Operating Systems(CS-301)

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* Required

Untitled Section

*

Page fault frequency in an operating system is reduced when the
(a) size of page is reduced
(b) processes ten to be I/O bound
(c) processes tend to be CPU-bound
(d) locality of reference is applicable to the process

- [ ] A
- [ ] B
- [ ] C
- [x] D

*

Processor–bound tasks
(a) use the processor more often
(b) use more processor time
(c) use less processor time
(d) always take longer to execute

- A
- B
- C
- D

*

Consider the following events that happen during a context switch from (user mode of) process P to (user mode of) process Q, triggered by a timer interrupt that occurred when P was executing, in a Unix-like operating system design studied in class. Arrange the events in chronological order, starting from the earliest to the latest.

(A) The CPU executing process P moves from user mode to kernel mode.

(B) The CPU program counter moves from the kernel address space of P to the kernel address space of Q.

(C) The CPU program counter moves from the kernel address space of Q to the user address space of Q.

(D) The CPU stack pointer moves from the kernel stack of P to the kernel stack of Q.

(E) The OS scheduler code is invoked.

(a) BCADE

(b) AEDBC

(c) CADBE

(d) BECAD

- ○ A
- ◉ B
- ○ C
- ○ D

*

Protection can be achieved with protection bytes and _____
(a) internal fragmentation
(b) wasted memory
(c) fence register
(d) segmentation

- ○ A
- ○ B
- ○ C
- ◉ D

*

Under virtual storage
(a) a single program is processed by two or more CPU
(b) two or more programs are stored concurrently in primary storage
(c) only two active pages of program are stored in primary storage
(d) inter program interference may occur

- ○ A
- ○ B
- ◉ C
- ○ D

*

When process is assigned to partition ,the key value for that partition is stored in____
(a) PSW
(b) Limit Register
(c) MAR
(d) Base Register

- (●) A
- ( ) B
- ( ) C
- ( ) D

*

Consider six files :F1,F2,F3,F4,F5,F6 of corresponding sizes 100,200,70,40,250 and 50respectively,the files are to be stored on a sequential device in such a way that as to optimize access time .in order should the files be stored?
(a) F6,F5,F4,F3,F2,F1 (b) F1,F2,F3,F4,F5,F6
(c) F5,F2,F1,F3,F6,F4 (d) F4,F6,F3,F1,F2,F5

- ( ) A
- ( ) B
- ( ) C
- (●) D

*

Determine number of page faults when references to pages occur in the order 1,2,3,5,2,1,2,4. Assume that the main memory can accommodate 3 pages and the main memory already has the pages 1 and 2, with page 1 having been brought earlierthan page 2. (Asume LRU is used)

(a) 3
(b) 5
(c) 4
(d) none of the above

- ○ A
- ○ B
- ○ C
- ◉ D

*

From the following data and time slice value of 2 find out turn around time for process 3.

Process	Arrival	ServiceTime	Priority
1	1	8	2
2	2	2	4
3	3	1	3
4	4	2	4
5	5	5	1

(a) 9
(b) 3
(c) 10
(d) None

- ○ A
- ○ B
- ○ C
- ◉ D

*

Cascade termination refers to terminated of all child process before the parent terminates
(a) normally
(b) abnormally
(c) normally or abnormally
(d) none of these

- ○ A
- ○ B
- ◉ C
- ○ D

*

Consider the case of three jobs P1,P2 and P3 with run times as x,y,z respectively where x<y<z. Determine the mean turn around time if all processes arrive at time 0 and SJF scheduling technique is used.
(a) (3x + 2y + z)/3
(b) (2x + y)/3
(c) (x + y + z)/3
(d) None of these

- ◉ A
- ○ B
- ○ C
- ○ D

*

Dirty bit is used to show
(a) page with corrupted data
(b) the wrong page in the memory
(c) page that modified after being loaded into cache memory
(d) page that less frequently used

