

## **CS604 - Operating Systems FAQs By www.virtualians.pk**

**Question:** Is there any concrete reason behind selecting Linux as a major OS for study in this course instead of Windows because most of us has windows already installed and we are also familiar with it, kindly explain

**Answer:** Yes. Linux is open source. You have complete code of Linux operating system whereas in Windows you do not have the privilege to see its code. While programming in C in the Linux environment you get a better understanding of the OS concepts.

**Question:** i have purchased a Fedora Core 2 redhat 11 for linux OS which consists of 4 CDs, is it ok and tell me is there any specific system requirements and like that etc, kindly explain.

**Answer:** Yes it is fine. I think you will find the system requirements on the CD cover. I think that 512 RAM and 1 plus Gb processor will be OK

**Question:** Please provide us the link of Virtual Machine for which I would be able to install both Operating System Window XP and Linux.

**Answer:** You can download the VMware from the following link:  
<http://www.vmware.com/download/> As far as Linux is concerned, try to get the cd of Linux from the market as it is not easy to download complete Linux from internet. But if you have fast internet then you may try

**Question:** Tell me the name of recommended book or reference books for this subject.

**Answer:** Operating Systems by Silberschatz is the text book. For reference, consult Operating System by Tannenbaum Moreover consult CS604 handouts.

**Question:** kindly explain a major difference between hard & soft real time systems with the help of an example.

**Answer:** Real time systems need to provide the desired output in the given amount of time. Hard real time systems are those that guarantees the critical tasks should be completed within specified time. For example you have a system of ECG where a patients pulse is seen on the monitor screen. The working of ECG is critical and hence it must show the desired output in the given amount of time and delay in getting the output may lead to serious consequences

therefore it should be guaranteed that the machine should be able to provide the output in specific amount of time. Whereas Soft real time system are less restrictive. Though getting the output in these systems are also important but not so critical as compared to hard real time systems. Here one task can get priority over other task. For example if you are using a real time system in a washing machine then the output of the system ( e.g buzzer alarm) is not so critical and it may happen that this system allows washing machine to stop first and then rung the Buzzer instead of normal flow of ringing the Buzzer before stopping the machine.

Question: What is an efficient operating system, what is the main parameter to judge the efficiency of an OS?

Answer: We can call an OS to be efficient if it can perform all the necessary functions like resource management, memory management, CPU and process scheduling etc. in an efficient manner.

Question: what was the main reason that user could not interact with a multi programmed batched computer system? Was it only due to slow response?

Answer: The main reason is that the operating system design did not allow the user to interact with the running jobs. Later Kernel were designed in such a way that they provided the facility of interactivity along with multiprogramming.

Question: Historically, single user systems were evolved before or after time sharing systems?

Answer: Single user systems were invented before time sharing systems.

Question: Kindly give an example of a signal ?

Answer: A signal is an event to get the attention of a process. . A signal can be send from one process to an other process. For example if a file exceeds limits then the process may be asked to produce the output until the file size is increased. Similarly you can use ctr+z command on Linux shell to stop the running process.

Question: Is this necessary that all the privileged instructions reside in kernel area of memory.

Answer: Yes. Privileged instructions can be used by Application programmer with the help of system calls.

Question: Explain something about 32bit OS and 64bit OS as we hear lots of these in our daily life just like vista is 64 bit software and like that, what is the difference there and we need special hardware for these OS

Answer: Computer systems stores and process data in the form of bits; 0 and 1. A 32 bit means the size of the word is 32 bit and processor can present the data in 32 bits and similar is the case for 64 bits. So this is actually the processor's capability to store and manipulate the data in the form of 32 bit or 64 bit. Operating systems are then designed according to the processors and hence named as for example , VISTA is 64 bit. It means that VISTA can run on processors that are 64 bit processors.

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Question: What are Non-privileged instructions?

Answer: The instructions that are not related to the hardware operations are termed as non-privileged instructions. For example manipulating the user's data.

Question: What is the difference between MEMORY SPACE and ADDRESS SPACE?

