Introduction to Computers and Programming in C

[ES202]

Project File

AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY

AMITY UNIVERSITY, NOIDA, UTTAR PRADESH

SUBMITTED BY: Ishaan Rastogi

A2305223503

CSE8-X

SUBMITTED TO:

DR. NANCY GULATI

ASSISTANT PROFESSOR

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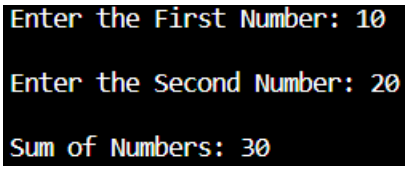
Programme 1A: **WAP in C to add 2 numbers**

```
#include <stdio.h>
int main(void)
{
   int A, B, sum;
   printf("\nEnter the First Number: ");
   scanf("%d",&A);
   printf("\nEnter the Second Number: ");
   scanf("%d",&B);
   sum = A + B;
   printf("\nSum of Numbers: %d",sum);
}
```

Input & Output-



Programme 1B: WAP in C to add 3 numbers

```
#include <stdio.h>
int main(void)
{
   int A, B, C, sum;
   printf("\nEnter the First Number: ");
   scanf("%d",&A);
   printf("\nEnter the Second Number: ");
   scanf("%d",&B);
   printf("\nEnter the Third Number: ");
   scanf("%d",&C);
   sum = A + B + C;
   printf("\nSum of Numbers: %d",sum);
}
```

Input & Output-

```
Enter the First Number: 10

Enter the Second Number: 20

Enter the Third Number: 30

Sum of Numbers: 60
```

Programme 2A: WAP in C to find the area of the circle

```
#include <stdio.h>
int main(void)
{
   float pie = 3.14;
   int radius;

   printf("Enter The Radius of Cicle:");
   scanf("%d",&radius);

   printf("The radius of the circle is %d\n" , radius);
   float area = (float)(pie* radius * radius);
   printf("The area of the given circle is %f", area);
}
```

Input & Output-

```
Enter The Radius of Cicle:5
The radius of the circle is 5
The area of the given circle is 78.500000
```

Programme 2B: WAP in C to find Simple Interest

```
#include<stdio.h>
int main(void)
{
   int P, R, T, SI;

   printf("Enter the principal: ");
   scanf("%d", &P);

   printf("Enter the rate: ");
   scanf("%d", &R);

   printf("Enter the time in years: ");
   scanf("%d", &T);

   SI = (P*R*T)/ 100;
   printf("The simple interest is %d", SI);
}
```

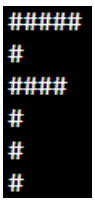
Input & Output-

```
Enter the principal: 1000
Enter the rate: 5
Enter the time in years: 2
The simple interest is 100
```

Programme 3: WAP in C to print a block F using (#), where F has a height of 6 characters & width of 5 & 4 characters

```
#include<stdio.h>

int main()

{

   printf("#####\n");

   printf("#\n");

   printf("####\n");

   printf("#\n");

   printf("#\n");

   printf("#\n");

}
```

Output-



Programme 4: WAP in C that accepts 2 item's weights (floating points' values) & no. of purchase (floating points' values) and calculate the average value of the items

```
#include<stdio.h>

int main(void)

{

   double W1, N1, W2, N2, result;

   printf("Weight of Item 1: ");

   scanf("%lf", &W1);


   printf("No. of Item 1: ");

   scanf("%lf", &N1);


   printf("Weight of Item 2: ");

   scanf("%lf", &W2);


   printf("No. of Item 2: ");

   scanf("%lf", &N2);


   result = ((W1*N1) + (W2*N2)) / (N1+N2);

   printf("Average Value = %f\n", result);

}
```

Input & Output-

```
Weight of Item 1: 2
No. of Item 1: 10
Weight of Item 2: 3
No. of Item 2: 15
Average Value = 2.600000
```

