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ASSIGNMENT 1

Unit-1 Computer and System Software

Q.1 What are the key features of in the C programming language?

→ The key features in the C language are:

(1) Simple and Efficient

The basic syntax of implementing C language is very simple and easy to learn.

(2) Fast.

C is a statically typed programming language, which gives it an edge over other dynamic languages because statically typed programming language are faster than dynamic ones.

(3) Dynamic Memory Management.

In C, we can utilize and manage the size of the data structure in C during runtime. Also C provides several predefined functions to work with memory allocation.

(4) Extensibility

You can easily extend a C program even when it is already written, you can add new features to it with a few alterations.

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(5) Portability.

* C programs are machine independent which means that you can run the fraction of a code created in C on various machines with none or some machine specific changes.

(6) Function - Rich libraries.

C comes with an extensive set of libraries with several built-in features that make the life of a programmer easy.

(7) Recursion.

Recursion (means you can create a fxⁿ that can call itself multiple times until a given condition is true, just like loops.) in C programming provides the functionality of code reusability and backtracking.

Q.2 Explain different types of operators in C.

→ An operator is a symbol that tells the computer to perform specific mathematical or logical functions.

There are mainly six types of operators in C, which are:

(1) Arithmetic Operators.

Assume variable A=10 and B=20
then-

operator	Description	Example
+	Adds two operands	$A + B = 30$
-	Subtracts two operands.	$A - B = -10$
*	Multiply both operands	$A * B = 200$
/	Divides both operands.	$A / B = 2$
%	Gives remainder after an integer division	$B \% A = 0$
++	Increment increases value by one.	$A++ = 11$
--	Decrement decreases value by one.	$B-- = 29$

(2) Relational Operators

Assume variable $A = 10$ & $B = 20$, then -

$==$	(1) Checks if two values of two operands are equal or not.	$(A == B)$ is not true.
$!=$	(2) Checks if two values of two operands are equal or not.	$(A != B)$ is true
$>$	(3) Checks if left value is greater than right value.	$(A > B)$ is not true
$<$	(4) Checks if right value is greater than left value.	$(A < B)$ is true
\geq	(5) Checks if the value of left is greater or equal to right value	$(A \geq B)$ is not true
\leq	(6) Checks if the right value is greater or equal to left value	$(A \leq B)$ is true.

* If yes, then condition becomes true (1,3,4,5,6)

* If values are not equal, then condition becomes false (2)

(3) logical Operators.

operator	Description	Symbols.
&&	Called logical AND operator. If both the operands are non-zero, then the conditions become true.	$(A \&\& B)$ is false
	Called logical OR operator. If any of the two is non-zero, then the condition become true.	$(A B)$ is true
!	Called logical NOT operator. It is used to reverse logical state. If a condition is true, it will make it false.	$!(A \&\& B)$ is true.

(4) Bitwise Operations.

&	Binary AND operator copies a bit to the result if it exists ^{operand} in both.	$(A \& B) = 12$ i.e 0000 1100
	Binary OR operator copies a bit of it exists in either operand	$(A B) = 61$ i.e 0011 1101.

(5) Assignment Operator.

=	Assign values from left side operand to right side operand.	$C = A + B$ will assign value of $A + B$ to C .
<<=	left shift AND assignment operator	$C <<= 2$ is same as $C = C << 2$
>>=	Right shift AND assignment operator	$C >>= 2$ is same as $C = C >> 2$.

(6) Shift Operator.

example: $<<$, $>>$

From this operator values is moved by the number specified

Q.3 Differentiate the term keywords , identifiers and variables with example.

→ Keywords: They are reserve words in C language , its definition is stored in C library , these ~~big~~ keywords have fixed meaning.

There are 32 keywords available in C language.

e.g: int , float , double , character etc

Identifier: It is only used to identify an entity uniquely in a program at the time of execution whereas, a variable is a name given to a memory location , that is used to hold a value.

e.g: int money , double accountbalance

(these are identifiers)
(name of variables)

Variables: Variable is a storage place which has some memory , allocated during declaration . It is used to store the data or value .

e.g: int a=5 , float b=6.9

→ these are variables

(which means "5" value is stored in 'a' and "6.9" value is stored in 'b').

Q.4

write a C program that read 5 numbers and sum of all odd values between them.

→

```
#include <stdio.h>
```

```
int main ()
```

```
{
```

```
    int a, b, c, d, e, sum;
```

```
    printf ("Enter five values: ");
```

```
    scanf ("%d %d %d %d %d", &a, &b, &c, &d, &e);
```

```
    if (a % 2 != 0)
```

```
{
```

```
        sum = sum + a;
```

```
}
```

```
    if (b % 2 != 0)
```

```
{
```

~~if~~ sum = sum + b;

```
}
```

```
    if (c % 2 != 0)
```

```
{
```

~~if~~ sum = sum + c;

```
}
```

```
    if (d % 2 != 0)
```

```
{
```

~~if~~ sum = sum + d;

```
}
```

```
    if (e % 2 != 0)
```

```
{
```

~~if~~ sum = sum + e;

```
}
```

```
    printf ("Sum of all odd values is %.d", sum);
```

```
    return 0;
```

```
}
```

Q.5 Write a C program that accepts an employee's ID , total worked hours of a month and the amount he received per hour. Print the employee's ID and salary of a particular month.

