Unix Operating System

- Unix is powerful Operating System.
- It is prevalent among scientific, engineering, and academic institution due to its most appreciate features like multitasking, flexibility and many more.
- UNIX, the file is a hierarchical structure of files and directories where users can store and retrieve information using the file.

Features of UNIX Operating System :-

1. Multitasking :-
- A UNIX operating is a multitasking operating system that allow you to intiate more than one task from the same terminal so that on task is performed as forground and other task performed in background.

2. Multiuser - Unix operating system supports more than one user to access computer resource like main memory, hard disk, tap drives etc

3. Portability :- This feature make the UNIX work on different machines and platform with easy transfer of Code to any comp. System.

4. File Security and protection :-
unix has different levels of security using assigning user name and password to individual users.

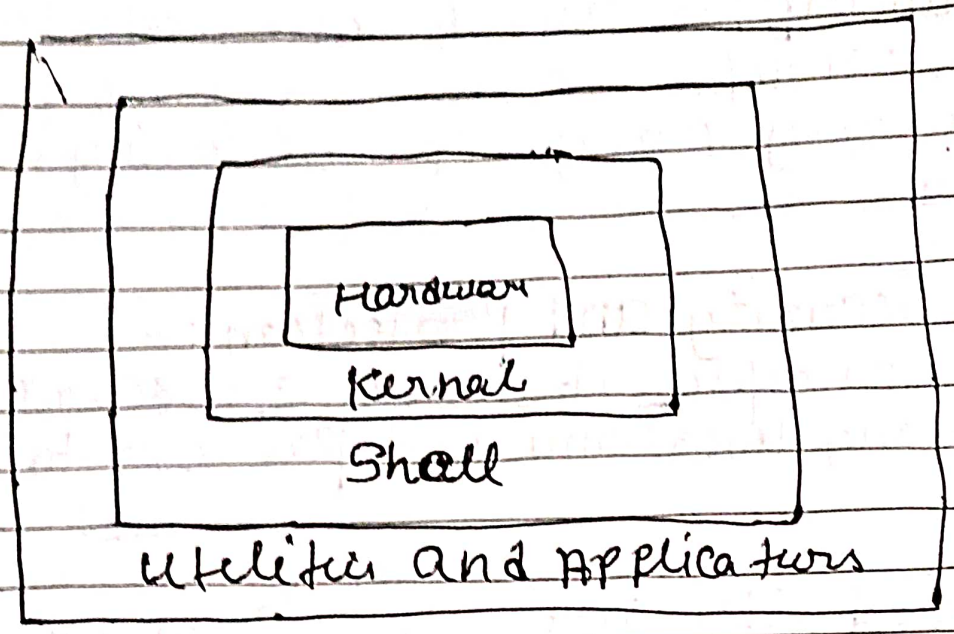
5. Command Structure — Unix Commands are easy to understand and simple to use.
Ex- "Cp" etc UNIX commands are case - sensitive.

6. Communication :-
- In Unix, it is an excellent feature
- it enable the user to communicate worldwide.

7. open source —
it means it is freely available to all and is a Community - based development Project.

8. Accounting — Unix keeps an account of jobs Created by the user.
This feature enhance the system performance in terms of CPU monitoring and disk space checking

9. UNIX tools and utilities :— Unix system provides various types of tools and utilities facilities such as UNIX grep, sed etc. some general tools are — compiler, interpreter, network applications.



~~The~~ Unix layers

- Hardware – ~~It~~ this layers consist all hardware related information in the Unix environment.

- Kernals – this core of the operating system that's leable for maintaining the full functionality is named the kernal.
  The kernal of UNIX runs on the particular machine hardware and interact with hardware effectively.

  - it also work as device manager and perform valuable function.
  - it manage the memory.

- Shell – The shell is an interpreter that interprets the command submitted by the user at the terminal, and calls the program you simply want.
  it also keep the history of the commands.

