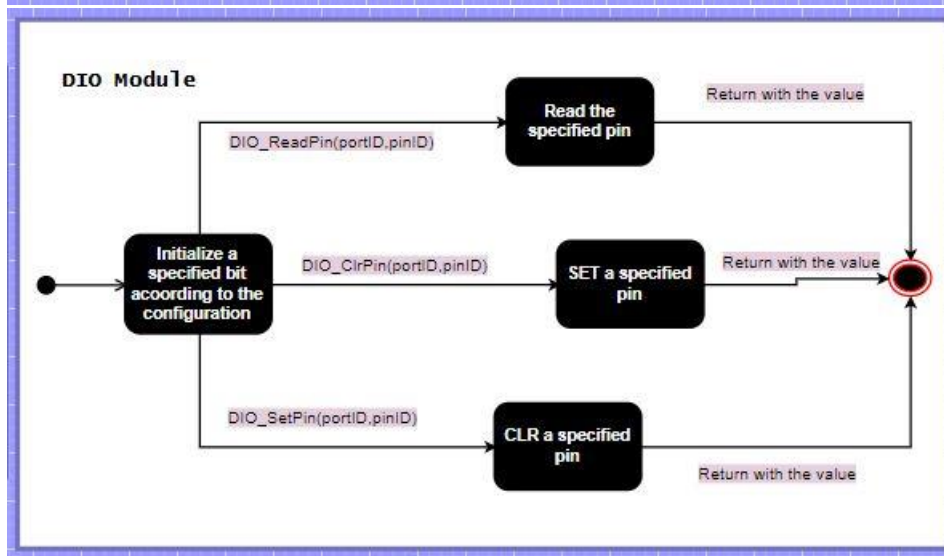
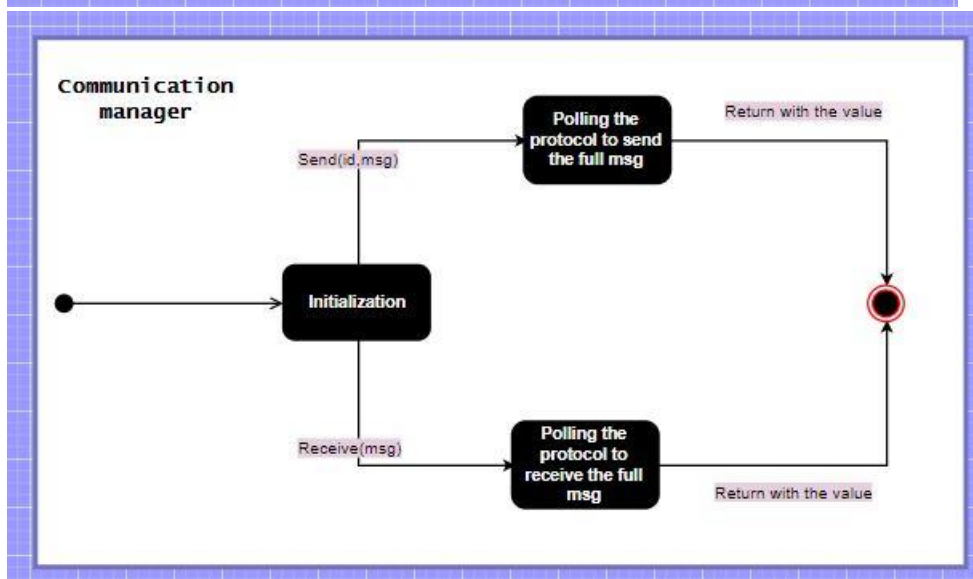
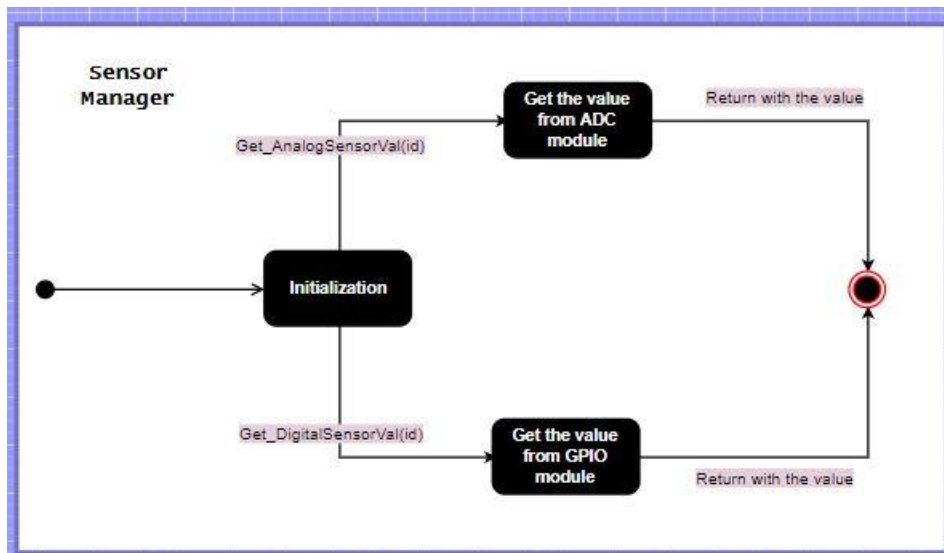
### Light Task



