

• Importance of C

C is highly portable. This means that C programs written for one computer can be run on another with little or no modification. portability is important if we plan to use a new computer with a different OS.

C language is well suited for structural programming, i.e. requiring the user to think of a problem in terms of function modules or blocks.

• Sample program

main() → sp. function.

{ → starting of function

print("I see, I remember"); /* sample */

} → end of function

- main() is a special function computer understands the starting of the program. The program should contain only main function.

- /* */ → comments, this are not executable statements, they are ignored by compiler.

- printf("....") → printf() is a predefined function which is used to print the content between the quotation marks.

- \n → to print the data in new line or next line

printf("I see \n");

printf("I remember");

output

I see

I remember

• #include <stdio.h>

↳ at the beginning of all programs that use any I/O library functions.

• main-function

The main is a part of every C program. different forms of main are

• main()

• int main()

• void main()

• main(void)

• void main(void)

• int main(void).

void main → function does not return any info to the OS.

int main → function returns an integer value to OS. The last statement should be "return 0".

2) Adding two numbers.

#include <iostream.h>

int main()

{

int number1;

float amount;

number = 100;

amount = 30.75 + 75.35;

printf("%.d\n", number);

printf("%.2f", amount);

}

* The #define directive

#define is a preprocessor compiler directive and not a statement. It should not end with semicolon

Eg:- 3) Interest calculation

#define PERIOD 10

#define PRINCIPAL 5000.00

main()

{ int year;

float amount, value, inrate;

amount = PRINCIPAL;

inrate = 0.11;

year = 0;

while (year <= PERIOD)

{

printf("%.2d %.8.2f\n", year, amount);

value = amount + inrate * amount;

year = year + 1;

amount = value;

}

}

Output:

0 5000.00

1 5550.00

2 6160.50

10

14197.11

4) use of subroutines.

```
int mul (int a, int b) // declaration #1
```

```
main ()
```

```
{
```

```
int a, b, c;
```

```
a = 5;
```

```
b = 10;
```

```
c = mul(a, b);
```

```
printf("multiplication of %d and %d is %d", a, b, c);
```

```
}
```

```
int mul (int x, int y)
```

```
{
```

```
int p;
```

```
p = x * y;
```

```
return(p);
```

```
}
```

5) use of math-functions

we should include math library to use the pi, etc...

```
#include <math.h>
```

```
#include <math.h>
```

```
#define PI 3.1416
```

```
#define MAX 180.
```

```
main ()
```

```
{
```

```
int angle;
```

```
float x, y;
```

```
angle = 0;
```

```
printf("Angle cos(angle) \n \n");
```

```
while (angle <= max)
```

```
{
```

```
x = (PI/MAX) * angle;
```

```
y = cos(x);
```

```
printf("%.15d %.13.4f \n", angle, y);
```

```
angle = angle + 10;
```

```
}
```

```
}
```

* Basic structure of C program

Documentation section → set of comment lines

Link section → To Link system libraries

definition section → defines all symbolic constants

Global declaration section

main() function section
{

declaration part

executable part

}

subprogram section

function 1

function 2

...

function n.

user
defined

* Executing a 'C' program.

Involves several steps

1. creating the program
2. compiling the program
3. linking the program with functions that are needed from the C library
4. executing the program

* Summary

- Every C program requires a main() function, only one main()
- Every statement ends with semicolon;

```
supriya@ubuntu:~/Desktop/c/chp1$ cat mail.c
/* Write a program to print mailing address*/
#include <stdio.h>
int main()
{
    printf("Name : Supriya\n");
    printf("Door No ,Street : 462,Sairam \n");
    printf("City, Pin Code : Vijayawada, 520001\n");
    return 0;
}
supriya@ubuntu:~/Desktop/c/chp1$ ./mail
Name : Supriya
Door No ,Street : 462,Sairam
City, Pin Code : Vijayawada, 520001
supriya@ubuntu:~/Desktop/c/chp1$ █
```

```
supriya@ubuntu:~/Desktop/c/chp1$ cat border.c
```

```
/*modify the before code with border*/
```