- ○ A
- ○ B
- ◉ C
- ○ D

*

Under the multiprogramming, turnaround time for short jobs is usually_____ and that for long jobs is slightly_____
(a) lengthened, shortened
(b) shortened, lengthened
(c) shortened, shortened
(d) shortened,unchanged

- ○ A
- ◉ B
- ○ C
- ○ D

*

If a virtual memory system has 4 pages in real memory and the rest must be swapped to disk. Which of the following is the hit ratio for the following page address stream? Assume that memory starts empty. Use the First In First Out (FIFO) algorithm

(a) 10%
(b) 15%
(c) 25%
(d) 31%

- ○ A
- ○ B
- ○ C
- ◉ D

*

From the following, select correct definition of valid process transition within an operating system

(a) wakeup: ready -> running
(b) dispatch: ready-> running
(c) block :ready-> blocked
(d) time run out :ready->blocked

- ○ A
- ◉ B
- ○ C
- ○ D

*

What is the name of the arrangement whereby several central processing units share one memory?
(a) Multi tasking
(b) Multi programming
(c) Multi processing
(d) Concurrent programming

- ○ A
- ○ B
- ◉ C
- ○ D

*

Relocatable programs
(a) can not be used with a fixed partition
(b) can be loaded almost anywhere in memory
(c) not need linker
(d) can be loaded only at one specific location

- ○ A
- ◉ B
- ○ C
- ○ D

*

The principle of "Locality of reference " gives a justification for the use of
(a) DMA
(b) polling
(c) cache memory
(d) virtual memory

- [ ] A
- [ ] B
- [x] C
- [ ] D

*

Suspend /Resume process is used to_____
(a) Recover from deadlock
(b) Starts the deadlock
(c) Indication of deadlock
(d) Just to end process to avoid load

- [x] A
- [ ] B
- [ ] C
- [ ] D

*

There were 4 processes p0,p1,p2,p3 arrived into the ready queue at time 0 in the order p0,p1,p2,p3. The Burst time of the processes are 5,2,3,4 ms respectively. RR scheduling technique is used with Time Quantum of 2ms. If the context switch takes 2 ns, then what will be the total time taken for all the context switches to finish the processes execution?

(a) 10ns
(b) 12ns
(c) 14ns
(d) 16ns

- ○ A
- ○ B
- ◉ C
- ○ D

*

Consider a process with 4 physical pages numbered 0–3. The process accesses pages in the following sequence: 0, 1, 0, 2, 3, 3, 0, 2. Assume that the RAM can hold only 3 out of these 4 pages, is initially empty, and there is no other process executing on the system. What is the minimum number of page faults that would be generated by an optimal page replacement policy?

(a) 5
(b) 4
(c) 6
(d) 3

- ○ A
- ○ B
- ◉ C
- ○ D

*

Virtual system swapping
(a) allocates all the memory to one program
(b) pages working set pages in and out as group
(c) is never efficient as normal paging
(d) is used only on systems that are thrashing.

- ○ A
- ○ B
- ○ C
- ◉ D

*

Match the following lists with disadvantage of different scheduling algorithm:

Disadvantage	Scheduling
a. Short jobs can be stuck behind long jobs	p. RR
b. High turnaround time for equal length jobs	q. FCFS
c. long jobs are starved	r. SRTF
d. Prediction of future	s. SJF

(a) a-q, b-s, c-p, d=r
(b) a-r, b-p, c-s, d=q
(c) a-q, b-p, c-s, d=r
(d) a-s, b-r, c-q, d=p

- ○ A
- ○ B
- ◉ C
- ○ D

*

A system has 3 page frames in main memory and uses LRU replacement policy with the following reference string. What is the state of main memory(the pages existing) after the 5th page fault?
1223413121