Programme 5A: WAP in C to swap 2 variables using a 3rd variable

```
#include<stdio.h>
int main(void)
{
   int a, b, temp;
   printf("Enter two integers:");
   scanf("%d%d", &a, &b);
   printf("Before Swapping First variable = %d\nSecond variable = %d \n", a, b);

   temp = a;
   a = b;
   b = temp;
   printf("After Swapping First variable = %d\nSecond variable = %d\n", a, b);
}
```

Input & Output-

```
Enter two integers:
10
20
Before Swapping First variable = 10
Second variable = 20
After Swapping First variable = 20
Second variable = 10
```

Programme 5B: WAP in C to swap 2 variables without using a 3rd variable

```
#include<stdio.h>
int main(void)
{
   int a, b, temp;
   printf("Enter two integers\n");
   scanf("%d%d", &a, &b);
   printf("Before Swapping\nFirst variable = %d\nSecond variable = %d\n", a, b);

   a += b;
   b = a - b;
   a -= b;
   printf("After Swapping\nFirst variable = %d\nSecond variable = %d\n", a, b);
}
```

Input & Output-

```
Enter two integers
10
20
Before Swapping
First variable = 10
Second variable = 20
After Swapping
First variable = 20
Second variable = 10
```

Programme 6A: WAP in C to convert a given integer (in seconds) to hours, minutes and seconds.

```
#include<stdio.h>

int main(void)

{

   int sec, h, m, s;

   printf("Input seconds: ");

   scanf("%d", &sec);


   h = (sec/3600);

   m = (sec -(3600*h))/60;

   s = (sec -(3600*h)-(m*60));

   printf("Hours:Minutes:Seconds - %d:%d:%d\n",h,m,s);

}
```

Input & Output-

```
Input seconds: 50001
Hours:Minutes:Seconds - 13:53:21
```

Programme 6B: WAP in C to convert specified days into years, weeks and days

```
#include<stdio.h>
int main(void)
{
   int D, Y, W;
   printf("Input number of days: ");
   scanf("%d", &D);

   Y = D/365;
   W = (D % 365)/7;
   D = D - ((Y*365) + (W*7));

   printf("Years: %d\n", Y);
   printf("Weeks: %d\n", W);
   printf("Days: %d \n", D);
}
```

Input & Output-

```
Input number of days: 1329
Years: 3
Weeks: 33
Days: 3
```

Programme 6C: WAP in C to check whether a number is even or odd

```
#include<stdio.h>
int main()
{
   int number;
   printf("Enter number: ");
   scanf("%d", &number);

   if (number % 2 == 0)
      {
         printf("even \n");
      }
   else
   {
      printf("odd");
   }
}
```

Input & Output-

```
Enter number: 10
even
```

Programme 7: **WAP in C to check whether a given year is leap year or not**

```
#include<stdio.h>
int main(void)
{
   int year;
   printf("Enter year: ");
   scanf("%d", &year);

   if (year % 4 == 0)
      {
         printf("It's a leap year. \n");
      }
   else
   {
      printf("It's not a leap year. ");
   }
}
```

Input & Output-

```
Enter year: 2024
It's a leap year.
```

Programme 8A: WAP in C to check whether a triangle is Equilateral, scalene or isosceles

```
#include<stdio.h>
int main(void)
{
   int a, b, c; //3 sides of a triangle
   printf("Input three sides of triangle: ");
   scanf("%d %d %d", &a, &b, &c);

   if(a==b && b==c) //check whether all sides are equal
   {
      printf("This is an equilateral triangle.\n");
   }
   else if(a==b || a==c || b==c) //check whether two sides are equal
   {
      printf("This is an isosceles triangle.\n");
   }
   else //check whether no sides are equal
   {
      printf("This is a scalene triangle.\n");
   }
}
```

Input & Output-

```
Input three sides of triangle: 3
4
5
This is a scalene triangle.
```

