C PROGRAMMING LECTURE

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Recap

C is a high-level language.

Writing a C code. {editors like gedit, vi}

- □ Compiling a C code. {gcc −c test.c −o test}
- Executing the object code. {./test}

Some more basics

- Keywords
 - char, static, if, while, return Total= about 32
- Data Types
 - int, char, float

...... Some more later

- Arithmetic Operators
 - + (Plus), (Minus), * (Multiplication), /(Division)

..... Some more later

My first C program!

```
#include <stdio.h>
// program prints hello world
int main() {
   printf ("Hello world!");
   return 0;
}
```

Output: Hello world!

Example 1

```
#include <stdio.h>
// program prints a number of type int
int main() {
    int number = 4;
    printf ("Number is %d", number);
    return 0;
}
```

Output: Number is 4

Example 2

```
#include <stdio.h>
// program reads and prints the same thing
int main() {
  int number ;
  printf (" Enter a Number: ");
  scanf ("%d", &number);
  printf ("Number is %d\n", number);
  return 0;
Output: Enter a number: 4
         Number is 4
```

more and more

```
#include <stdio.h>
int main() {
 /* this program adds
 two numbers */
 int a = 4; //first number
 int b = 5; //second number
 int answer = 0; //result
 answer = a + b;
```

Note

Errors

Compilation

Compiler generally gives the line number at which the error is present.

Run time

C programs are sequential making the debugging easier.

Some more Data Types

- □ Primary : int, float, char
 - □ int (signed/unsigned)(2,4Bytes): used to store integers.
 - char (signed/unsigned)(1Byte): used to store characters
 - □ float, double(4,8Bytes): used to store a decimal number.
- User Defined:
 - typedef: used to rename a data type
 - typedef int integer; can use integer to declare an int.
 - enum, struct, union

Some more Arithmetic Operators

- □ Prefix Increment: ++a
 - **•** example:
 - int a=5;
 - b=++a; // value of b=6; a=6;

- □ Postfix Increment: a++
 - example
 - int a=5;
 - b=a++; //value of b=5; a=6;

Contd...

- Modulus (remainder): %
 - **•** example:
 - **12%5 = 2**;
- Assignment by addition: +=
 - example:
 - int a=4;
 - \blacksquare a+=1; //(means a=a+1) value of *a* becomes 5

Can use -, /, *, % also

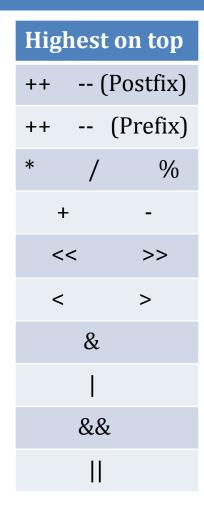
Contd...

- Comparision Operators: <, > , <=, >= , !=, ==, !, &&, || .
 - **•** example:
 - int a=4, b=5;
 - a<b returns a true(non zero number) value.</p>
- □ Bitwise Operators: <<, >>, \sim , &, |, $^{\wedge}$.
 - example
 - int a=8;
 - a= a>>1; // value of a becomes 4

Operator Precedence

- Meaning of a + b * c?
 is it a+(b*c) or (a+b)*c?
- All operators have precedence over each other
- □ *, / have more precedence over +, -.
 - If both *, / are used, associativity comes into picture. (more on this later)
 - example:
 - $\mathbf{5}+4*3=5+12=17.$

Precedence Table



Input / Output

- printf (); //used to print to console(screen)scanf (); //used to take an input from console(user).
 - example: printf("%c", 'a'); scanf("%d", &a);
 - More format specifiers

```
%c The character format specifier.
```

%d The integer format specifier.

%i The integer format specifier (same as %d).

%f The floating-point format specifier.

%o The unsigned octal format specifier.

%s The string format specifier.

%u The unsigned integer format specifier.

%x The unsigned hexadecimal format specifier.

%% Outputs a percent sign.

Some more geek stuff

- □ & in scanf.
 - It is used to access the address of the variable used.
 - example:
 - scanf(%d,&a);
 - we are reading into the address of a.
- Data Hierarchy.
 - **•** example:
 - int value can be assigned to float not vice-versa.
 - Type casting.

Home Work

- Meaning of
 - Syntax
 - Semantics of a programming language
- □ Find the Output:
 - value=value++ + value++;
 - Value=++value + ++value;
 - value=value++ + ++value;

End of Today's Lecture

Doubts && Queries?

THANK YOU