Answer: They are both same thing by meaning but in lecture # 3 handouts address space refers to the region in the memory that a process is allowed to access whereas memory space is region of the memory where operating system resides.

Question: What is the difference between USER PROCESS and SYSTEM PROCESS?

Answer: User process is the one created by the user while the process created by the Operating System is called System process.

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Question: What is the difference between PROCESS SYNCHRONIZATION and PROCESS COMMUNICATION?

Answer: Process Synchronization means that process working should be synchronized so that processes should finish their working in a desired order so that they can contribute in producing the correct result whereas Process communication is the communication of processes between them known as inter process communication.

Question: What is DEADLOCK?

Answer: Deadlock is a condition in the system in which a process A is waiting for the resources held by process B and process B is waiting for the resources held by process A

Question: How STACK is defined and maintained in main memory?

Answer: A stack is created in the main memory so as to keep the necessary output of the processes when required.

Question: What is FILE SYSTEM? What is the difference between FAT32 and NTFS file system? LINUX use which FILE SYSTEM?

Answer: File System is a system of managing the files in the computer system. FAT, FAT 32, NTFS are used in Windows operating system. They are different with respect to performance, storage capacity of files etc. Linux uses ext2 file system.

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Question: What is the difference between BUFFERING and CASHING?

Answer: Buffer is a temporary memory for holding a specific data (input or output) for some period of time. Some devices also have buffer with them for example a keyboard, you may have experienced that sometimes you type alphabet letters but they do not readily display on the screen and stay in the buffer until the CPU becomes free to process it. Cache is a fast memory used for readily accessing the data.

Question: What is the difference between BOURNE SHELL and DOS?

Answer: DOS is Disk Operating System whereas Shell is a terminal (like a command prompt) in Linux/Unix.

Question: What is the difference between LIBRARY CALL and SYSTEM CALL?

Answer: Library calls are made by library functions which are defined in the header files of the library whereas System calls are defined by the operating system and provide an interface to the application programmers to use the services of the Kernel.

Question: What is the difference between VIRTUAL MACHINE and VIRTUAL MEMORY?

Answer: A virtual machine is actually a software that gives you the functionality of a complete machine. Means that you can install complete Os inside a virtual machine. VMWare is a famous virtual machine. Virtual memory is a memory management technique that you will study in coming lectures. It is pre-mature to explain virtual memory here in detail.

Question: ~/courses/cs604. In this path what ~ represent? Please explain

Answer: ~ is used to represent HOME directory

Question: Which software will be used during this course ?

Answer: Insha Allah we will be using Linux Operating System in this course. So you need to install this OS as soon as possible as you will be given assignments that you will have to do in C language using Linux environment.

Question: In DOS if we want to enter into a directory we write "cd dirName" and same is the case in Linux. In MS-DOS if we want to go to the beginning of the current drive then we type "cd\". In Linux we just type "cd" to go to the home directory. In DOS we can go to the parent

directory of the current directory by type command "cd.." but please, inform that how can we go to the parent directory of the current directory in Linux.

Answer: You can come back to the home directory by cd ~ command.

Question: Explain significant difference between process & program.

Answer: We usually say that a program in execution is called a process. Program is actually sequence of well defined code instructions. explain significant difference between process & program.

Question: Where do I practice the Linuxands such as ls, mkdir etc.

Answer: Open the Terminal and practice these commands at its prompt.

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Question: What are the contents of Swapper directory in Unix tree hierarchy?

Answer: Swap space is a temporary memory location. Swap space is used when physical memory is not sufficient to hold all the running processes. If the system needs more memory resources and the physical memory is full, inactive pages in memory are moved to the swap space. So usually swap space holds the contents of the main memory temporarily.

Question: When a process is doing IO, even then CPU is doing all the work i.e CPU has to execute the instructions for IO . So how we differentiate between IO bound and CPU bound process?

Answer: Actually, while working on the computer, we get the feeling that I/O operations as well as CPU operations are running in parallel. We get this feeling because of excellent processor and time sharing algorithms. Otherwise a single CPU can do only I/O burst or CPU burst at a given time.