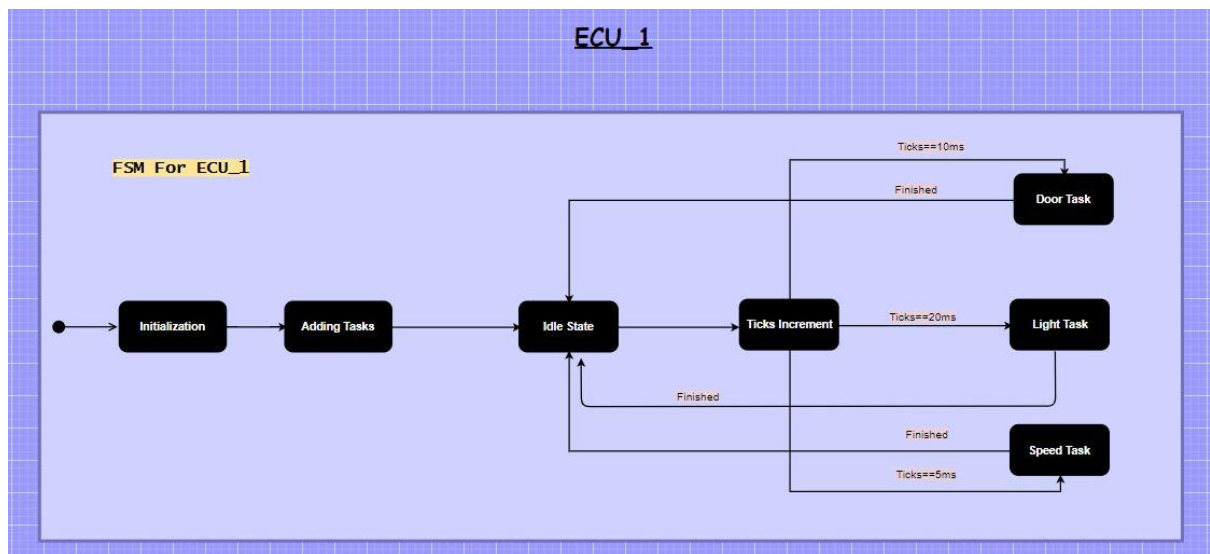
### speedSensor



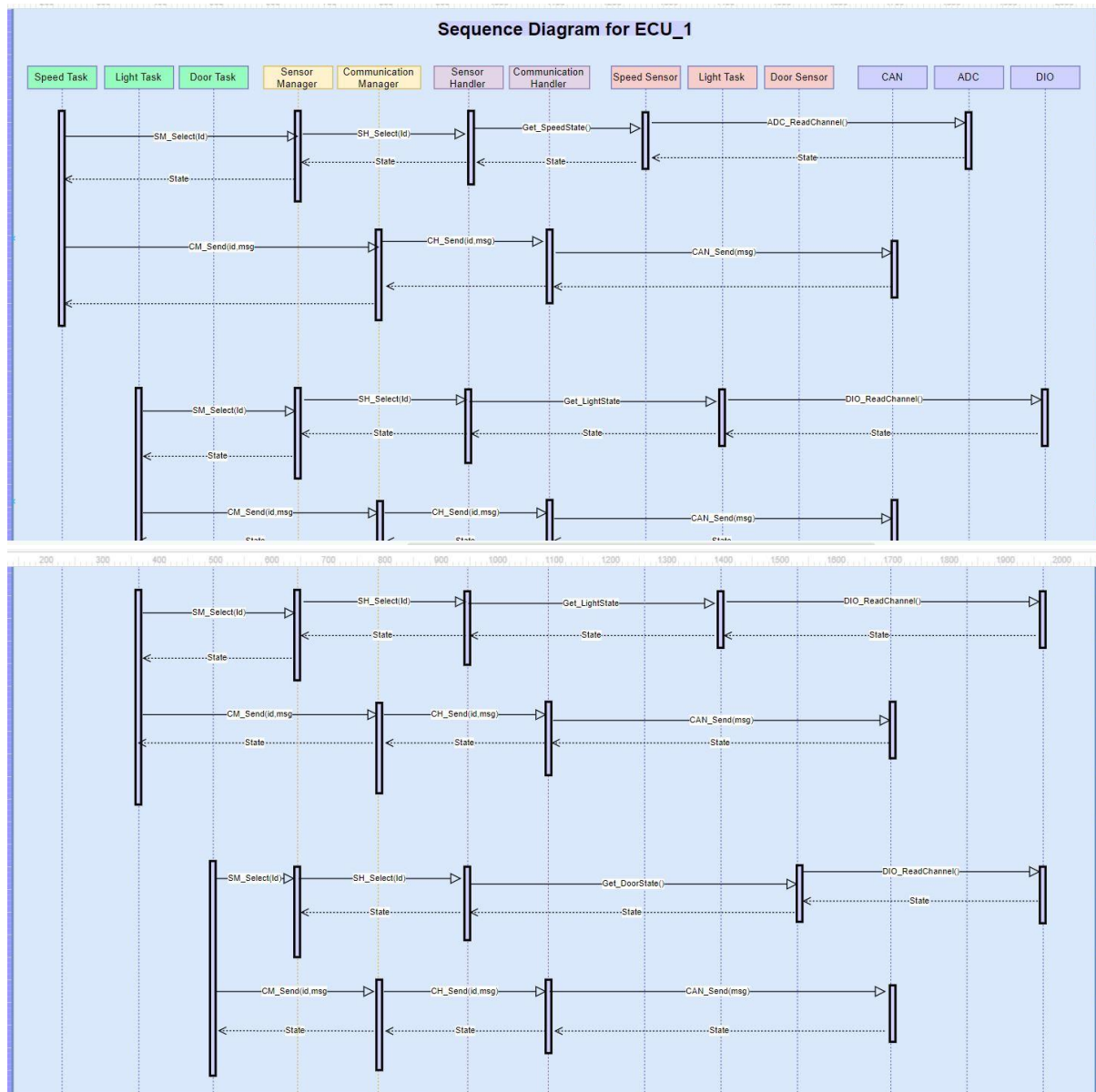




## FSM for ECU1:



## Sequence Diagram:



## CPU Load:

**Assuming all