ASSIGNMENT

OS

SUBMITTED BY HEMANT SHARMA

CSA57

Ans.1:

1. There are Many Functions those are Performed by the OS But the Main Goal of Operating System is to Provide the Interface between the user and the hardware.
2. Operating System Manages all the Resources those are Attached to the System means all the Resource like Memory and processor and all the Input output Devices those are Attached to the System are Known as the Resources of the computer System and the Operating system will Manage all the Resources of the System. The Operating System will identify at which Time the CPU will perform which Operation and in which Time the Memory is used by which Programs. And which input devices will respond to which Request of the user means When the Input and Output Devices are used by the which Programs. So this will manage all the Resources those are attached to the Computer System.

Ans.2:

The CPU is in a halt state. That is, it stops fetching instructions and waits for an interrupt. In normal operation, CPUs continually fetch and execute new instructions, usually from memory locations, with the occasional jump to a new location. Interrupts cause the CPU to save its state, jump to a different location and start doing something completely different. In a halt state, the CPU responds to interrupts but doesn't do anything else.

Ans 3:

int main() // CPU execution

{

Int I,j; // CPU execution

Scanf(“%d”,&i); // I/P execution

for(j=0;j<I;j++) // CPU execution

{

Sum=j+I; // CPU execution

}

printf(“%d”,Sum); // O/P execution

exit(0); // CPU execution

}

Ans 4:

**Multiprogramming** - This term is used in the context of batch systems. You've got several programs in main memory concurrently. The CPU schedules a time for each one. i.e. submitting multiple jobs and all of them are loaded into memory and executed according to a scheduling algorithm. Common batch system scheduling algorithms include: First-Come-First-Served, Shortest-Job-First, Shortest-Remaining-Time-Next

**Multitasking** - This is basically multiprogramming in the context of a single-user interactive environment, in which the OS switches between several programs in main memory so as to give the illusion that several are running at once. Common scheduling algorithms used for multitasking are: Round-Robin, Priority Scheduling (multiple queues), Shortest-Process-Next.

**Multiprocessing-** is like the OS handling the different jobs in main memory in such a way that it gives its time to each and every job when other is busy for some task such as I/O operation. So as long as at least one job needs to execute, the cpu never sit idle. and here it is automatically handled by the OS, without user interaction with computer.

Ans 5:

Program is an executable file containing the set of instructions written to perform a specific job on your computer. For example, notepad.exe is an executable file containing the set of instructions which help us to edit and print the text files.

Programs are not stored on the primary memory in your computer. They are stored on a disk or a secondary memory on your computer. They are read into the primary memory and executed by the kernel. A program is sometimes referred as passive entity as it resides on a secondary memory.

Process is an executing instance of a program. For example, when you double click on a notepad icon on your computer, a process is started that will run the notepad program.

A process is sometimes referred as active entity as it resides on the primary memory and leaves the memory if the system is rebooted. Several processes may related to same program. For example, you can run multiple instances of a notepad program. Each instance is referred as a process.

Ans 6:

New State- Secondary memory.

Ready State- Main memory.

Run State- Main memory.

Block State- Main memory.

Terminate State- Main memory.

Suspend Ready State- Main memory.

Suspend Block State- Secondary memory

Ans 7:

A context switch is a procedure that a computer's CPU (central processing unit) follows to change from one task (or process) to another while ensuring that the tasks do not conflict. Effective context switching is critical if a computer is to provide user-friendly multitasking.

A context switch can be performed entirely in hardware (physical media). Older CPUs, such as those in the x86 series, do it that way. However, most modern CPUs perform context switches by means of software(programming). A modern CPU can perform hundreds of context switches per second. Therefore, the user gets the impression that the computer is performing multiple tasks in a parallel fashion, when the CPU actually alternates or rotates between or among the tasks at a high rate of speed.

Ans 8:

|  |  |  |
| --- | --- | --- |
|  | **Minimum** | **Maximum** |
| Ready | 0 | M |
| Running | 0 | N |
| Block | 0 | M |

Ans 9:

**Long term scheduler**-It is also called a job scheduler. A long-term scheduler determines which programs are admitted to the system for processing. It selects processes from the queue and loads them into memory for execution. Process loads into the memory for CPU scheduling. The primary objective of the job scheduler is to provide a balanced mix of jobs, such as I/O bound and processor bound. It also controls the degree of multiprogramming. If the degree of multiprogramming is stable, then the average rate of process creation must be equal to the average departure rate of processes leaving the system.

**Short term scheduler-** It is also called as CPU scheduler. Its main objective is to increase system performance in accordance with the chosen set of criteria. It is the change of ready state to running state of the process. CPU scheduler selects a process among the processes that are ready to execute and allocates CPU to one of them.

**Medium term scheduler-** Medium-term scheduling is a part of swapping. It removes the processes from the memory. It reduces the degree of multiprogramming. The medium-term scheduler is in-charge of handling the swapped out-processes.A running process may become suspended if it makes an I/O request. A suspended processes cannot make any progress towards completion. In this condition, to remove the process from memory and make space for other processes, the suspended process is moved to the secondary storage. This process is called swapping, and the process is said to be swapped out or rolled out. Swapping may be necessary to improve the process mix.

Ans 10:

1.The best way to reduce the amount of errors a user makes is to anticipate possible mistakes and prevent them from happening in the first place. If the errors are unavoidable we need to make them easy to spot and help the user to recover from them quickly and without unnecessary friction.

2. People are aware of the opportunity to interact with interactive media. As interface designers, we must avoid developing hidden interactions, which decrease the usability, efficiency, and user experience of interactive media. In other words, people should not have to guess or look for opportunities to interact.

3. The range of possible actions should be no more than is absolutely necessary. Providing too many options can detract from the primary functions and reduce usability by overwhelming the user with choices. To achieve the zen of ‘functional minimalism’:

Ans 11:

Virus programs in the Internet are not that powerful enough to get into a computer hardware. So the Virus program first needs to get into the Motherboard firmware (BIOS) to take control of the whole system. A CPU is a hardware component and that cannot be attacked directly by a software program (Virus).CPU is coded in assembly language that is a very hard language to understand and before that virus has to attack the os which is in c++ where data is abstracted . Also a CPU isn't a single component. It has two more units inside it called the Arithmetic Logic Unit and the Control Unit. It is basically super complex to code a virus to do so.

.

Ans 12:

The dispatcher is the module that gives control of the CPU to the process selected by the short-time scheduler(selects from among the processes that are ready to execute).

Ans 13:

Almost all the modern telecommunication systems make use of RTOS.

Radar systems, network switching control systems, satellite monitoring systems,satellite

launch-control and maneuvering mechanisms, global positioning systems all have their roots in RTOS.

Ans 14:

When a program in user mode requires access to RAM or a hardware resource, it must ask the kernel to provide access to that resource. This is done via something called a system call.

Ans 15:

The fork call basically makes a duplicate of the current process, identical in almostevery way The new process gets a different process ID and has the the PID of the old process as its parent PID .Because the two processes are now running exactly the same code, they can tell which is which by the return code of fork - the child gets 0, the parent gets the PID of the child.

The exec call is a way to basically replace the entire current process with a new program. It loads the program into the current process space and runs it from the entry point