Programme 8B: WAP in C to check whether a triangle is right, obtuse or acute angle triangle

```
int main(void)
{
   double a, b, c;
   printf("Enter the three angles of the triangle (in degrees):\n");
   printf("Angle 1: ");
   scanf("%lf", &a);
   printf("Angle 2: ");
   scanf("%lf", &b);
   printf("Angle 3: ");
   scanf("%lf", &c);

   // Check if the sum of angles is 180 degrees (valid triangle)

   if (a + b + c == 180)
   {
      if (a == 90 || b == 90 || c == 90)
      {
         printf("It is a right angle triangle.\n");
      }
      else if (a > 90 || b > 90 || c > 90)
      {
         printf("It is an obtuse angle triangle.\n");
      }
      else
      {
         printf("It is an acute angle triangle.\n");
      }

   }
   else
   {
      printf("These angles do not form a valid triangle.\n");
   }

}
```

Input & Output-

```
Enter the three angles of the triangle (in degrees):
Angle 1: 90
Angle 2: 50
Angle 3: 40
It is a right angle triangle.
```

```
Enter the three angles of the triangle (in degrees):
Angle 1: 90
Angle 2: 50
Angle 3: 50
These angles do not form a valid triangle.
```

Programme 9: WAP in C to convert temp. from Fahrenheit to Celsius & vice-versa (User Input: Temp. Type)

```
#include<stdio.h>

int main()

{

   int choice;
   float temperature, convertedTemperature;

   printf("Temperature Conversion Menu:\n");
   printf("1. Fahrenheit to Celsius\n");
   printf("2. Celsius to Fahrenheit\n");
   printf("Enter your choice (1/2): ");
   scanf("%d", &choice);

   if (choice == 1)

   {
      printf("Enter temperature in Fahrenheit: ");
      scanf("%f", &temperature);
      convertedTemperature = (temperature - 32) * 5 / 9;
      printf("Temperature in Celsius: %.2f\n", convertedTemperature);
   }
   else if (choice == 2)
   {
      printf("Enter temperature in Celsius: ");
      scanf("%f", &temperature);
      convertedTemperature = (temperature * 9 / 5) + 32;
      printf("Temperature in Fahrenheit: %.2f\n", convertedTemperature);
   }
   else
   {
      printf("Invalid choice. Please select 1 or 2.\n");
   }
}
```

Input & Output-

```
Temperature Conversion Menu:
1. Fahrenheit to Celsius
2. Celsius to Fahrenheit
Enter your choice (1/2): 1
Enter temperature in Fahrenheit: 91
Temperature in Celsius: 32.78
```

Programme 10A: WAP in C to check whether a character is an alphabet or digit

```
#include<stdio.h>
int main(void)
{
   char ch;
   // Input character from user
   printf("Enter any character: ");
   scanf("%c", &ch);

   // Alphabet check
   if((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z'))
   {
      printf("'%c' is alphabet.", ch);
   }
   else if(ch >= '0' && ch <= '9')
   {
      printf("'%c' is digit.", ch);
   }
   else
   {
      printf("'%c' is special character.", ch);
   }
}
```

Input & Output-

```
Enter any character: @
'@' is special character.
```

Programme 10B: WAP in C to check whether an alphabet is a vowel or a consonant

```
#include<stdio.h>
int main(void)
{
   char c;
   printf("Input any alphabet : ");
   scanf("%c", &c);

   if(c=='a'|| c=='e' || c=='i' || c=='o' || c=='u' || c=='A' || c=='E' || c=='I' || c=='O' || c=='U')
   {
      printf("The alphabet is a vowel.\n");
   }
   else if((c>='a' && c<='z') || (c>='A' && c<='Z'))
   {
      printf("The alphabet is a consonant.\n");
   }
   else
   {
      printf("The character is not an alphabet.\n");
   }
}
```

Input & Output-

```
Input any alphabet : c
The alphabet is a consonant.
```

Programme 11A: WAP in C to find the smallest of 2 numbers

```
#include<stdio.h>
int main(void)
{
   int a, b;
   printf("Enter first number:");
   scanf("%d",&a);
   printf("Enter second number:");
   scanf("%d",&b);

   if(a < b)
   {
      printf("%d is smallest", a);
   }
   else
   {
      printf("%d is smallest", b);
   }
}
```