tasks execution time = 1ms:**

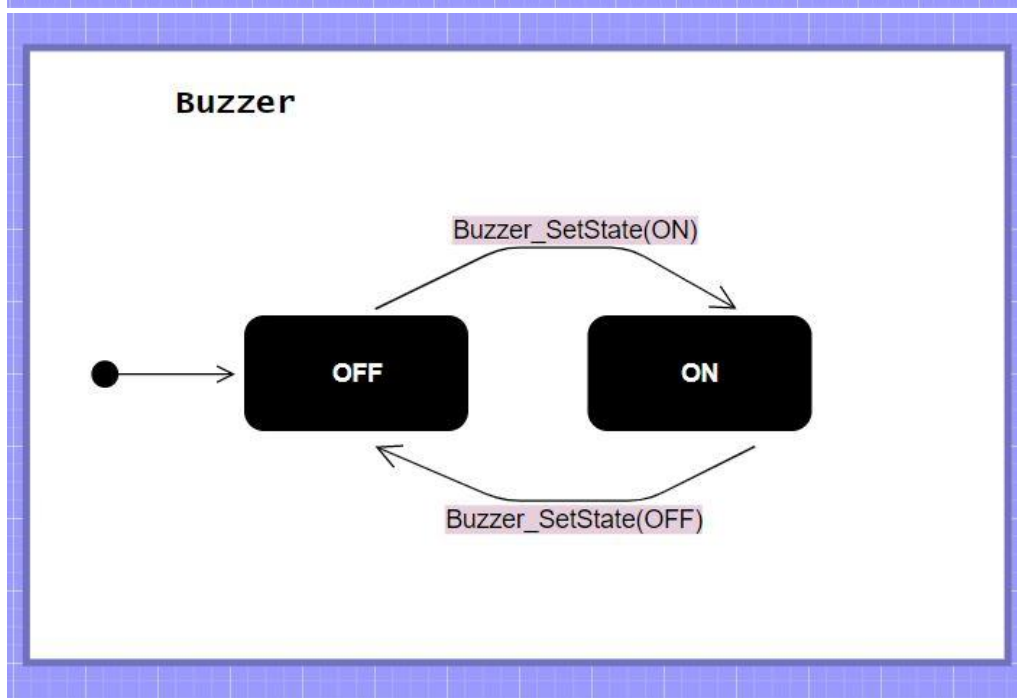
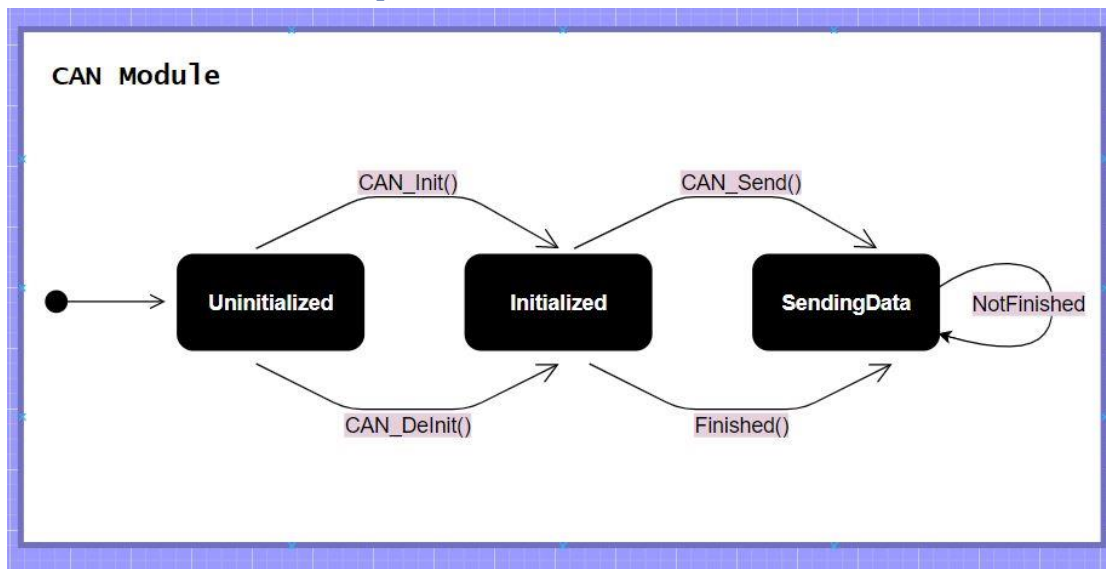
$$U = (E1 + E2 + E3)/H = (1 * 1 + 1 * 2 + 1 * 4)/20 * 100 = 35\%$$