(a) 324
(b) 124
(c) 234
(d) 321
(e) None of the above

- ○ A
- ◉ B
- ○ C
- ○ D
- ○ E

*

Consider the following three processes that arrive in a system at the specified times, along with the duration of their CPU bursts. Process P1 arrives at time t=0, and has a CPU burst of 6 time units. P2 arrives at t=2, and has a CPU burst of 2 units. P3 arrives at t=3, and has a CPU burst of 5 units. Assume that the processes execute only once for the duration of their CPU burst, and terminate immediately. Calculate the time of completion of the three processes under each of the following scheduling policies. For each policy, you must state the completion time of all three processes, P1, P2, and P3. Assume there are no other processes in the scheduler's queue. For the pre-emptive policies, assume that a running process can be immediately pre-empted as soon as the new process arrives (if the policy should decide to pre-empt).
(i) Shortest Remaining Time First (pre-emptive)
(ii) Round robin (pre-emptive) with a time slice of (atmost) 2 units per process
(a) SRTF: P2 at 4, P3 at 13, P1 at 8, RR: P2 at 4, P3 at 13, P1 at 10
(b) SRTF: P2 at 5, P3 at 7, P1 at 15, RR: P2 at 7, P3 at 12, P1 at 15
(c) SRTF: P2 at 6, P3 at 7, P1 at 15, RR: P2 at 9, P3 at 10, P1 at 15
(d) SRTF: P2 at 4, P3 at 7, P1 at 15, RR: P2 at 7, P3 at 10, P1 at 15

- (●) A
- ( ) B
- ( ) C
- ( ) D

*

Resources are managed
(a) with a processor equally
(b) by only one processor
(c) by sophisticated locking mechanisms
(d) more easily with multiple processors

- ( ) A
- ( ) B
- (●) C
- ( ) D

*

malloc, new etc memory allocations use
(a) Per-process memory
(b) May call OS only if per-process memory is over or exhausted
(c) a & b
(d) None

- ○ A
- ○ B
- ◉ C
- ○ D

*

A system with a 32-bit virtual address. Each page size is 16 KB words. Each table entry takes 4 bytes. What is the size of the page table?
(a) 1 MB
(b) 2 MB
(c) 4 MB
(d) 8 MB

- ◉ A
- ○ B
- ○ C
- ○ D

*

In a multi-user operating system, 20 requests are made to use a particular recourse per hour, on an average. the probability that no requests are made in 45 min. is

(a) e^ -15
(b) e^ -5
(c) 1-e^ -5
(d) 1- e^ -10

- (●) A
- ( ) B
- ( ) C
- ( ) D

*

In a round robin scheduling ***'p'*** represents the time of context switching, ***''t*** represents the round robin time quantum and ***'r'*** represents the average time a process runs before blocking on I/O.
If ***p < t < r*** then CPU efficiency is,

(a) t/(r+p)
(b) t/ (t+p)
(c) r/(r+p)
(d) tr/(r+p)

- ( ) A
- (●) B
- ( ) C
- ( ) D

*

_____ is used to achieve IPC over network
(a) semaphore
(b) monitor
(c) message passing
(d) interrupt

- [ ] A
- [ ] B
- [x] C
- [ ] D

*

If there are 32 segments, each of size 2Kbyte, then the logical address should have
(a) 13 bits
(b) 14 bits
(c) 15 bits
(d) 16 bits

- [ ] A
- [ ] B
- [ ] C
- [x] D

*

Priority inversion between two processes, one with high priority and the other with low priority, that share a critical section, will cause the following problem:

(a) High priority process executes before low priority process and finishes faster then it should
(b) Low priority process executes before high priority process and finishes faster then it should
(c) High priority process waits for low priority process(that holds the semaphore) to finish, but the low priority process never gets scheduled
(d) Low priority process changes priority temporary to the priority of the high priority process

- ○ A
- ◉ B
- ○ C
- ○ D

*

Consider the following set of processes, with the length of CPU burst time in milliseconds.

Processes	*Arrival time*	*Burst time*
p1	*0*	*3*
p2	*1*	*1*
p3	*3*	*3*
p4	*4*	*x*

What must be the value of 'x', such that the average waiting time is 1 ms using SRTF. (x>=0)

(a) x = 1.5
(b) x = 1
(c) x= 2
(d) x= 0

- ○ A
- ○ B
- ◉ C
- ○ D

*

Here, lower the priority number, higher is the priority. As per the non-pre-emptive priority scheduling, the processes will be executed. And find out the average turnaround time.