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Basic Unix Commands

1. who: The '$who' command displays all the user who have loged into the system currently.

2. pwd: The '$pwd' command stand for 'print working directory' and displays the directory in which we are currently.

3. mkdir: The '$mkdir' stand for 'make directory' it create new directory.

4. rmdir: The '$rmdir' stand for 'remove directory' used for delete any directory.

5. cd: The '$cd' stand for 'change directory' used to change current directory to 'new folder' directory.

6. ls: The 'ls' command simply displays the contents of a directory.

7. cp: The '$cp' stand for 'copy' and it simply copy 'Paste the file from a directory to another directory.

8. mv: The '$mv' command stand for 'move' and it simply move a.

9. rm: The '$rm' command for remove file.

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10. Chmod :- The '$ chmod' Command stands for Change mode Command.

11. Cal - The '$ cal' mean calender and it is used to display calender to your screen.

12. Sort - '$ sort' sorts the contents of the file.

13. man - '$ man' stands for 'manual' and it can display the inbuilt manual for most of commans.

14. lpr - The '$ lpr' command send a file to printer for printing.

15. passwd - used to Changes the password of the user

16. Clear - used to Clean up the termenal.

Important Question
C Language

① What is variable?

Ans A variable is a container which store a "value".

Ex - a = 3; // a is assigned "3"

Rules:

- First character must be an alphabet or - underscore (_)
- No commas, blanks allowed.
- NO special simbler other than (_) allowed
- Variable names are case sensitive.
- We must create meaningful variable names in our programs.

② What is constants in C programming

Ans An entity whose value does not change is called constant.

Note - a variable is an entity whose value can be changed.

There are 3 types

1) Integer Const. → -1, 6, 7, 9
2) Real Constant → 3.2, 7.0
3) Character Const. → 'a', '$'

③ What is Keywords in C programming.

Ans: Keywords are the reserved word whose meaning is already known by the compiler.

There are 32 keyword available in C.

Ex auto, break, char, int etc.

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(4) What is comments in C programming?

Ans- Comments are used to clarify something about the program in plain language. it is a way to add notes to our program.

two 2 - types

1. Single line Comment (//)
2. Multi line Comment (/* — */)

Note- Comments are ignored by compiler.

(5) What is library functions?

Ans C language have a lots of library function which is used to carry out certain tasks.

Ex- printf function is used to print value on the screen.

scanf function is used to take the input from the user.

Note- & → is the "address of" operator and it mean that the supplied value should be copied to the address.

(6.) What do you mean by Instructions in C programming?

Ans A C programming is a set of instructions. just like a recepie.

Types of instructions

1. Type declaration instruction
2. Arithmatic instruction
3. Control instruction

1. Type declaration instruction :-
it is used to declared the data type.
Ex- int a;
float a;

2. Arithmatic instruction :-

operator

int i = (3 * 2) + 1

Operand

3. Control instruction :-
Determine the flow of Control in a program
these are four types
1. Sequence control instruction
2. Decision control instruction
3. Loop control instruction
4. Case control instruction

(7) What is operator precedence in C.
Ans In C language simple mathmatical rules like BODMAS, no longer applies.
that by we used operator precedence & associatively.

priority	Operators
1st	* / %
2nd	+ -
3rd	=

(8) Define the following:
1) Relational operator
2) Logical operator
3) Conditional operator
4) Bitwise Operator

Ans8) 1) Relational operator – Relational Operator are used to evaluates Conditions (true or false) inside the if statements.
Ex –

== , >= , !=

== → equal
>= → greater than or equal to
!= → not equal to

2) Logical operator – && , || and ! are three logical Operators in C are read as "AND", "OR", "NOT".
They are used to provide logic to our C programs
(i) && → AND → is true when both Conditions true.
(ii) || → OR → is true when at least on of the Condition is true.
(iii) ! → NOT → return true if given false and false if given true.

3) Conditional operator –
A short hand "if-else" Can be written using the Conditional or ternerary operator.