Question: At the end of lecture 6, in the last few minutes the professor says that after the fork() system call the parent and the child share the following: • Environment • Open file descriptor table • Signal handling settings • Nice value • Current working directory • Root directory • File mode creation mask (umask) The professor says that the Open file

descriptor will be explained later but he did not say anything about the Nice Value and File Mode creation mask. Please explain the Nice Value and File Mode creation mask in the context of fork() system call.

Answer: Nice value is a number that influence the property of the process. If the nice value is high, it makes the process to run at lower priority and if the value of nice is lower, the process runs at higher priority. The file mode creation mask (often called the umask) determines the default permissions for any file created by the process. For example, a file created by the create command has the permissions specified by the umask unless the create command specifies explicit permissions. (Ref: <http://www.mksoftware.com/docs/man1/umask.1.asp>)

Question: Last few lines of the handouts of lecture 6 say that "Child has its own copy of parent's file descriptors." What does it mean? Please explain

Answer: It means that the file descriptor of the child is different from that of the parent and child maintain its own file descriptor.

Question: In Unix/Linux process tree, each does each process corresponds to a directory? Suppose I am in /home/aamir directory; and here I create an other directory test ie "mkdir /home/aamir test", does it mean a new process named "test" is created?

Answer: If you create a directory or a file then the process of creation of that directory or file could be termed as a process while directory 'test' is not a process itself.

Question: What is difference between a logical and physical resource, could you please give one example of each?

Answer: Example of Physical resource is I/O devices, CPU etc. Whereas example of Logical resource are processes, shared memory or variables.

Question: Could you please give a short example where a parent passes resources to its child process?

Answer: When a child process is created through fork system call, it may happen that child manipulate some data (e.g. some calculation) and pass its result to the parent process and same could be case from parent to child. Similarly both processes can interact with each other through shared variable as well.

Question: What is FILE MODE CREATION MASK?

Answer: The file mode creation mask (often called the umask) determines the default permissions for any file created by the process. For example, a file created by the create command has the permissions specified by the umask unless the create command specifies explicit permissions. (Ref: <http://www.mksssoftware.com/docs/man1/umask.1.asp>)

Question: What is SIGNAL HANDLING SETTING?

Answer: As you have read that when there is need to invoke a signal, there are multiple options. Whether to execute Kernel defined default action or to take programmer defined action or just simply ignore it. So this setting is Signal Handling Setting.

Question: What is FILE DESCRIPTOR TABLE? What type of information it contain?

Answer: A File Descriptor table is created for each process. It is used to locate the relevant data of that process on the disk and is indexed by an integer value called as File Descriptor. Basically, each entry of file descriptor table contains a flag and a pointer. Pointer helps in traversing the file and inode tables.

Question: What is the difference between PROCESS MEMORY SPACE and PROCESS ADDRESS SPACE?

Answer: Both are same thing.

Question: Why RETURN CODE for the FORK system call is ZERO for the CHILD PROCESS?

Answer: The system call fork ( ) is written (in Kernel) in such a way that when it executes successfully, it returns 0 to the child process and process id of the child to the Parent process.

Question: Give some examples of LOGICAL RESOURCES and PHYSICAL RESOURCES?

Answer: Logical resource can be some variable or shared memory or file etc. whereas physical resources are hard disc, keyboard etc

Question: What is MEMORY IMAGE?

Answer: Memory image here means that the position/ status of the memory (number of variables, their names and operations etc) seen by a Parent process is also visible to a Child



process because child process is the copy of the parent process. After execution of Fork system call, a child is created which is the exact copy (memory image) of its parent. Therefore after formation of these two separate processes, one of the process execute `execvp` system call, this system call destroy the memory image of the process which calls this `execvp` system call. This makes both the processes to further proceeds their own execution independently.

Question: What is SWAP SPACE?

Answer: Depending upon the process scheduling algorithm (as in medium term schedulers), some process may be swap out of main memory on hard disc for some time and then brought back into the main memory. So the space on hard disc where these processes are kept is called Swap Space.

Question: Why the long-term scheduler must select a good mix of I/O bound and CPU BOUND JOBS?

