CS3523 OPERATING SYSTEMS 2

PROGRAMMING ASSIGNMENT 3

Design for RMS,EDF Algorithms:

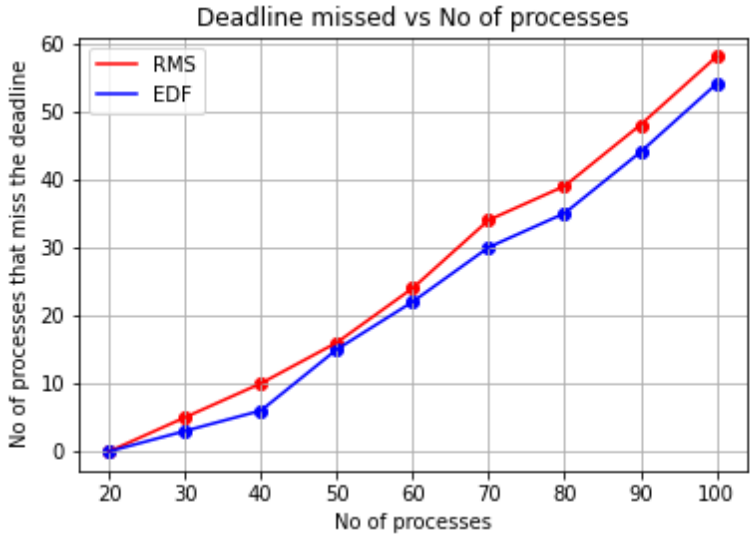
- Both the programs accepts the input from a file inp-params.txt and stores them in arrays.
- Rate monotonic scheduling algorithm gives priority based on their periodic times.
- Earliest deadline first algorithm gives priority based on their deadlines.
- RMS is a static priority scheduling & the priorities of the processes remains same through out the algorithm.
- While EDF is a dynamic priority scheduling . So, the priorities of the processes changes according to the deadlines.
- In both the programs function min_process_id calculates the pid (process identifier) of the next process that has to be executed & the function calculates the pid by choosing the process which has the least period among all other processes.
- Void RMS(int),Void EDF(int) functions implement the rate monotonic scheduling, earliest deadline first algorithms respectively. These functions call the min_process_id function & stores the pid of the next process that has to be executed. Here we check for every second if there is any new process coming .
- When there is difference between the pid's of previous & next processes it arises the following cases .
  a. The previous process had completed it's execution & The new process had started it's execution.
  b. The previous process had preempted the new process due to high priority of new process.
  c. All the processes completed their execution before deadline (OR) If the scheduler knows that the processes in the ready

queue will miss their deadlines then then those processes will be terminated immediately & checks for another process If there are none CPU will be idle till further interruptions.

- The execution time of new process will be decreased by 1 ms since it will be occupied by the CPU for next 1ms & waiting times all the remaining processes will be increased by 1ms.
- The deadline time for the new process will also be decreased by 1ms. As it completed 1ms of it's execution time.
- Since the processes are periodic while iterating for each second we update the remaining time , deadline time of each process at their deadlines & increase the no of iterations of each process .

COMPARISON OF PERFORMANCE OF RMS,EDF ALGORITHMS:

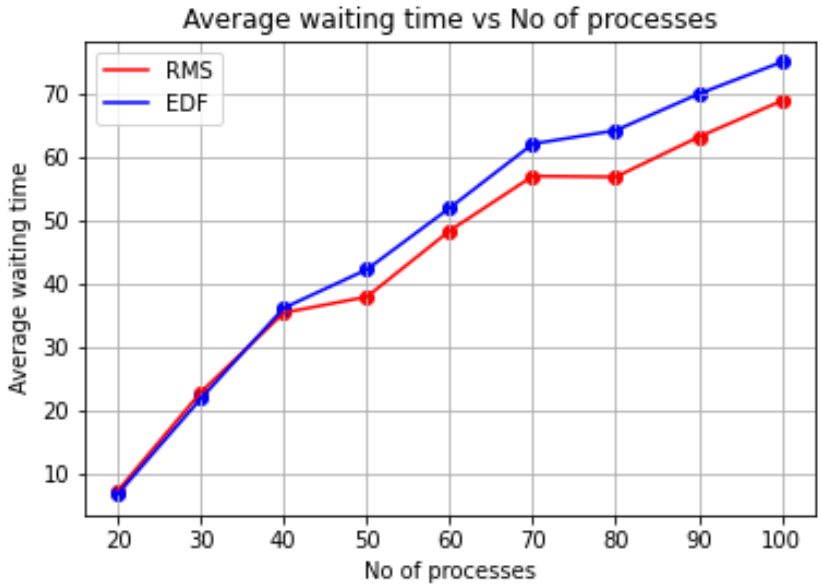
- The following graph gives an overview of No of processes that missed their deadlines vs No of processes that entered the system while scheduling in both algorithms .



- Now we can see that RMS algorithm results in more processes which are missing their deadlines than the EDF algorithm. (The

results are based on input we may get EDF high than RMS by giving another input)

- The following graph gives an overview of Average waiting time vs No of processes that entered the system while scheduling in both algorithms



- Now we can see that EDF algorithm results in more average waiting time than the RMS algorithm . (The results are based on input we may get RMS high than the EDF by changing the input)
- So, Each algorithm had it’s own advantage of scheduling processes one have the less no of processes missing deadlines while the other have less average waiting time .

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