Operating Systems Assignments

Set 1

1. A computer system has enough room to hold four programs in its main memory. These programs are idle waiting for I/O half the time. What fraction of the CPU time is wasted?

2. Suppose that we have a message-passing system using mailboxes. When sending to a full mailbox or trying to receive from an empty one, a process does not block. Instead, it gets an error code back. The process responds to the error code by just trying again, over and over, until it succeeds. Does this scheme lead to race conditions?

3. Five batch jobs A through E, arrive at a computer center at almost the same time. They have estimated running times of 10, 6, 2, 4, and 8 minutes. Their (externally determined) priorities are 3, 5, 2, 1, and 4, respectively, with 5 being the highest priority. For each of the following scheduling algorithms, determine the mean process turnaround time. Ignore process switching overhead. (The turnaround time of a process is the time elapsed since it arrives at the system till it is terminated)

   (a) Round robin.

   (b) Priority scheduling.

   (c) First-come, first-served (run in order 10 , 6 , 2 , 4 , 8) .

   (d) Shortest job first.

   For (a), assume that the system is multiprogrammed, and that each job gets its fair share of the CPU. For (b) through (d) assume that only one job at a time runs, until it finishes. All jobs are completely CPU bound.