Answer: Because selecting a good mix of I/O bound and CPU bound jobs will enable the CPU to schedule the tasks equally between I/O bound and CPU bound processed. If there are more CPU hungry processed then I/O bound processes may find processor lesser amount of time as similarly vice-versa for I/O hungry processes. Therefore selecting a good mix of both type of processes will enable to optimize the functionality of CPU and system at large.

Question: What is the difference between I/O BOUNDS JOB and CPU BOUNDS JOB?

Answer: The jobs or processes which requires more I/O operations like typing on text editors are called as I/O bound processes while the processes in which intense calculations are involved and CPU has to give maximum time to perform those calculations are called CPU bound jobs/ processes.

Question: What is CPU BURST?

Answer: CPU burst is the time taken by the process to use the CPU.

Question: What is the difference between THREAD and PROCESS?

Answer: A thread is created by a process. Existence of a thread is dependent on the existence of a process. It is sometimes called as Light weight process. But threads execute within the address space of the process. A thread has a thread id, program counter, register set.

A thread can also communicate with other threads of the same process whereas a process can exist independently.

Question: What is the difference between USER PROCESS and SYSTEM PROCESS?

Answer: The processes run by the user are called User processes while the processes performed by the Kernel are called as System processes.

Question: "In Indirect Communication, two processes can only communicate if they mail box." Sharing a mail box is like sharing memory. I am bit confused that the main theme of IPC is to avoid sharing memory for process communication. But here the technique is based on sharing the mail box?

Answer: No, we can not say that basic goal of IPC is to avoid sharing. Its main goal is to provide the facility of communication between the processes. And there are ways to achieve IPC which includes both direct as well as indirect communication. Mail box are different in a way that the sender do not specify the address of the receiver. The receiving process itself have to contact the mailbox to get its message. So this is basically a way of indirect communication.

Question: What is the concept of port in Indirect Communication?

Answer: Ports are used in IPC through sockets because network is involved and communication takes place through sockets.

Question: Pls refer Indirect Communication:-"Allow a link to be associated with at most two processes." Does it mean that allow only two processes to share a mail box?

Answer: In direct communication as the sender specify the name of the recipient therefore the link established between only two processes. This is the basic property of Direct communication.

Question: Why can't we use only one file descriptor in case of pipe? Using it we can access the pipe for read operation and for write operation ?

Answer: OS provides standard file descriptors, 0 and 1 for reading and writing. Therefore we are bounded by the operating system to use it that way.

Question: Can we say that a pipe is a sort of shared memory but defined in Kernel area of memory?

Answer: PIPES are created by an API in which Kernel establishes a communication channel between related processes.

Question: Can we say that the concurrent cooperating process is a thread?

Answer: Not necessarily. Concurrent cooperating processes can also be independent processes like client and server processes.

Question: Can 64bit OS can run on a 32bit processor and 32bit OS can run on a 64bit processor?

Answer: A 32 bit OS can run on both 32-bit and 64-bit processor. A 64 bit OS can not run on 32 bit machine.

Question: explain the difference between multi-programmed system and time sharing system.

Answer: Those systems that can run multiple programs simultaneously are called Mutli-programmed systems and to support multi-programming and concurrent execution of processes, OS schedule the CPU in such a way that it runs all the programs by sharing CPU between them and hence help in completing the tasks of all the programs simultaneously. These systems are known as time sharing systems.

Question: What is BOUNDED BUFFER?

Answer: Bounded buffer is fixed sized memory, whereas buffer itself is temporary memory location. You will study a classical problem known as Bounded Buffer problem in coming lectures.

Question: What is function of UNLINK() statement?

Answer: unlink is a system call and is used to delete a file.

Question: What is the difference between FILEDESCRIPTOR and BUFFER?

**Answer:** Bounded Buffer is a buffer of fixed length. A buffer is a temporary storage space usually attached with input and output devices. File Descriptor is an integer assigned to a per process file descriptor table created against an opened file. File descriptor is then used in different system calls like read, write, etc.

