1 functions of operating systems

An operating system has three main functions: (1) manage the computer's resources, such as the central processing unit, memory, disk drives, and printers, (2) establish a user interface, and (3) execute and provide services for applications software. Also belong to security,memory,processor,device,file management.

2 what is Operating System

An operating system (OS) is system software that manages computer hardware, software resources, and provides common services for computer programs. ... Operating systems are found on many devices that contain a computer – from cellular phones and video game consoles to web servers and supercomputers.

3 what are types of Operating System

Operating System : Payroll system,Bank statements

Interactive OS: mobile telephones,cash dispensing machines car navigation system

Real Time OS: spacecraft,airport traffic control,medical system.

Hybrid OS: microsoft windows NT kernel

Network OS: Mac os x, Unix, Linux

Embeded OS: digital music players, elevators, automobiles

4 What is Batch Operating System

Only one job can be entered at a time and when job begins processing ,the no other job can start processing until the resident job is finished. Yeni 1ci job bitene qeder 2cisin daxil ede bilmery

5 Multi-tasking operating system

A **multitasking operating system** (**OS**) is one that can work on more than one task at a time by switching between the tasks very rapidly. The tasks may all pertain to a single user or to multiple users. Adile diibki we can enter many jobs at in a time

6 Main functions of operating system

memory managment, processor management ,device management ,file management, security management

8 What are the goals of memory management

In operating systems, memory management is the function responsible for managing the computer's primary memory. The memory management function keeps track of the status of each memory location, either allocated or free. ... When memory is allocated it determines which memory locations will be assigned OR

* It decides which process should reside in the main **memory**.
* Manages the parts of the virtual address space of a process which is non-core resident.
* Monitors the available main **memory** and periodically write the processes into the swap device to provide more processes fit in the main **memory** simultaneously.

9 – why is memory managment is important in os?

The **essential** requirement of **memory management** is to provide ways to dynamically allocate portions of **memory** to programs at their request, and free it for reuse when no longer needed. This is critical to any advanced computer system where more than a single process might be underway at any time.

10-what is device manager

is the section of OS for controlling devices or allows user to view and control hardware.

11-evolution of os, first os

The first computers used batch **operating systems**, in which the computer ran batches of jobs without stop. Programs were punched into cards that were usually copied to tape for processing. When the computer finished one job, it would immediately start the next one on the tape.

12- what is file manager

A file manager or file browser is a computer program that provides a user interface to manage files and folders. It is a section of os, responsible for controlling the use of files

13 – memory manager

In operating systems, memory management is the function responsible for managing the computer's primary memory. The memory management function keeps track of the status of each memory location, either allocated or free. ... When memory is allocated it determines which memory locations will be assigned OR

14 – first fit algorithm

**First Fit Algorithm** is the simplest technique of allocating the memory block to the processes amongst all. In this **algorithm**, the pointer keeps track of all the free blocks in the memory and accepts the request of allocating a memory block to the coming process.

15-best fit algorithm

The **best fit** deals with allocating the smallest free partition which meets the requirement of the requesting process. This **algorithm** first searches the entire list of free partitions and considers the smallest hole that is adequate. It then tries to find a hole which is close to actual process size needed.

16 – dynamic partition

Jobs are given only as much memory as they request when they are loaded

* + Available memory is kept in contiguous blocks
  + Memory waste is comparatively small

17-what is fragmentation?

Typeslari internal ve external imis mehi ele diib.

**Fragmentation** is an unwanted problem where the memory blocks cannot be allocated to the processes due to their small size and the blocks remain unused. ... Basically, there are two **types** of **fragmentation**: Internal **Fragmentation**. External **Fragmentation**.

18-which type of fragmentation reduces the device compaction?

The type of fragmentation which is reduce device compaction is external.

19- how often should reallocation be perform?

Before the running any program

20-what is embedded os?

