1- Using Analytical Methods:

- CPU Hyperperiod

  Hyperperiod = LCM(50, 50, 100, 20, 10, 100) = 100

  LCM: Least Common Multiplier (for all tasks periodicities in this case)

Task	Occurrence During Hyperperiod	Execution Time
Button 1 Monitor	2	29us
Button 2 Monitor	2	29us
Periodic Transmitter	1	93us
UART Transmitter	5	30us
Load 1 Simulation	10	5ms
Load 2 Simulation	1	12ms

- CPU Load

  It is the total execution time during hyperperiod divided by hyperperiod

  U = [(29u*2) + (29us*2) + (93us*1) + (30us*5) + (5ms*10) + (12ms*1)] / 100ms

  = 0.624 * 100% = 62%

- System Schedulability

  We say the system is schedulable if U < Urm

  U = 0.624 < Urm = 0.735

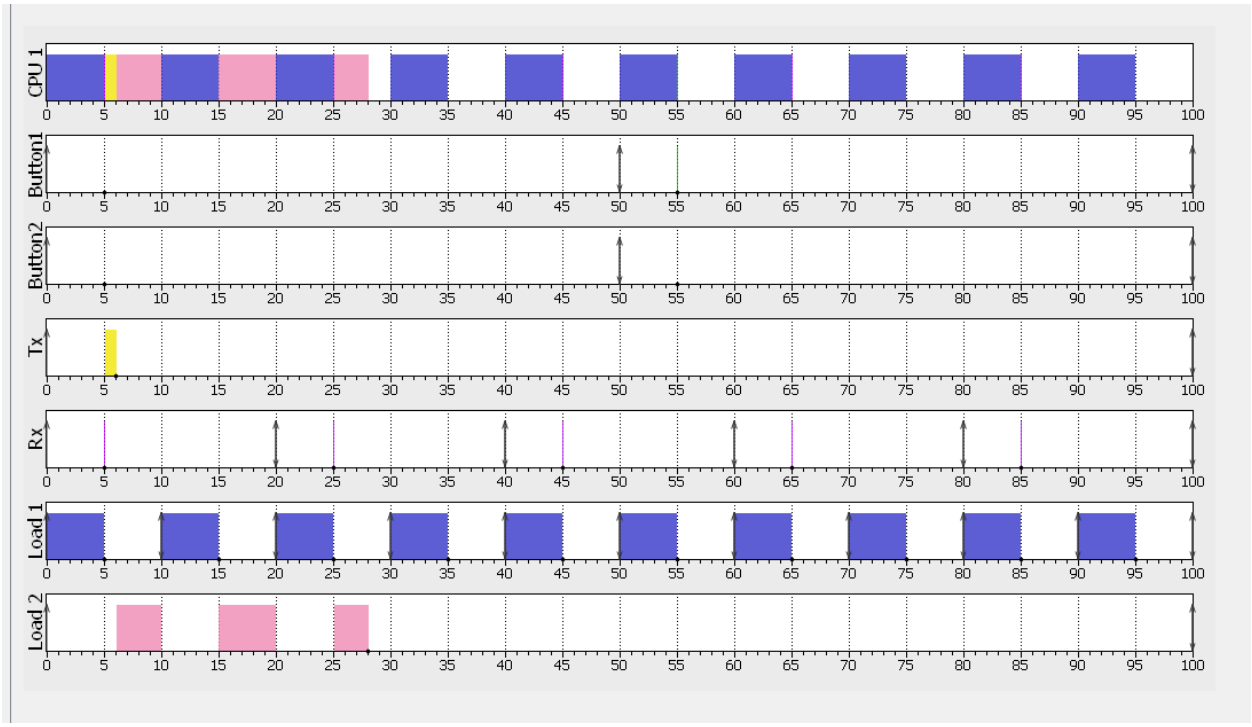
  Hence, the system is schedulable

2- Using Simso Offline Simulator

- CPU Load

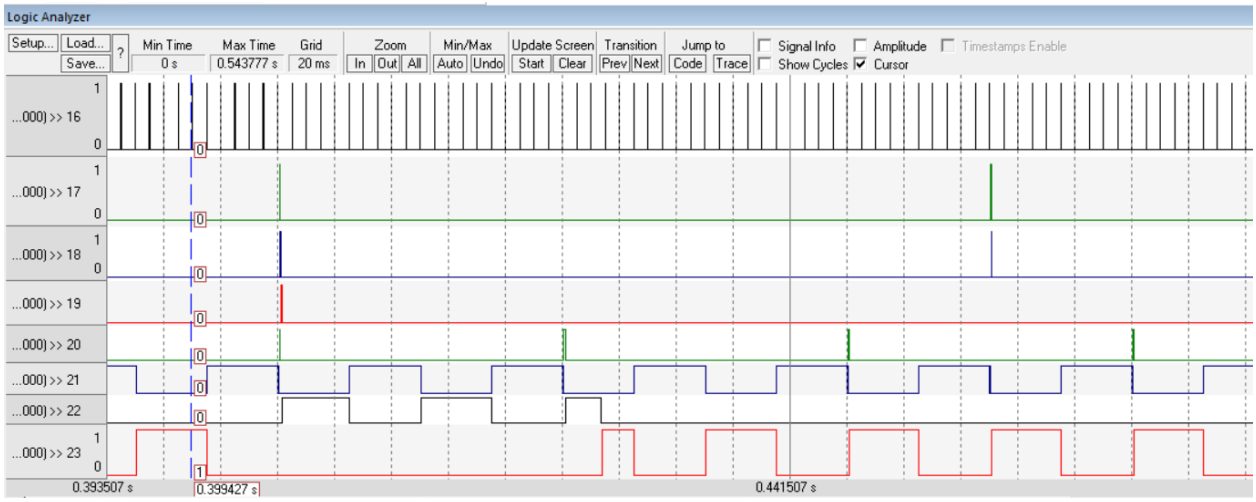
	Total load	Payload	System load
CPU 1	0.6320	0.6320	0.0000
Average	0.6320	0.6320	0.0000

- Gannt Chart



3- Keil Simulator

- Logic Analyzer



- CPU Load

Name	Value	Type
total_exeTime	0x00072699	uint
cpu_load	0x0000003F	uint
<Enter expression>		

4- Using time-demand analysis

First of all, We must define critical instant where all the tasks are schedulable at the same time.

critical instant = 100

Task	Periodicity	Execution Time	Time Provided