**Question:** What is the difference between NON BLOCKING RECEIVER and NON BLOCKING SEND?

**Answer:** In non blocking send, sending process sends the message and resumes operations. In non blocking receive, the receiver receives either a valid message or a null.

**Question:** What is MAILBOX? How to implement MAILBOX?

**Answer:** Mail box is a way of indirect inter process communication. In mail box, we do not send the message directly to the recipient instead we send a message to a 'mail box' from where the receiver selects its appropriate message

**Question:** What is the difference between SYMMETRIC and DIRECT process communication?

**Answer:** In Direct communication, the sender directly send the message to the receiver. Similar sized messages are passed from the sender to the receiver is symmetric communication through message passing.

**Question:** What is the difference between `execvp()` and `wait()` systems call?

**Answer:** `execvp ()` system call is used after `fork` system call by any process (parent or child). This system call will replace the calling process's memory space with a new program. `wait` system call suspends the calling program until one of its immediate children terminates.

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**Question:** What is the difference between Parent () process and `init()` process?

**Answer:** A process which creates a child is called as Parent process while a process which take care of child's return value in case of parent's death (exit from the system) is called init process.

**Question:** What is the difference between BATCH SYSTEMS and MULTI PROGRAMMED SYSTEMS?

**Answer:** In Batch system, a single job is executed at a time. These systems can not interact with the user while performing a particular task. Multi-programmed systems are those which can perform multiple programs simultaneously. They are usually interactive and time sharing system.

**Question:** What is the difference between Statically linked and Dynamically Linked executable files?

**Answer:** When procedures /libraries are linked with the program at compile time, then this linkage is called Statically linkage while are linked at run time, then its called as Dynamically linkage.

**Question:** Give an example of SIBBILING PROCESS?

**Answer:** Sibling process with respect to pipe system call means that the related processes can communicate through pipe system call. One is parent child relationship and the other is brother-brother (sibling) relationship. For example a parent has created two children A and B. Then these children A and B are siblings and hence can communicate through pipe system call.

**Question:** What is the difference between FIFO and PIPE?

**Answer:** PIPES are created between related processes. For example a pipe can be created between a parent and a child process. Whereas FIFO can be used for communication between unrelated processes. (Unrelated processes are those that can exist independently)

**Question:** What is NICE VALUE?

**Answer:** Nice value is a property of a process that helps in determining its priority in the system. Consult the following link to know more about the nice value:  
<http://linux.die.net/man/3/nice>



Question: What is PROCESS IMAGE?

Answer: The process image means that when fork system call is executed, a child process is created and that child process is exact memory image of the parent process.

Question: How to practice the command fork() and wait() in Linux?

Answer: Fork and Wait system calls are used inside C programs. For that I will suggest you to practice the examples given in lectures and handouts

Question: How can we write and compile a C program in Linux?

Answer: Write the code in a text file and save it with .c extension. Then open the terminal and go to that location where you have saved that file(with the help of cd command). After that you can write gcc fileName.c and then press enter. If it runs successfully, it will not show any error otherwise correct the highlighted error. Then you have to type ./a.out, this will run the program. I will suggest you to first compile and run a small program. (just print "Assalam O Alaikum" through printf)

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Question: What are the advantages of having multiple threads per process instead of single thread per process?

Answer: Having multiple threads enable to accomplish multiple tasks using the same process space. As well as this helps in concurrent execution of the several tasks that increases efficiency of the system. For example, you use MS-WORD; in this single application several processes(you may call them threads) are working concurrently. You are typing as well as spelling check and grammar check is also being done at the same time.

Question: A 64 bit OS can not run on 32 bit machine. Can you explain exactly why is it not possible.

Answer: The underline hardware architecture has been designed in such a way that a 32 bit machine do not allow 64 bit OS because the registers in 32 bit machine do not support the result obtained from 64 bit processing OS.

Question: How hidden files are represented in LINUX?

Answer: Hidden files can be displayed using ls -a command.

Question: What is the functionality of FILE SYSTEMS? For example NTFS and FAT?