**Author: Esraa Ahmed**

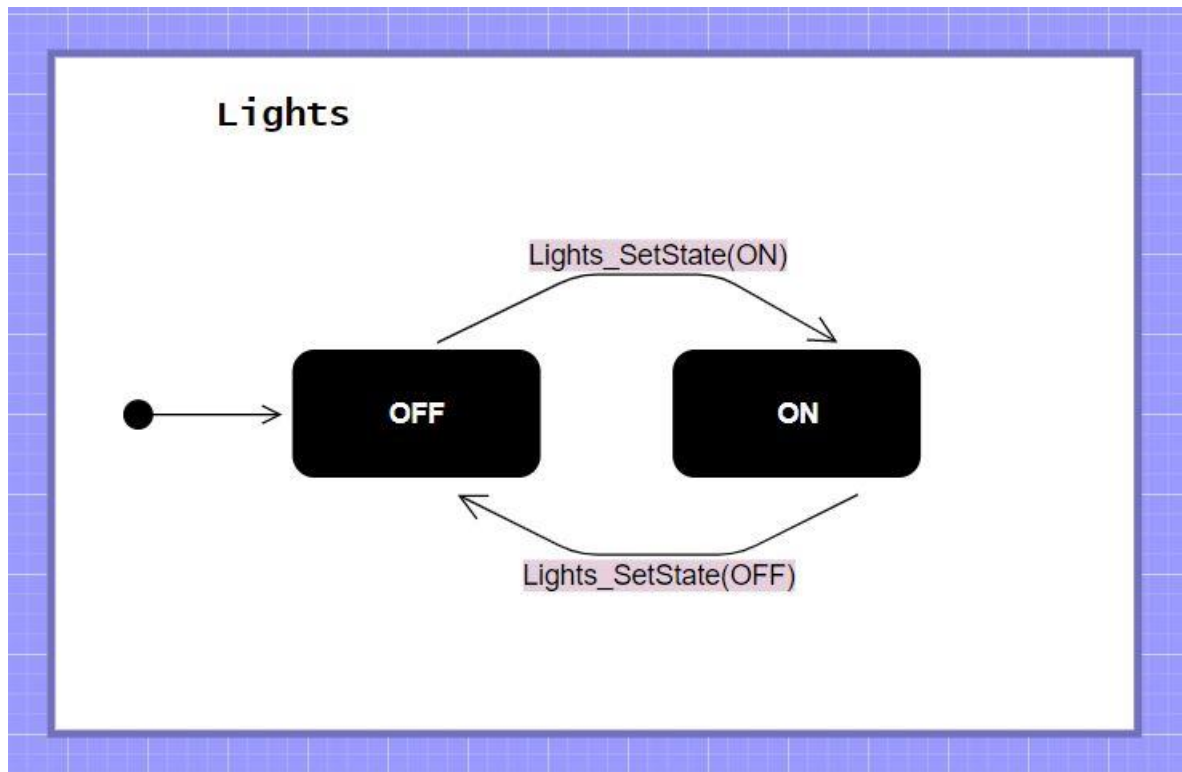