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

```
int main()
```

```
{  
    printf("*****\n");
```

```
    printf("Name : Supriya\n");
```

```
    printf("Door No ,Street : 462,Sairam \n");
```

```
    printf("City, Pin Code : Vijayawada, 520001\n");
```

```
    printf("*****\n");
```

```
    return 0;  
}
```

```
supriya@ubuntu:~/Desktop/c/chp1$ ./border
```

```
*****
```

```
Name : Supriya
```

```
Door No ,Street : 462,Sairam
```

```
City, Pin Code : Vijayawada, 520001
```

```
*****
```

```
supriya@ubuntu:~/Desktop/c/chp1$ █
```

* * * * *
 * * * * *
 * * * * *
 * * * * *
 * * * * *

```
/* Print given figure with characters*/
#include <stdio.h>
int main()
{
    printf("[    ] --->> [    ]\n");
    return 0;
}
supriya@ubuntu:~/Desktop/c/chp1$ ./figure
[    ] --->> [    ]
```



```
/* Multiplication table of 5*/  
#include <stdio.h>  
int main()  
{  
    int i;  
    for(i = 1; i <= 10; i++)  
    {  
        printf("5 x %d = %d\n", i, 5*i);  
    } return 0;  
}
```

```
supriya@ubuntu:~/Desktop/c/chp1$ ./mul5
```

```
5 x 1 = 5  
5 x 2 = 10  
5 x 3 = 15  
5 x 4 = 20  
5 x 5 = 25  
5 x 6 = 30  
5 x 7 = 35  
5 x 8 = 40  
5 x 9 = 45  
5 x 10 = 50
```

```
supriya@ubuntu:~/Desktop/c/chp1$ cat distance.c
/* Distance between two points*/
#include <stdio.h>
#include <math.h>
int main()
{
    float x1,y1,x2,y2,d;
    printf("Enter (x1,y1): ");
    scanf("%f %f",&x1,&y1);
    printf("Enter (x2,y2): ");
    scanf("%f %f",&x2,&y2);
    d = sqrt((x2-x1)*(x2-x1) + (y2-y1)*(y2-y1));
    printf("Distance = %.2f\n", d);
    return 0;
}
supriya@ubuntu:~/Desktop/c/chp1$ ./distance
Enter (x1,y1): 4.6 1.6
Enter (x2,y2): 5.7 9.8
Distance = 8.27
```

```
/* Compute x = a / (b-c)*/
#include <stdio.h>
int main()
{
    int a,b,c;
    float x;
    printf("enter the values of a,b,c\n");
    scanf("%d %d %d",&a,&b,&c);
    if(b-c==0)
        printf(" Division by zero not possible\n");
    else
    {
        x =(float) a / (b-c);
        printf(" x = %.2f\n", x);
    }
    return 0;
}
```

supriya@ubuntu:~/Desktop/c/chp1\$./variable

enter the values of a,b,c

4 5 6

x = 1.00

```
/* Compute area of circle*/  
#include <stdio.h>  
#define PI 3.1416  
int main()  
{  
    int r;  
    float area;  
    r = 16;  
    area = PI * r * r;  
    printf("Area of circle = %.2f\n", area);  
    return 0;  
}  
supriya@ubuntu:~/Desktop/c/chp1$ ./area  
Area of circle = 804.25
```



```
/* Add and Subtract Using Functions*/
#include <stdio.h>
int add(int , int );
int sub(int , int );
int main()
{
    int a,b;
    a=20;
    b=10;
    printf("%d + %d = %d\n", a, b, add(a,b));
    printf("%d - %d = %d\n", a, b, sub(a,b));
    return 0;
}
int add(int a,int b)
{
    return a+b;
}
int sub(int a,int b)
{
    return a-b;
}
```

supriya@ubuntu:~/Desktop/c/chp1\$./fun

20 + 10 = 30

20 - 10 = 10

```
supriya@ubuntu:~/Desktop/c/chp1$ cat tri.c
```

```
/* Area of a triangle formula*/
```