Answer: File System is a system of organizing file on storage medium like disc. File system is maintained by the operating system. FAT, NTFS are examples of file systems. You will study the file system in detail in later chapters.

Question: I had read in the handouts that to run compiled program a.out command is used but if there are multiple program then do all of them will be stored in a.out file? And how can we run a particular program out of them

Answer: When you compile a program using gcc command and do not give the name of the .exe file explicitly then a.out file is created. You can run that program by ./a.out command . A better way is to use the gcc command in the following way: \$ gcc programName.c -o MyProgram the above line will compile a program and make an exe file with the name MyProgram. now you can run the exe in the following way \$ ./MyProgram

Question: Wat is the difference between the process and the jobs, I mean "ps" and "jobs" command.

Answer: You can use "jobs" command to show the status of the background or suspended process on your terminal screen. "ps" command will display the status of the all the current processes. There are some options like -u, -l, -e that can be used with ps command. You can see their detail in handouts.

Question: Explain how to create a C file on Linux?

Answer: You can create C file by just opening a simple file and saving it with .c extension. Write C program in it. Compile and run this program using gcc command (as explained in handouts)

Question: Is it possible that those C programs that we can compile and run in Linux environment can also be runnable in Windows, if yes then which compiler we have to install to compile the code in handouts.

Answer: You can not compile them using Turbo C or Borland C because they need support of Linux environment. The system calls that you have studied in this course is supported by Linux Kernel. But using Cygwin, you can be able to compile these C programs even in Windows. For the detail of Cygwin, consult the yesterday's announcement on Announcement Page.

Question: What are the differences between TRAP and INTERRUPTS?

Answer: Interrupt is a signal generated by a hardware device (like keyboard) to get the CPU attention to process its request. Trap is a type of exception generated when an illegal operation is performed. For example if you try to divide a number by zero.

Question: What is SPOOLING?

Answer: Spooling is to send files to some device or program that puts them in a queue for later processing, e.g. controlling output of jobs to a printer, other peripherals or input devices; used when two devices or pieces of software have different speeds. (Source: <http://www.gregvogl.net/courses/os/glossary.htm>)

Question: Is it possible that a certain given time windows automatically shuts down and startups automatically at a give time, if yes then how.

Answer: Yes you can do it with shutdown command in Windows. Open your command prompt and explore the command shutdown. By writing shutdown and pressing enter key you will come to know all possible functionality of shutdown command in detail. Here you will find an option where specifying the time, you system will shutdown at the specified time. There are also some software available that can help you in performing this task

Question: What is BURST TIME and WAITING TIME?

**Answer:** Burst time is the time taken by the CPU to run a process. Waiting time is the time for which a process waits to acquire the CPU. For example when time quantum expires or when a process is preempted, the process is taken from the CPU for some time and then given back to the CPU. This time for which a process remains away from the CPU due to some reason (as stated above) is the waiting time of that process.

**Question:** What is CONVOY EFFECT?

**Answer:** Convoy effect is the result of mechanism in which some one has to follow an order like the movement of a convoy. In FCFS, a process whether shorter or smaller has to follow a queue to be assigned to a CPU. That's why FCFS exhibits convoy effect.

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**Question:** What is the difference between THROUGHPUT and TURNAROUND TIME?

**Answer:** Time around time is the interval between time of submission and time of completion of a process. With the help of scheduling we want to minimize the turn around time. The number of processes completed per unit time is called throughput of the system. One of the benefits of scheduling is that maximum processes can be completed at a given time. This is related to maximizing the CPU utilization.

**Question:** What is the difference between SURE KILL and KILL command?

**Answer:** A process can be terminated by kill command. sure kill command is used for special processes which are programmed in such a way that they have the ability to ignore the signal sent to them. To terminate these processes sure kill command is used.

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Question: What is the difference between suspended process and background process?

Answer: Background processes are those that usually do not require input/ output from the user like server processes. Therefore we can run them as background as we do not have to interact with them and keep on doing our normal function. Try to implement client-server code given under FIFOs and then try bg command with server process. The suspended processes are those that get suspend their execution and can be invoked again when required.

Question: What happens to process when we make it to background? It is suspended?