→ #include <stdio.h>

int main()

{

 int id , hour , value , salary ;

 printf ("Enter the Employee ID: ");

 scanf ("%d" , &id);

 printf ("Enter the working hours: ");

 scanf ("%d" , &hour);

 printf ("Enter the Salary amount : ");

 scanf ("%d" , &salary);

 Salary = value * hour ;

 printf ("Employee ID: %d \n Salary : %d \n" ,
 id , salary);

 return 0;

}

• Output :

Enter the Employee ID: 097

Enter the working hours: 8

Enter the salary amount : 75000

Employee ID: 097

Salary : \$ 600,000 .

Q.6 ~~What~~ What is operating system? Explain different types of operating system in detail.

→ An operating system is a software that acts as an interface between computer hardware components and the user.

Every computer system must have at least one operating system to run other programs.

The OS helps you to communicate with the computer without knowing how to speak the computer's language.

• ~~Nowadays~~ There are ^{different} ~~more~~ types of OS, which are:

i) Batch Operating System

> Some computer processes are very ~~lengthy~~ and time consuming. To speed the same process, a job with a similar type of needs are batched together and run as a group.

The user of BOS never directly interacts with the computer. In this type of OS, user prepares their job on an offline device and submit it to the computer operator.

ii) Multitasking / Time Sharing Operating System

> Time sharing OS enables people located at a different terminal to use a single computer system at the same time. The CPU which is shared among multiple users is termed as time sharing.

iii) Real Time Operating System

→ A real time OS is used for real time applications that processes data and events that have officially defined time constraints examples: Military Software Systems , Space Software system.

iv) Distributed Operating System.

→ Distributed systems use many processors located in different machines to provide very fast computation to its users. Each user holds a specific software subset of the global aggregate operating system.

v) Mobile Operating System.

→ Mobile OS are those OS which ~~are~~ especially ~~that~~ designed to power smartphones, tablets and wearable devices.

Some most famous mobile OS are iOS and Android but others include Blackberry, Web and watch OS.

vi) Networking Operating System

→ Network OS runs on a sever . It provides the capability to serve to manage data , user, groups , security , application and other networking functions.

Q.7

Write a C program to calculate the distance between the two points.

→

```
#include <stdio.h>
#include <math.h>
int main()
```

{

```
int x1, x2, y1, y2;
```

```
float distance;
```

```
printf("Enter the point x1: ");
```

```
scanf("%d", &x1);
```

```
printf("Enter the point y1: ");
```

```
scanf("%d", &y1);
```

```
printf("Enter the point x2: ");
```

```
scanf("%d", &x2);
```

```
printf("Enter the point y2: ");
```

```
scanf("%d", &y2);
```

```
distance = sqrt((x2 - x1) * (x2 - x1) + (y2 - y1) * (y2 - y1))
```

```
printf("The Distance between (%d,%d) and (%d,%d) is %f", x1, x2, y1, y2, distance);
```

```
return 0;
```

}

• Output :

Enter the point x1: 4

Enter the point y1: 5

Enter the point x2: 6

Enter the point y2: 7

The distance between (4,5) and (6,7) is

Q.8 Write a C program to calculate a biker's average consumption from the given total distance (integer value) travelled (in km) and spent fuel (in litres, float number - 2 decimal point).

→ `#include <stdio.h>`
`int main ()`
`{`

```
    int x;
    float y;
    printf ("Enter the distance travelled (km) : ");
    scanf ("%d", &x);
    printf ("Enter the spent fuel (l) : ");
    scanf ("%f", &y);
    printf ("The Average Consumption of the
    biker from the given data is %.2f km/l",
    x/y);
    return 0;
}
```

Output :

Enter the distance travelled (km) :

Enter the spent fuel (l) :

The Average Consumption of the biker
from the given data is

Q.9 Write a C program to enter a distance in to kilometer and convert it into meter, feet, inches and centimeter.

```
→ #include <stdio.h>
int main()
{
    int distance;
    float m, ft, in, cm;
    printf ("Enter the distance (km) : ");
    scanf ("%f", &distance);
    m = distance * 1000
    ft = distance * 3280.84
    in = distance * 39370.1
    cm = distance * 100000
    printf ("Meters = %.2f", m);
    printf ("Feet = %.2f", ft);
    printf ("Inches = %.2f", in);
    printf ("Centimeters = %.2f", cm);
    return 0;
}
```

• Output :

```
Enter the distance (km) : 7
Meters = 7000
Feet = 22965.88
Inches = 275590.7
Centimeters = 700000
```