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Assignment 1 – Implementation Description:

As per the assignment 1 problem statement, the code is implemented to create a generic function which initializes the threads based on “NUM_THREADS” and a generic function to create mutexes based on “NUM_MUTEXES” parameter. Each thread will perform the 3 computations based on the “Loop_iteration” parameter and locks and unlocks the mutexes as per the id in the task set. The program is implemented such that all threads are started at the same time only after entering “activate” shell root command. All the debugging and “printk” statements were verified on “minicom” terminal. The main timer, which is implemented in the program, takes the duration as “TOTAL_TIME” and the expiry function will suspend all the threads on the timer expiration. The program is tested by changing the inputs in task sets. Below are the attached two screenshots of the results from “SystemView” and their inputs as following. The two runs are conducted with the high and no priority inheritances as stated in assignment.

Screenshots:

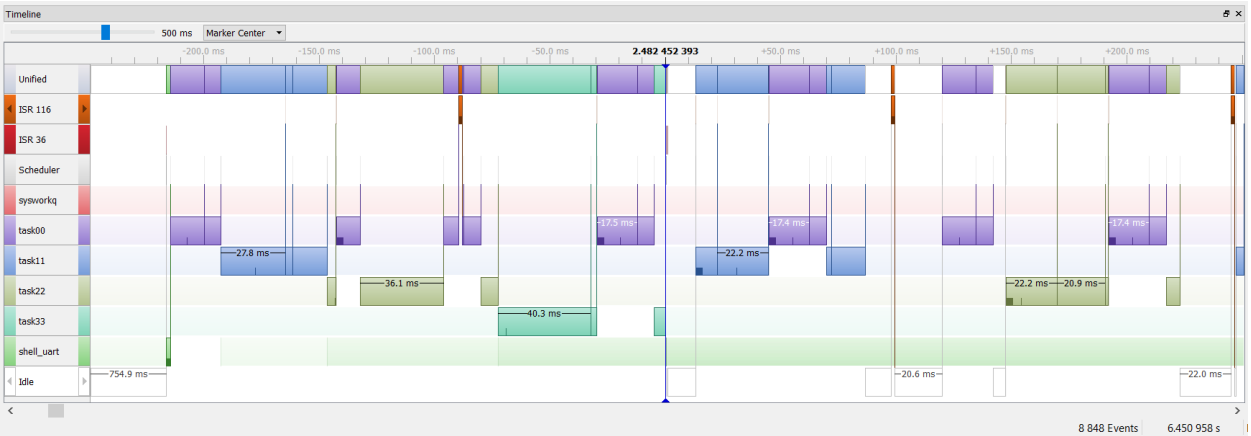
Input set for run 1:

NUM_MUTEXES 3 // number of mutexes
NUM_THREADS 4 //number of threads
TOTAL_TIME 4000 // total execution time in msec

Thread inputs:

THREAD0 {"task00", 2, 50, {400000, 400000, 400000}, 1}
THREAD1 {"task11", 3, 160, {800000, 900000, 800000}, 0}
THREAD2 {"task22", 4, 220, {200000, 2000000, 400000}, 1}
THREAD3 {"task33", 5, 360, {200000, 2000000, 400000}, 2}

CONFIG_PRIORITY_CEILING=10



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Input set for run 2:

NUM_MUTEXES 3 // number of mutexes
NUM_THREADS 4 //number of threads
TOTAL_TIME 5000 // total execution time in msec

Thread inputs:

THREAD0 {"task00", 6, 50, {500000, 450000, 400000}, 2}
THREAD1 {"task11", 3, 160, {700000, 900000, 800000}, 0}
THREAD2 {"task22", 4, 220, {600000, 3500000, 400000}, 1}
THREAD3 {"task33", 5, 360, {100000, 2000000, 400000}, 2}

CONFIG_PRIORITY_CEILING=0