Answer: No, it is not suspended. Background processes keep on running in the background. in BG processes we do not have direct interaction with those processes but they keep on running in the background whereas suspended processes are concerned, their execution is suspended until invoked later.

Question: What is the difference between JOB ID and PROCESS ID?

Answer: Both are same. The term job is often use for batch systems.

Question: What is the difference between exit(0) and exit(1) statements?

Answer: exit (0) is used for successful termination of the program and exit(1) is used if the program has encountered an error and needs to be terminate.

Question: I have downloaded and installed it but it is simply giving me command prompt like interface where I can run my commands. But I don't know where to write my c program in Cygwin??

Answer: You have to write your C program in simple text file. Save that file with .c extension. Then go to that location where this file is saved with the help of cygwin (using cd command) and compile (using gcc command) and run the C program.



Question: Turn around time of a process = waiting time of a process + process CPU bursts  
Is it right?

Answer: Turnaround time is the total time between the submission time and completion time of process. After submission of a process, a process undergoes several stages like waiting, running, doing I/O so turnaround time is the sum of all the time these intermediate stages take.

Question: Why does the critical section problem or synchronization problem do not occurs in threads as they also shared the memory of one process, and if yes then what do we do to avoid this.

Answer: Yes, Thread also face the same problem of synchronization. As they share the process address space therefore threads can be synchronized using those techniques that are applied when processes share the same memory like semaphores, monitors etc.

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Answer: Yes, Thread also face the same problem of synchronization. As they share the process address space therefore threads can be synchronized using those techniques that are applied when processes share the same memory like semaphores, monitors etc.

Question: What is meant by Serialization?

Answer: Serialization means to execute the code statement in a sequence.

Question: Where we will have to place wait () and signal () operations in the code? And why we place them there?

Answer: Wait and signal are actually used to implement synchronization through semaphores. I will recommend you to first hear the lecture related to semaphore then you will be in a good position to understand the concept of wait and signal operations.

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Question: How Semaphores don't be a good solution?

Answer: The problem with semaphore arises when the wait and signal operations are misplaced in the code. And misplaced wait and signal can even cause deadlocks

Question: What is meant by Synchronization? Also process synchronization?

Answer: Synchronization is a process of executing the program in such a way that it should access shared data/ code sequentially.

Question: I am a bit confused and mixing the concepts of Critical section, process synchronization & concurrent cooperating processes as these 3 terms are used interchangeably . I know that there is some difference in between but I think the implementation solution is the same that's why I am mixing the concept, kindly clear this ambiguity.

Answer: Critical section is a piece of code which is shared between processes. It means that several processes can access that code at the same time. But we do not want that shared code be accessed by every process at any time. Infact we want to synchronize their execution i.e. when one process is executing a shared piece of code then no other process should be able to modify it otherwise it could result in incorrect result.. And concurrent processes are those processes that can run simultaneously. For example if you create a child process using fork system call then a child process is created. This child and parent process can run simultaneously. This simultaneous running processes are called concurrent processes.

Question: What is the similarity OR difference among • Bounded-Buffer Problem • Readers and Writers Problem • Dining Philosophers Problem

Answer: There is no similarity or difference between these. These are all independent classical problems to solve the critical sections. Actually when we have to test an algorithm related to critical section then firstly we test that algorithm on these classical problems.

Question: What is the reason for SYSTEM HANG?

Answer: System can hang due to several reasons. System usually hang due to insufficient resources. For example you have requested the OS to load a program but the system does not have required memory to load.

Question: What is reason for SYSTEM CRASH?

Answer: System crash due to some defect in the application. Some bugs are not visible unless a specific condition is met e.g. system may fail at a particular input or at a particular date.

Question: Sir, if I want to mount a CDROM/USB/FLOPPY into a directory named DRVS which I have created in home directory or root directory then what will be the mount command for that, kindly explain

Answer: Try to mount with the help of following link:  
<http://publib.boulder.ibm.com/infocenter/db2luw/v8/index.jsp?topic=/com.ibm.db2.udb.doc/start/t0006753.htm>