Process Id	***Arrival Time***	***Burst Time***	***Priority Number***
P1	0	5	1
P2	1	3	3
P3	2	4	5
P4	4	3	4

(a) 9 milliseconds
(b) 7.4 milliseconds
(c) 6.5 milliseconds
(d) 8 milliseconds

- ○ A
- ○ B
- ○ C
- ◉ D

*

Consider following heap JOB1-50,FREE-150,JOB2-300,FREE-350,JOB3-600 the sequence of requests for block of sizes 300,25,125,50 can be satisfied if we use
(a) either first fit or best fit policy
(b) first fit ,but not best fit
(c) best fit ,but not first fit
(d) none of these

- ○ A
- ◉ B
- ○ C
- ○ D

*

A system has 64 virtual pages mapping into 16 physical frames in the following equation: Frame number = page number % 16. Each page has 1K words. If the virtual address is 1010101000111101, the physical address would be:

(a) 11001000111101
(b) 10101010001111
(c) 10101000111101
(d) None of the above

- ○ A
- ○ B
- ◉ C
- ○ D

*

For a simple system running a single process, the size of physical frames and logical pages is 16 bytes. The main memory can hold 3 physical frames. The virtual addresses of the process are 6 bits in size. For the reference string: 0, 1, 20, 2, 20, 21, 32, 31, 0, 60, 0, 0, 16, 1, 17, 18, 32, 31, 0, 61(6-bit addresses are shown in decimal here) calculate the number of page faults for (a) FIFO (b) LRU page replacement algorithm. Assume that the physical frames in RAM are initially empty and do not map to any logical page.
(a) 6, 8
(b) 8 , 6
(c) 6 , 6
(d) 7 , 8

- ○ A
- ◉ B
- ○ C
- ○ D

*

Which statement about segmentation is false?
(a) There are many linear address spaces
(b) The total address space can exceed the size of physical memory
(c) Sharing of procedures between users is facilitated
(d) None of the above

- ○ A
- ○ B
- ○ C
- ◉ D

*

Which for the following sequence is an optimal non pre-emptive scheduling sequence for the below given processes?

Processes	***Arrival Time(ms)***	***Burst Time (ms)***
X	0	6
Y	0	1
Z	0	4

(a) (Y, Z, X)
(b) (X, Y, Z)
(c) (Y, X, Z)
(d) (Z, Y, X)

- ◉ A
- ○ B
- ○ C
- ○ D

*

The Time elapsed between the job submission and it's completion is_____
(a) response time
(b) waiting time
(c) terminal response time
(d) turnaround time

- ○ A
- ○ B
- ○ C
- ◉ D

*

_____ is created by the operating system when a process starts executing for each of the recognized and declared threads within the process
(a) TCB
(b) PCB
(c) DCB
(d) Process state

- ○ A
- ◉ B
- ○ C
- ○ D

*

When an interrupt occurs, an OS
(a) Ignores the interrupt
(b) Always changes state of interrupted process to be blocked and schedules another process
(c) Always resumes execution of interrupted process after processing the interrupt
(d) May change state of interrupt process to be blocked and schedule another process

- ○ A
- ○ B
- ○ C
- ◉ D

*

For the time-sharing systems, the primary requirement is to provide reasonably good response time and to share system resources equitably. Considering such situations, most suitable scheduling algorithm is _____.

(a) Round Robin Scheduling
(b) Shortest Remaining Time Next (SRTN) Scheduling
(c) Priority Based Pre-emptive Scheduling
(d) First come First Serve

- ◉ A
- ○ B
- ○ C
- ○ D

*

Which of the following statements is false?
(a) A small page size causes large page tables
(b) Internal fragmentation is increased with small pages
(c) A large size causes instructions and data that will not be referenced brought into primary storage
(d) I/O transfers are more efficient with large pages

- ○ A
- ◉ B
- ○ C
- ○ D

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