An **embedded operating system** is an **operating system** for **embedded** computer **systems**. This type of **operating system** is typically designed to be resource-efficient and reliable. ... Unlike a desktop **operating system**, the **embedded operating system** does not load and execute applications.

21- fixed partition

**Fixed partitioning** is therefore defined as the system of dividing memory into non-overlapping sizes that are **fixed**, unmoveable, static. A process may be loaded into a **partition** of equal or greater size and is confined to its allocated **partition**.

Main memory is partitioned; one partition/job

* + Allows multiprogramming
  + Partition sizes remain static unless and until computer system id shut down, reconfigured, and restarted
  + Requires protection of the job’s memory space
  + Requires matching job size with partition size

22- what is compaction?

**Compaction** is a process in which the free space is collected in a large memory chunk to make some space available for processes. In **memory management**, swapping creates multiple fragments in the memory because of the processes moving in and out. **Compaction** refers to combining all the empty spaces together and processes.

23 - Relocatable dynamic partition In relocatable dynamic partition, memory manager in operating system relocates the program, that is all empty blocks are gathered to form one single block of large memory enough to accommodate some or all of the jobs waiting in the queue.

24-what is external fragmentation?

**External fragmentation** arises when free memory is separated into small blocks and is interspersed by allocated memory. It is a weakness of certain storage allocation algorithms, when they fail to order memory used by programs efficiently.

25-what is multitasking?

**Multitasking**, in an **operating system**, is allowing a user to perform more than one computer **task** (such as the **operation** of an application program) at a time. The **operating system** is able to keep track of where you are in these tasks and go from one to the other without losing information.

26-what is hybrid system?

Combination of batch and interactive system. They appear to be interactive because individual users can enter multiple jobs or processes into the system and get fast responses, but these systems actually accept and run batch programs in the background when the interactive load is light. A hybrid system takes advantage of the free time between high-demand usage of the system and low demand times.

27- Single-User Contiguous Scheme:

The entire program or job is first loaded into memory contiguously as much as possible before the execution. ... To execute the program either the size of the memory available needs to be increased or the size of the program needs to be decreased to fit in the available memory.

28 – what is virtual memory?

**Virtual memory** is a feature of an operating system that enables a computer to be able to compensate shortages of physical memory by transferring pages of data from random access memory to disk storage. This process is done temporarily and is designed to work as a combination of RAM and space on the hard disk.

MELLM DIIRKI it is a Teknik, that allows programs to be executed even those they are stored in entire memory

29-what is page map table?

A **page table** is the data structure used by a virtual memory system in a computer operating system to store the **mapping** between virtual addresses and physical addresses. ... The **page table** is a key component of virtual address translation which is necessary to access data in memory.

30 – what manages the operating system?

**Operating system** (**OS**), program that **manages** a computer's resources, especially the allocation of those resources among other programs. Typical resources include the central processing unit (CPU), computer memory, file storage, input/output (I/O) devices, and network connections.

31-internal fragmentation

**Internal Fragmentation** occurs when a process needs more space than the size of allotted memory block or use less space. External **Fragmentation** occurs when a process is removed from the main memory. ... **Internal Fragmentation** occurs when Paging is employed. External **Fragmentation** occurs when Segmentation is employed.

32- what is deallocation?

**Deallocation** of memory by the **Operating System** (**OS**) is a way to free the Random Access Memory (RAM) of finished processes and allocate new ones. ... Finished processes are **deallocated** or removed from the memory and new processes are allocated again.

**Deallocation: Deallocation** or **deallocate** is where a block of information is released from the computer's memory to be used by a different program or freeing allocated memory space

33-what is first in/first out policy?

MELLM DIRKI it is a page replacement policy that remove the page that we brovs(bu sozu anlamadm) in first

Nesede page replacement policy diin getsn

Stands for "**First In, First Out**." FIFO is a method of processing and retrieving data. In a FIFO **system**, the **first** items entered are the **first** ones to be removed. In other words, the items are removed in the same order they are entered.

