**OPERATING SYSTEM (PRACTICALS) – FALL 2012**

**EXPERIMENT 5 – PROCESS STATE MODEL**

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| **DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_** | | **Students Names: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** | |
| **Marks Obtained: \_\_\_\_\_** | | **COURSE: BESE 16 \_\_\_\_\_** | |
| **Deadline: 1400 hrs 5th Nov 2012** | | **Instructor: Engr. Umar Mahmud** | |
|  | **Instructions**   * This lab is to be performed by a syndicate of at most **TWO** students. Write your remarks next to the space provided. * Plagiarism is strictly forbidden. * Submit hard copy of the report before deadline. Marks will be deducted for late submissions. | |  |
| 1. | **Objectives:**   1. Learning process 5 State Process Model. 2. Simulating 5 State Process Model. | |  |
| 2. | **Time Required:** 3 hrs | |  |
| 3. | **Software Required:**   1. Java/C/C++/C# 2. Windows/Ubuntu | |  |
| 4. | **Process States:** As a process executes, it changes *state*. The states of a process are: -   1. **New:** The process is being created 2. **Running:** Instructions are being executed 3. **Waiting:** The process is waiting for some event to occur 4. **Ready:** The process is waiting to be assigned to a process 5. **Terminated**: The process has finished execution | |  |
| 5. | **Process State Model:** Process state models describe the life cycle of a process. The Process State Model is given in Figure 1.    Figure 1. Process State Model | |  |
| 6. | Simulate the ‘5-State Process Model’ that shows the execution of different processes. Assume the following global parameters: -   1. Ready Queue Size is 5 2. Waiting Queue Size is 5 3. The Switch from Ready Queue to Waiting Queue or vice versa takes a total of 2 Seconds. 4. All Processes will be given a numerical PID for simulation. 5. Simulate a Process Control Block that holds the total time required to execute and the time of each I/O request. 6. A timer counts the total execution seconds of a process and updates it in the PCB. 7. You may use milliseconds or seconds as unit of time for your program simulation 8. A Process automatically terminates after it is completed. | | (6) |
| 7. | The Program must show the following: -   1. The Total Time Taken 2. The current state of the Queues. 3. The Creation and Termination times of Each Process. | |  |
| 8. | For the information in following set create the trace and show the output.   1. Example 1  |  |  |  |  | | --- | --- | --- | --- | | PID | Creation Time | Total CPU Time | I/O Operations | | P1 | T1 | 10 Seconds | 2 operations of 20 Seconds each | | P2 | T9 | 19 Seconds | 1 of 10 Seconds, and 2 operations of 20 Seconds each | | P3 | T20 | 25 Seconds | 2 operations of 40 seconds each |  1. Example 2  |  |  |  |  | | --- | --- | --- | --- | | PID | Creation Time | Total CPU Time | I/O Operations | | P1 | T1 | 20 Seconds | 3 operations of 20 Seconds each | | P2 | T9 | 40 Seconds | 1 of 5 Seconds, and 3 operations of 20 Seconds each | | P3 | T20 | 25 Seconds | 2 operations of 40 seconds each | | P4 | T25 | 50 seconds | 3 operations of 20 Seconds each | | P5 | T100 | 50 seconds | 3 operations of 20 Seconds each | | P6 | T125 | 50 seconds | 3 operations of 20 Seconds each | | | (4) |
| 9. | Applet at <http://courses.cs.vt.edu/csonline/OS/Lessons/Processes/index.html> | |  |