Button 1 Monitor	50ms	29us	50ms
Button 2 Monitor	50ms	29us	50ms
Periodic Transmitter	100ms	93us	100ms
UART Transmitter	20ms	30us	20ms
Load 1 Simulation	10ms	5ms	10ms
Load 2 Simulation	100ms	12ms	100ms

Then, we calculate worst response time for each task to check the schedulability.

If time demand is less than or equal to task periodicity then the task is schedulable.

- Button 1 Monitor:
  - W(50) = 29us + (50/10) * 5ms + (50/20) * 30us = 25.059ms
  - 25.059ms < 50ms
  - Task is schedulable

- Button 2 Monitor:
  - W(50) = 29us + (50/10) * 5ms + (50/20) * 30us + (50/50) * 29us = 25.087ms
  - 25.059ms < 50ms
  - Task is schedulable

- Periodic Transmitter:
  - W(100) = 93us + (100/10) * 5ms + (100/20) * 30us + (100/50) * 29us + (100/50) * 29us = 50.36ms
  - 50.36ms < 100ms
  - Task is schedulable

- UART Receiver:
  - W(20) = 30us + (20/10) * 5ms = 10.03ms
  - 10.03ms < 20ms
  - Task is schedulable

- Load 1 Simulation:
  - W(10) = 5ms + 0 = 5ms
  - 5ms < 10ms
  - Task is schedulable

- Load 2 Simulation:
  - W(100) = 12ms + (100/10) * 5ms + (100/20) * 30us + (100/50) * 29us + (100/50) * 29us + (100/100) * 93us = 62.45ms
  - 62.45ms < 100ms
  - Task is schedulable

All tasks of the system are schedulable and don't miss their deadline, so the system overall is **schedulable**.