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

```
#include <math.h>
```

```
int main()
```

```
{
```

```
    int a,b,c;
```

```
    float s, area;
```

```
    printf("Enter sides a, b, c: ");
```

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

```
    s = (a+b+c)/2;
```

```
    area = sqrt(s*(s-a)*(s-b)*(s-c));
```

```
    printf("Area of triangle = %.2f\n", area);
```

```
    return 0;
```

```
}
```

```
supriya@ubuntu:~/Desktop/c/chp1$ ./tri
```

```
Enter sides a, b, c: 5 6 7
```

```
Area of triangle = 14.70
```

```
supriya@ubuntu:~/Desktop/c/chp1$ cat arith.c
```

```
/* Simple arithmetic calculator*/  
#include <stdio.h>  
int main()  
{  
    float x, y;  
    printf("Enter two numbers: ");  
    scanf("%f %f", &x, &y);  
    printf("x = %.2f\n", x);  
    printf("y = %.2f\n", y);  
    printf("Sum = %.2f\n", x+y);  
    printf("Difference = %.2f\n", x-y);  
    printf("Product = %.2f\n", x*y);  
    if(y != 0)  
        printf("Division = %.2f\n", x/y);  
    else  
        printf("Division not possible (y=0)\n");  
    return 0;  
}
```

```
supriya@ubuntu:~/Desktop/c/chp1$ ./arith
```

```
Enter two numbers: 46 16
```

```
x = 46.00
```

```
y = 16.00
```

```
Sum = 62.00
```

```
Difference = 30.00
```

```
Product = 736.00
```

```
Division = 2.88
```

```
supriya@ubuntu:~/Desktop/c/chp1$ cat line.c
/* Display equation of line ax + by = c*/
#include <stdio.h>
int main()
{
    int a=5, b=8, c=18;
    printf("Equation of line: %dx + %dy = %d\n", a, b, c);
    return 0;
}
supriya@ubuntu:~/Desktop/c/chp1$ ./line
Equation of line: 5x + 8y = 18
```



```
supriya@ubuntu:~/Desktop/c/chp1$ cat circle.c
```

```
/*perimetre and area*/  
#include <stdio.h>  
#include <math.h>  
#define PI 3.1416  
int main()  
{  
    float x,y,r,area,perimeter;  
    printf("Enter coordinates of point on circumference: ");  
    scanf("%f %f",&x,&y);  
    r = sqrt(x*x + y*y);  
    perimeter = 2 * PI * r;  
    area=PI * r * r;  
    printf("Radius = %.2f\nPerimeter = %.2f\nArea = %.2f\n", r, perimeter, area);  
    return 0;  
}
```

```
supriya@ubuntu:~/Desktop/c/chp1$ ./circle
```

```
Enter coordinates of point on circumference: 4 5
```

```
Radius = 6.40
```

```
Perimeter = 40.23
```

```
Area = 128.81
```

```
/* Convert Celsius Fahrenheit*/  
#include <stdio.h>  
int main()  
{  
    float c, f;  
    printf("Enter temperature in Celsius: ");  
    scanf("%f", &c);  
    f = (9*c/5) + 32;  
    printf("Celsius to Fahrenheit: %.2f\n", f);  
    printf("Enter temperature in Fahrenheit: ");  
    scanf("%f", &f);  
    c = (f - 32) * 5 / 9;  
    printf("Fahrenheit to Celsius: %.2f\n", c);  
    return 0;  
}
```

supriya@ubuntu:~/Desktop/c/chp1\$./convert

Enter temperature in Celsius: 36

Celsius to Fahrenheit: 96.80

Enter temperature in Fahrenheit: 97.5

Fahrenheit to Celsius: 36.39