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;
    - 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.
- Bitwise Operators: <<, >>, ~, &, | ,^ .
  - 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 :
    - 5+4*3 = 5+12= 17.

Precedence Table

Highest on top
++ -- (Postfix)
++ -- (Prefix)
* / %
+ -
<< >>
< >
&
|
&&
||

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