Rev/Eng/06

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01. Consider the following python coding segment ?

    for i in range(5):
        print(i)

    What are the data structures created by the operating system, if user run the above program.

02. Assume CPU request the virtual memory address of 010101010111. But according to page table, this page is currently not available in the main memory. Therefore Page fault occur and with the help of demand page techniques this page transfer from the virtual memory to Main Memory. Draw the process transition diagram to represent this process movements.

03. Draw the Process transition diagram to display the process movement of pre-emptive algorithm.

04. Draw the process transition diagram to display the process movement of non pre-emptive algorithm.

05. Consider following python program.

    x = 10
    y = 15
    z = input()
    total = x+y+z
    print(total)

    Assume above program is currently running and first two lines are already executed and terminated. The third line is currently executing inside the CPU. But because of the input requirement it move into the block state. Fourth line and fifth line still waiting in the ready state. Draw the process transition diagram to display the above situations.

06. Payroll.php is a program and currently running in the main memory. After executed some extend context switch occurs and another process enter into the running state. When payroll.php process is given the chance to run again, how operating system obtain the registers and other details about the payroll.php program.

07. Following program was saved in the hard disk as a calculate.php and the short name for this program is CAL. Memory details are shown in the following figure. The memory frames occupied by the operating system, calculate.php process are indicated on it by OS and CAL. Base on the OS and the CAL, write down the answers for the following questions.

    Memory

    x = 10
    y = 15
    z = input()
    total = x+y+z
    print(total)

OS
CAL

(i). When calculate.php program is running, in which place (OS or CAL) PCB will be reside.

(ii). Content of variable y=15 of the calculate.php

08. A and B are the two process. process A currently running in the CPU. Process B is reside in side the memory. Because of the Context switching process A transmit into the ready state and process B despatch into the CPU. Accordingly, which program is working during the context switching period which program is running inside the CPU.

09. Which program will frequently transfer into Block state, When following two programs are running,

total.py

```
x = 10
y = 15
z = input()
total = x+y+z
print(total)
```

avg.py

```
x = inuput()
y = input()
z = input()
avg = (x+y+z)/3
print(avg)
```

10. In the following table it indicate the few process states. What are the next state can be and write down the reasons.

Process	Next states	Reasons
Ready states		
Running States		
Block States		
Swapped and the Block state		
Swapped and the running state		

11. Write down the schedulers involve with the following transitions.
   (i). Process A transmit from main memory to CPU.   ....
   (ii). Process B transmit from main memory to secondary storage.   ....
   (iii). Process C transmit from Hard disk to main memory.   ....

12. Briefly explain about the following terms.
   (i). Arrival Time   (ii). Waiting time   (iii). Burst Time   (iv). Response Time
   (v). Throughput time

13. A computer uses 32 bit virtual addresses. This computer has a 1 GB physical memory and 4KB page size.
   (i). Write down the number of frames in physical memory.
   (ii). Write down the number of pages in virtual memory.
   (iii). if the virtual address 4095 of a particular process is mapped to Frame 2 of physical memory, write down in binary form, the physical address corresponding to the virtual address 4095.

14. The salary.php file is stored on blocks 100 and 102 respectively in a hard disk. To manage this file operating system maintain File Allocation Table (FAT). This hard disk uses a 8KB block size.
   (i). Write down the important number in the directory entry for the test.py file that will help the operating system to find the blocks of the file.
   (ii). Using example capacity for the salary.php file, explain the internal fragmentation situation.

(iii). Assume user add more data into the salary.php file and it added the 101 block also. Show the FAT table entries after this situation.

15. Why FAT is important ?