Condition? expression-if-true ; expression-if-false

(9) What do you mean by switch case control instructions?

Ans Switch case is used when we have to make a choice b/w numb of alternatives for a given variables.

syntax:

```
switch (integer - expression)
{
case C1: // do something
        break;
case C2: // do something
        break;
default: // do something
}
```

Note -

Priority	Operator
1th	!
2th	* / %
3th	+, -
4th	< >, <=, >=
5th	=, !=
6th	&&
7th	||
8th	=

(10) What is loop control instructions? -

Sometimes we want our programs to set of instructions over and over again.

Ex- Printing 1 to 100, first 100 even num.

hence loops make it easy for a programmer

Types of Loops

1. while loop
2. do while
3. for loop

① while loop -

Syntex :-

```
while (Contion is true) {
        // Code
}
```

Ex -

```
int i=0
while (i<10) {
    printf("The value of i is %d", i); i++;
}
```

② do while loop -

```
do {
    // Code;
} while (Condition)
```

Note - while - Check the Condition & then execute Code
do while - executes the Code & then Check the Cond.

③ for loop -

```
for (intialize ; Condition , updation) {
    // do somthing
}
```

(11) What do you mean by break and continue?

Ans: 1. break – The break statement is used to exist the loop irrespective of whether the condition is true or false.

- break is encountered inside the loop

Ex

```
for (i=0, i<1000; i++) {
    printf ("%d\n", i);
    if (i==5) {
        break;
    }
}
```

2. Continue – The Continue statement is used to immidetly move to the next iteration of the loop

Ex.

```
int Skip = 5;
int i = 0;
while (i < 10) {
    if (i != Skip)
        Continue;
else
    printf ("%d", i);
}
```

(12) What is a function?

Ans12 A function is a block of code which perform a particular task.
A function can be reused by the programmer in a given program any num. of times.

Ex-

```
# include <stdio.h>
void display();  ⇒ function prototype

int main() {
  int a;
  display();  ⇒ function call
  return 0;
}
void display() {  ⇒ function defination
  printf("Hi I am display")
}
```

- function prototype - it is way to tell the compiler about the function we are going to define in a program.

- function call - function call is a way to tell the compiler to execute the function body at time.

- function defination - This part contains the exact set of instructions which are executed during the function call.

(13) What do you mean by Recursion?

Ans: A function defined in C can call itself. This is called Recursion.
A function calling itself is also called 'Recursive' function

Ex-

factorial (n) = 1 x 2 x 3 . . . . x n
factorial (n) = 1 x 2 x 3 . . . . (n-1) x n

Program :-

```
int factorial(int x) {
  int f;
  if (x == 0 || x == 1)
      return 1;
else
  f = x * factorial (x-1);

  return f;
  }
```

(14) What is Arrays?

An array is a collection of similar elements.

Syntex -

int marks [90]; ⇒ integer array
char name [20]; ⇒ character array or string.
float percentile [90]; ⇒ float array

- The array index start with 0.

Marks	7	6	21	3	91		88	89
	0	1	2	3	4 . . .		88	89

total 90 elements

(15) What is storage class ?

Ans: Storage class specifiers : Static, register, auto, extern

A storage classess define the scope and life time of variable and functions.

Storage Class	Memory	Default value	Scope	life time
auto	RAM	Garbage	within the block	Till the block is active
Static	RAM	0	within the block	till the termination of program
extern	RAM	0	Any where in the program	till the termination of program
Register	Register	Garbage	within the block	till the block is active

(16) Explain CALL BY VALUE and CALL BY REFERENCE

Call by value	Call by REFERENCE
• it passes the value of variable eg. abc(a); a=10;	• it passess the address of variable eg. abc(&a);
• In this method the actual value is not modified	• The actual value is modified
• the method is slow.	• The method is fast.
• It require more memory	• It require less memory.
• it is less efficient	• Pointer are used in this case
In this case no pointer is used	