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!

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

Output: Hello world!

Example 1

```c
#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

```c
#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)
*   /   %
+   -
<<   >>
<   >
&
|
&&
||

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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;

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End of Today's Lecture

Doubts && Queries?

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THANK   YOU