Class Note 10/21

Exam 2: Chapter 6-9 and Assignment 2

1. Using Dynamic Linking llib over static linking:

   Advantages:

   - take up space share between exe to update easily,
   - security fix

   Disadvantage:
   - dependence of earlier library that are subject to change
   - during update, updating process may fail

   dll:

   - Starts out as file
   - When process using it, it is in

2. G Generate random number to check the value, ensure checking process does not start before generating by synchronization

   Mutual exclusion: prevents simultaneous access to a shared resource.

3. In newer computer, <u>race condition</u> is a problem as something is deal with value created before___

   a. Race Condition occurs when two or more threads can access shared data and they try to change it at the same time.

4. Process Deadlock: waiting for 2+ processes, be able to take the one thing waiting for and hold it, lock it, exclusions
   a. a set of **processes** are blocked because each **process** is holding a resource and waiting for another resource acquired by some other **process**
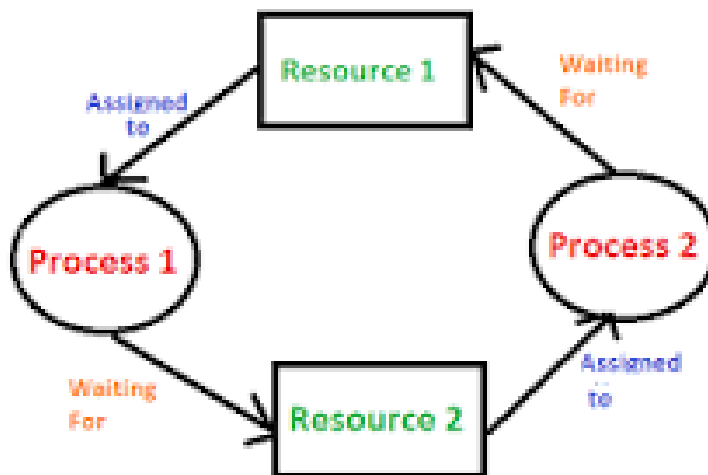
b. Sharing
c. Waiting
d. Holding
e. Lock/Excluding

CG

Process that gen process that checks by ____

Non-Preempt

Arrive->Run

5. FCFS

1->2->3->4

Wait time on process 4: run at time 6 something else 4

TA time on process 4: finish at 8x8, run at 4, 8-4 = 4?

6. SJF (start at process 1 then find smallest of the next)
1->3->2……

7. Priorities (higher number of priority first)

Wait Time= (Start Time – Arrival Time) = (Turnaround time – Burst Time/Running time):

- Priority
- FCFS (3+2+1+3+2+1)

Turnaround Time P6 (Previous Process Finish Time – Previous Process Arrival Time):

Process Table

Process	Burst Time (in milliseconds)
P_1	24
P_2	3
P_3	3

Turn around time for $P_1 = 24 - 0 = 24$ ms

Turn around time for $P_2 = 27 - 24 = 3$ ms

```
waitingTime = startTime - arrivalTime

turnaroundTime = burstTime + waitingTime = finishTime- arrivalTime
```

Round Robin, no wait, 1 process to another, if have time, move to the new arrival time

- If Process 4 is AT 5sec
  - 1->1->2->3->1->4
  - Go back to process 1 if there is no new sequential arrival time for new process
  - Context Switches: when CPU switches from one process/thread to another
    - Used to save states of preempted processes

To run multiple instances that gen process in consumer process/cluster, they communicate by

- Not piping or share file
- Multiple Thread
  - Kernel
  - User
    - Cannot use for no shared memory
    - Kernel Level Thread Schedules Kernel level thread
    - User Level Thread schedule by cruntime etc…
  - Affect of choosing K/U Level
    - Performance (user faster: 1 core)
      - Cannot use multiple cores as the program only knows about 1 core (not flexible)
  - 20M numbers (numbers.txt)
    - Find smallest value using 4 threads
      - Wall time (Not Compute Time)
        - Elapsed time (beginning to end of execution)
      - Handle Errors
        - Handle Data: read line by line
          - Best to use driver that opens file read itself or threat read →Index (Do Seek)