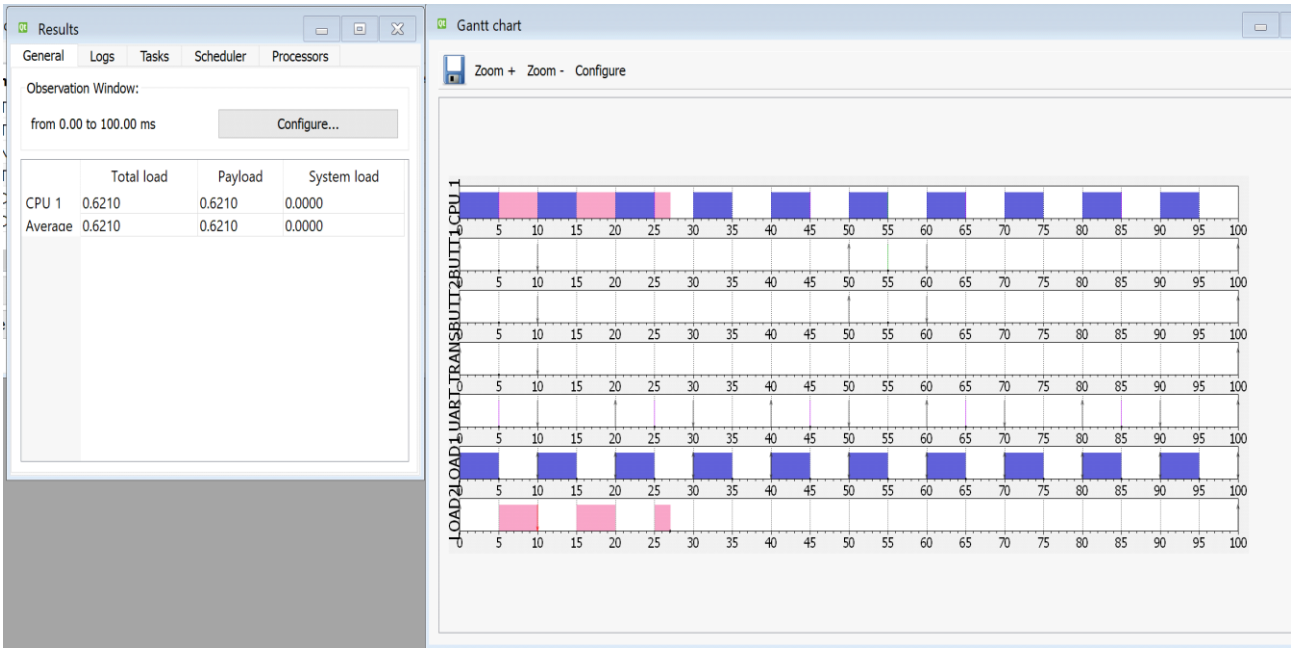
EDF Schedular Analysis Document

- **Simso Offline Simulation:**

  Comment: CPU load matches calculations exactly and all tasks meets their deadline.



Comments:

Load2 is pre-empted by load 1 as shown as its peridicity is the smallest

- **Keil logic analyser:**

  trace macros:

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GPIO and hooks display:

<u>Pin Configurations:</u>

Pin17:Tick hook
Pin20: button 1 monitor
Pin21:button 2 monitor
Pin19:Idle hook
Pin22:Periodic task
Pin23:UART task
Pin24:Load1
Pin25:Load2

- **<u>Hand written analysis:</u>**
  CPU load, Hyper period and URM calculations:

Time demand calculations:

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$$\text{Cpu Load} = \frac{(2\times2\times10^{-6}) + (2\times2\times10^{-6}) + (6.4\times10^{-6}) + (5\times12\times10^{-6}) + (5\times10^{-3}\times10) + (12\times10^{-3})}{100\times10^{-3}}$$

$$= 0.620744$$

$$= 62.1\ \%$$

Hyper_period = 100 ms

$$U = \frac{2}{50} + \frac{2}{50} + \frac{6.4}{100} + \frac{12}{20} + \frac{5}{10} + \frac{12}{100}$$

$$= 0.620744$$

$$URM = 6(2^{1/6} - 1) = 0.73477$$

Time demand:

* Load1 → $W(1) = 5 + 0 = 5$ & $W(1) < D$

* UART → $W(2) \rightarrow 12\,\mu s + \left(\frac{2}{1}\right) \times 5\,ms = 10.012 < 20$

* BUTT1 → $W(5) = 2\,\mu s + \left(\frac{5}{2}\right) \times 12\,\mu s + \left(\frac{5}{1}\right) \times 5\times10^{-3}$

$$= 25.032$$

$$< 50$$

* BUTT1 → $W(5) = 25.032 < 50$

* periodic → $W(10) = 6.4\,\mu s + 2\times\left(\frac{10}{5}\times2\,\mu s\right) + \left(\frac{10}{2}\times12\,\mu\right) + \left(\frac{10}{1}\right)\times5\,m = 50.058 < 100$

$W(10) = 50.078 + 12\,ms = 62.074$

Comments:

CPUload is equal to time demand so the whole system is in range of hyperperiod