MENCE BU SUALA BILMEDIM DIIN BU NE LO

why is memory management important

it affects the execution time of process directly. ... An effective memory management system ensures the accuracy, availability, and consistency of the data imported from the secondary memory to the main memory

page table

A page table is the data structure used by a virtual memory system in a computer operating system to store the mapping between virtual addresses and physical addresses. ... The page table is a key component of virtual address translation which is necessary to access data in memory.

Device Management

**Device management** is the process of managing the implementation, operation and maintenance of a physical or virtual device. It is a broad term that includes various administrative tools and processes for the maintenance and upkeep of a computing, network, mobile and virtual device.

**Paged memory allocation** is the process of storing a portion of an executing process on disk or secondary memory. Main memory, or RAM, has fast access times but comparatively low storage capacity. There are some programs that are too big to fit completely into the system's main memory.

**Virtual memory** is a feature of an operating system that enables a computer to be able to compensate shortages of physical memory by transferring pages of data from random access memory to disk storage. This process is done temporarily and is designed to work as a combination of RAM and space on the hard disk.

**Single User System-** A **single**-**user** operating system is a type of system that has been developed and designed to use on a computer. It can be used on a similar device, and it only has one user at a time. It's the most common system used for home computers. It's also used in offices and other work environments.

**Fixed Partitions:** Main memory is partitioned; one partition/job

* + Allows multiprogramming
  + Partition sizes remain static unless and until computer system id shut down, reconfigured, and restarted
  + Requires protection of the job’s memory space
  + Requires matching job size with partition size

**Dynamic Partitions:** Jobs are given only as much memory as they request when they are loaded

* + Available memory is kept in contiguous blocks
  + Memory waste is comparatively small

**Relocatable Dynamic Partitions:** Memory Manager relocates programs to gather together all of the empty blocks

* + Compact the empty blocks to make one block of memory large enough to accommodate some or all of the jobs waiting to get in

**Compaction:** Reclaiming fragmented sections of the memory space

* + Every program in memory must be relocated so they are contiguous
  + Operating system must distinguish between addresses and data values

**Deallocation: Deallocation** or **deallocate** is where a block of information is released from the computer's memory to be used by a different program or freeing allocated memory space

Important functions of an operating System:

Security –

The operating system uses password protection to protect user data and similar other techniques. it also prevents unauthorized access to programs and user data.

Control over system performance –

Monitors overall system health to help improve performance. records the response time between service requests and system response to have a complete view of the system health. This can help improve performance by providing important information needed to troubleshoot problems.

Job accounting –

Operating system Keeps track of time and resources used by various tasks and users, this information can be used to track resource usage for a particular user or group of user.

Error detecting aids –

Operating system constantly monitors the system to detect errors and avoid the malfunctioning of computer system.

Coordination between other software and users –

Operating systems also coordinate and assign interpreters, compilers, assemblers and other software to the various users of the computer systems.

Memory Management –

Memory management is the functionality of an operating system which handles or manages primary memory and moves processes back and forth between main memory and disk during execution. ... It checks how much memory is to be allocated to processes. It decides which process will get memory at what time.

Processor Management –

In a multi programming environment, the OS decides the order in which processes have access to the processor, and how much processing time each process has. This function of OS is called process scheduling. An Operating System performs the following activities for processor management.

Keeps tracks of the status of processes. The program which perform this task is known as traffic controller. Allocates the CPU that is processor to a process. De-allocates processor when a process is no more required.

Device Management –

An OS manages device communication via their respective drivers. It performs the following activities for device management. Keeps tracks of all devices connected to system. designates a program responsible for every device known as the Input/Output controller. Decides which process gets access to a certain device and for how long. Allocates devices in an effective and efficient way. Deallocates devices when they are no longer required.

File Management –

A file system is organized into directories for efficient or easy navigation and usage. These directories may contain other directories and other files. An Operating System carries out the following file management activities. It keeps track of where information is stored, user access settings and status of every file and more… These facilities are collectively known as the file system.