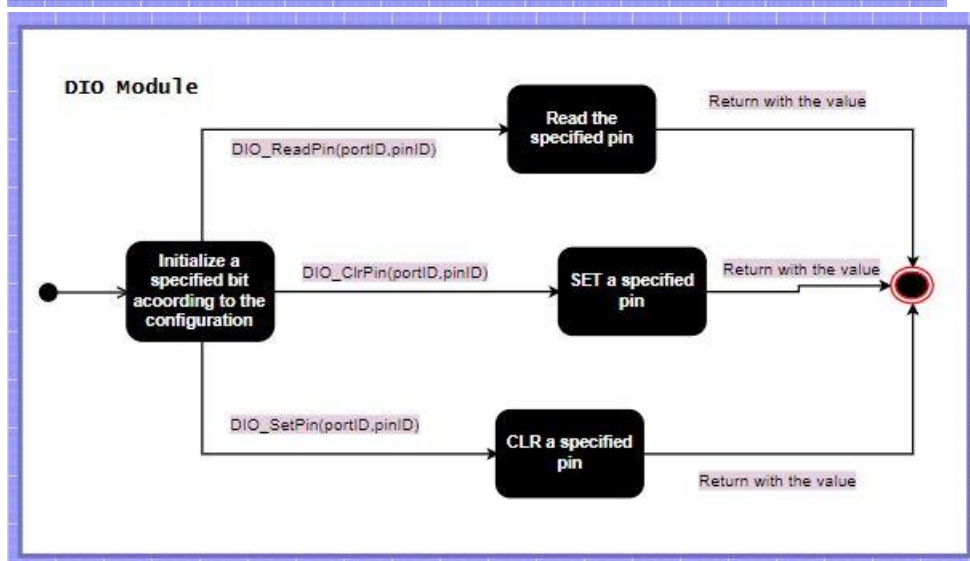
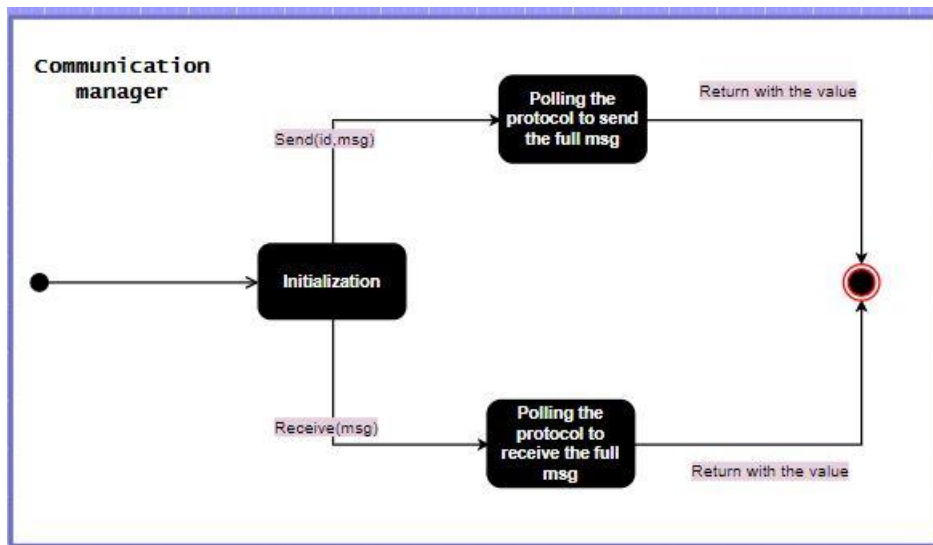
## ECU2:

### FSM for each component of ECU2:

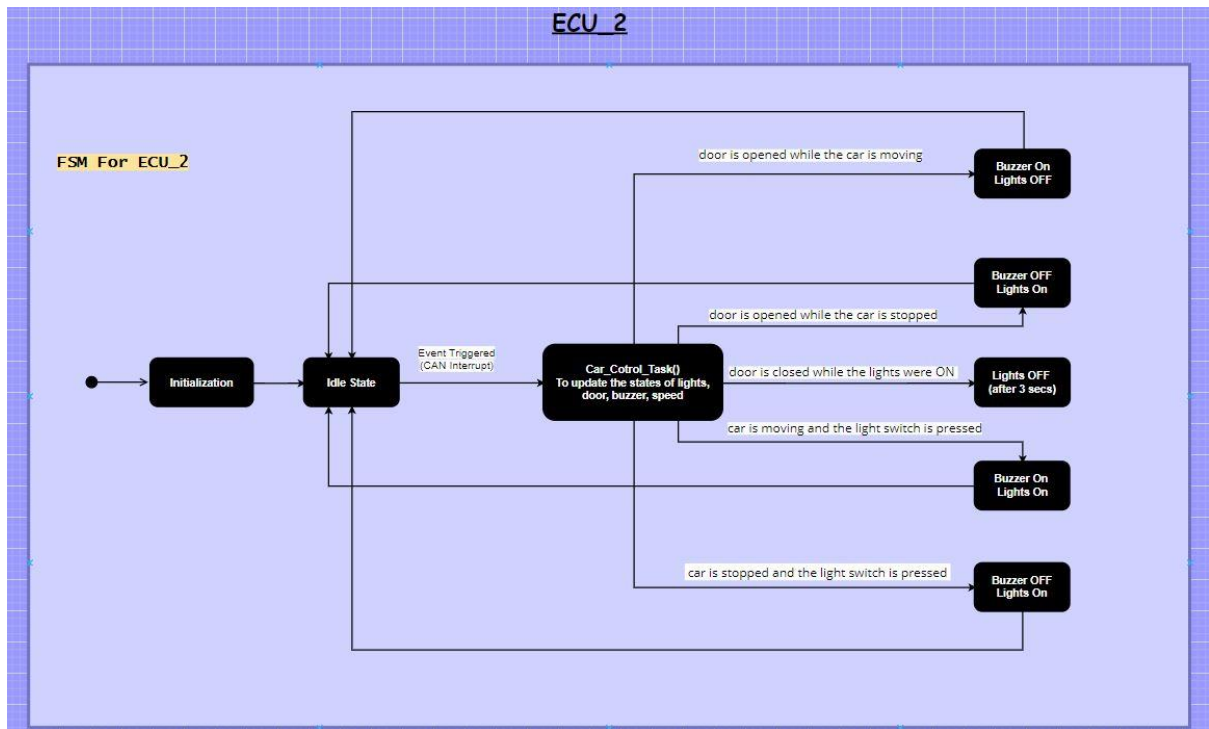




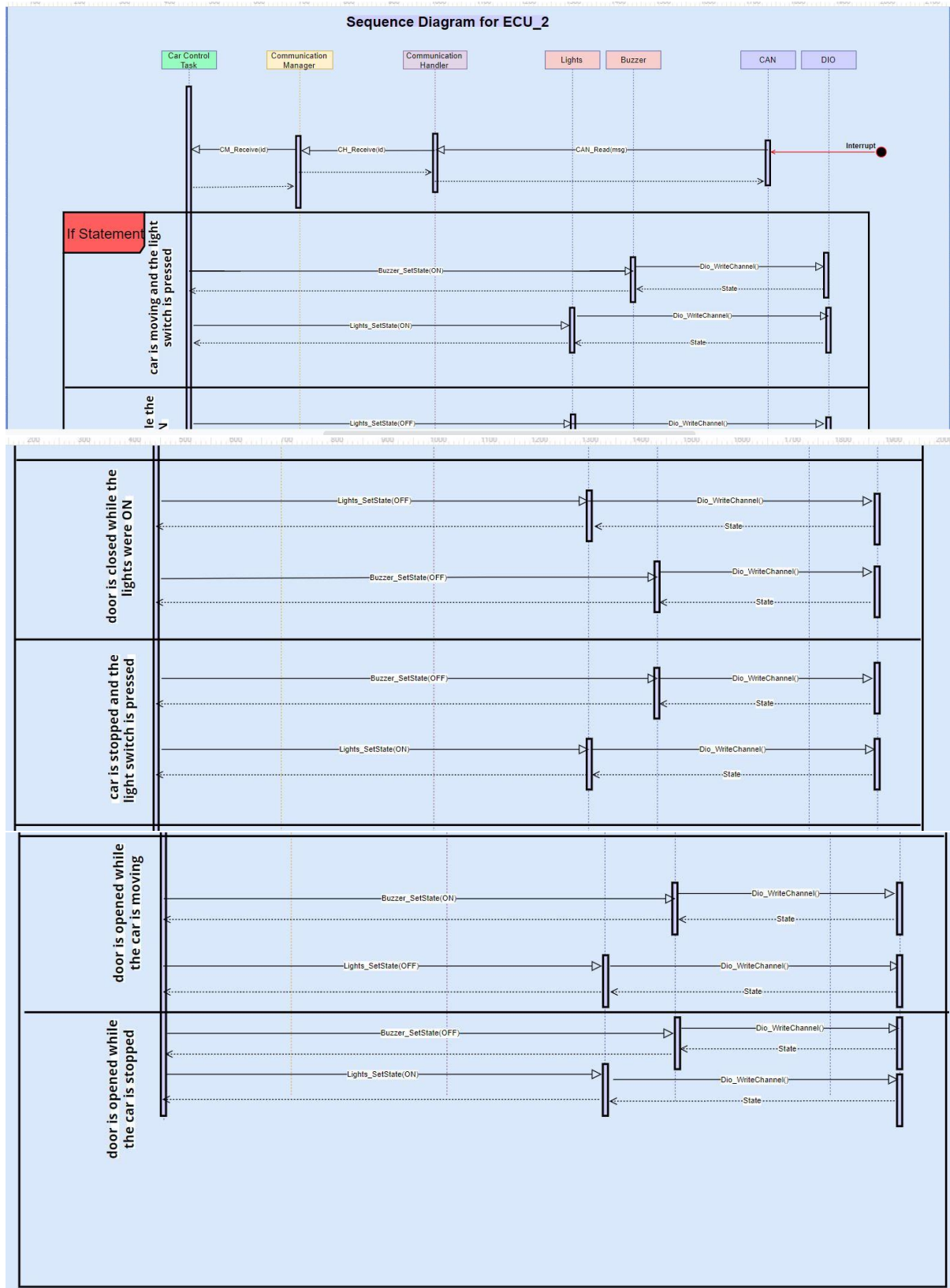




**FSM for ECU2:**



# Sequence Diagram:



**Author: Esraa Ahmed**

## **CPU Load:**

**Assuming all tasks execution time = 1ms:**

$$U = (E1)/H = (1 * 1)/5 * 100 = 20\%$$

## **Bus Load:**

**Assume:**

**Frame = 32bit**

**Bitrate = 100kBit/s**

$$t_{\text{frame}} = 32\text{bit} * 1/100 \text{ kBit/s} = 320\text{us}$$

$$\text{frames/sec} = 1000/5 + 1000/10 + 1000/20 = 350$$

$$t_{\text{bus}} = 350 * 320\text{us} = 112000\text{us} = 0.112\text{s}$$

$$\text{Bus Load} = 0.112 * 100 = 11.2\%$$