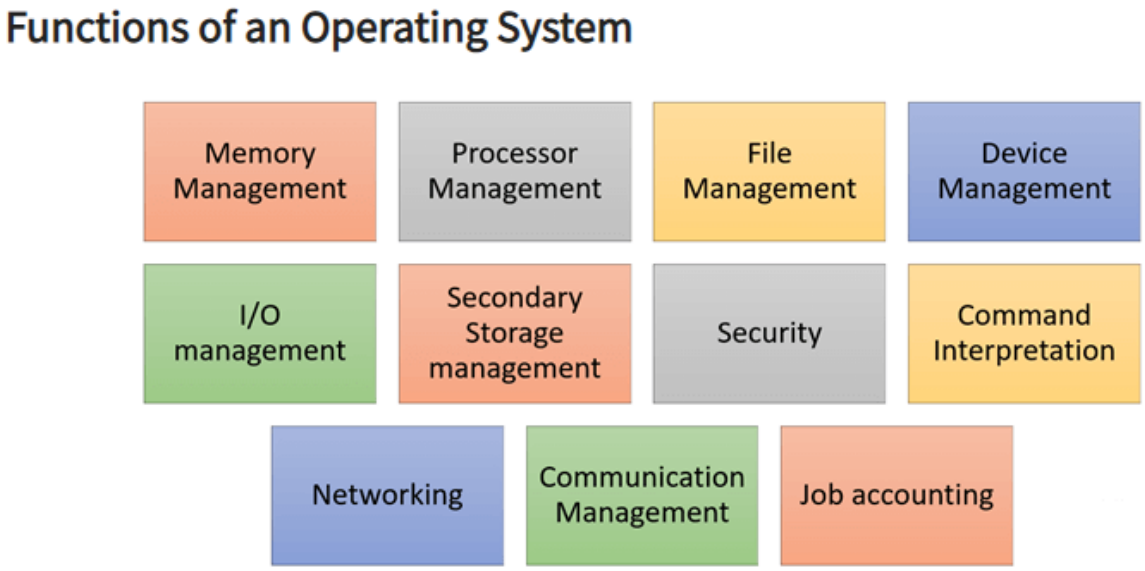
Tutorial_1 Solution

1. What is an operating system?
   An **Operating system (OS)** is a software which acts as an interface between the end user and computer hardware. Every computer must have at least one OS to run other programs. An application like Chrome, MS Word, Games, etc needs some environment in which it will run and perform its task. The OS helps you to communicate with the computer without knowing how to speak the computer's language. It is **not** possible for the user to use any computer or mobile device without having an operating system.
2. Examples of operating system.
   (i) Microsoft Windows
   (ii) Apple iOS
   (iii) Google's Android OS
   (iv) Apple macOS
   (v) Linux Operating System
3. What are the features of operating systems?

   a. Protected and supervisor mode
   b. Allows disk access and file systems Device drivers Networking Security
   c. Program Execution
   d. Memory management Virtual Memory Multitasking
   e. Handling I/O operations
   f. Manipulation of the file system
   g. Error Detection and handling
   h. Resource allocation
   i. Information and Resource Protection
4. What are types of operating systems?

   a. Batch Operating System
   b. Multitasking/Time Sharing OS
   c. Multiprocessing OS
   d. Real Time OS
   e. Distributed OS
   f. Network OS
   g. Mobile OS
5. Basic functions of an operating system.



Function of an Operating System

6. What are the differences between multiprocessing and multiprogramming?

Sr. No.	Multiprocessing	Multiprogramming
1	Multiprocessing refers to processing of multiple processes at same time by multiple CPUs.	Multiprogramming keeps several programs in main memory at the same time and execute them concurrently utilizing single CPU.
2	It utilizes multiple CPUs.	It utilizes single CPU.
3	It permits parallel processing.	Context switching takes place.
4	Less time taken to process the jobs.	More Time taken to process the jobs.
5	It facilitates much efficient utilization of devices of the computer system.	Less efficient than multiprocessing.
6	Usually more expensive.	Such systems are less expensive.

7. The software that contains the core components of the operating system is called
    a. Controller
    b. Root
    c. Kernel
    d. None of the above
8. Classify the following as batch-oriented or interactive
    a. Email communications --- interactive
    b. Word Processing ---- interactive
    c. Bank statements ----- batch
    d. Fixed employee payroll processing --- batch
9. Which of the following are single user operating systems?
    a. MS-DOS
    b. UNIX
    c. XENIX

d. Both a and b

10. Loading the OS into the memory of a PC is called
    a. Thrashing
    b. Booting
    c. Formatting
    d. Scheduling
11. The Operating system is responsible for
    a. Controlling peripheral devices such as monitor, printers, disk drivers
    b. Providing an interface that allows user to choose programs to run and to manipulate files
    c. Managing users' files on disk
    d. All the above
12. What is not the major objective of an operating system?
    a. To act as a resource manager for multiple tasks
    b. To provide an interface to user.
    c. To act as a uniform abstract machine on top of a variety of different hardware platforms
    d. To enable loading and execution of binary code with minimum intervention by the user
13. Which of the following states is not a discrete process state?
    a. running state
    b. new state
    c. ready state
    d. unblocked state
14. In a time-sharing operating system, when the time slot given to a process is completed, the process goes from the RUNNING state to the
    a. READY state
    b. BLOCKED state
    c. TERMINATED state
    d. SUSPENDED state
15. In the multi-programming environment, the main memory consists of _____ number of process.
    a. Greater than 10
    b. Only one
    c. More than one
16. In a multi-programming environment:
    a. The processor executes more than one process at a time
    b. More than one process resides in the memory
    c. None of the above
17. Suppose that a process spends a fraction p of its time in I/O wait state. With n processes in memory at once, the probability that all n processes are waiting for I/O is
    a. 1/p b. 1/pn c. 1 - pn **d. pn**
18. System call is used to access
    a. I/O functionality
    b. operating system functionality
    c. application functionality

d. none of the above

19. The maximum number of processes that can be in Ready state for a computer system with n processors is

a. n (b) n2 (c) 2n **(d) Independent of n**

20. Classify the following as Processor-bound or I/O bound
    a. Computing ‘pi’ to a million decimal places --- processor
    b. Data entry operation for a group of employees --- I/O
    c. A calculation-oriented program that frequently needs to take different parameters as input from the user --- I/O
    d. A calculation-oriented program that requires minimal intervention from the user --- processor
21. The number of processes completed per unit time is known as _____.
    a. Output
    b. Throughput
    c. Efficiency
    d. Capacity