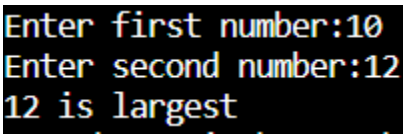
Input & Output-

```
Enter first number:10
Enter second number:12
10 is smallest
```

Programme 11B: WAP in C to find the largest of 2 numbers

```
#include<stdio.h>
int main(void)
{
   int a, b;
   printf("Enter first number:");
   scanf("%d",&a);
   printf("Enter second number:");
   scanf("%d",&b);

   if(a > b)
   {
      printf("%d is largest", a);
   }
   else
   {
      printf("%d is largest", b);
   }
}
```

Input & Output-



Programme 12: WAP in C to implement Simple Calculator

```
#include <stdio.h>
int main(void)
{
   char op;
   double a, b;
   printf("Enter an operator (+, -, *, /): ");
   scanf(" %c", &op);
   printf("Enter two numbers: ");
   scanf("%lf %lf", &a, &b);

   switch (op)

   {
      case '+':

         printf("%.2f + %.2f = %.2f\n", a, b, a + b);
         break;
      case '-':
         printf("%.2f - %.2f = %.2f\n", a, b, a - b);
         break;
      case '*':
         printf("%.2f * %.2f = %.2f\n", a, b, a * b);
         break;
      case '/':
         if (b != 0)
         {
            printf("%.2f / %.2f = %.2f\n", a, b, a / b);
         }
         else
         {
            printf("Error: Division by zero is not allowed.\n");
         }
         break;
      default:
         printf("Error: Invalid operator\n");
   }
}
```

Input & Output-

```
Enter an operator (+, -, *, /): *
Enter two numbers: 10
11
10.00 * 11.00 = 110.00
```

Programme 13: WAP in C to calculate the root of a Quadratic Equation

```
int main(void)
{
   float a, b, c, discriminant, root1, root2;
   printf("Enter the coefficients of the quadratic equation (a, b, c): ");
   scanf("%f %f %f", &a, &b, &c);
   discriminant = b*b - 4*a*c;

   if (discriminant < 0)
   {
      printf("No real roots exist.\n");
   }
   else if (discriminant == 0)
   {
      root1 = -b / (2 * a);
      printf("The root is: %.2f\n", root1);
   }
   else
   {
      root1 = (-b + sqrt(discriminant)) / (2 * a);
      root2 = (-b - sqrt(discriminant)) / (2 * a);
      printf("The roots are: %.2f and %.2f\n", root1, root2);
   }
}
```

Input & Output-

```
Enter the coefficients of the quadratic equation (a, b, c): 2
8
1
```

Programme 14: WAP in C to accept a coordinate point in a XY Coordinate system & determine in which quadrant the coordinate point lies.

```
#include <stdio.h>
#include <math.h>
int main(void)
{
   int co1,co2;
   printf("Input the values for X and Y coordinate : ");
   scanf("%d %d",&co1,&co2);


   if( co1 > 0 && co2 > 0)
   {
      printf("The coordinate point (%d,%d) lies in the First quandrant.\n",co1,co2);
   }
   else if( co1 < 0 && co2 > 0)
   {
      printf("The coordinate point (%d,%d) lies in the Second quandrant.\n",co1,co2);
   }
   else if( co1 < 0 && co2 < 0)
   {
      printf("The coordinate point (%d, %d) lies in the Third quandrant.\n",co1,co2);
   }
   else if( co1 > 0 && co2 < 0)
   {
      printf("The coordinate point (%d,%d) lies in the Fourth quandrant.\n",co1,co2);
   }
   else if( co1 == 0 && co2 == 0)
   {
      printf("The coordinate point (%d,%d) lies at the origin.\n",co1,co2);
   }
}
```

Input & Output-

```
Input the values for X and Y coordinate : 3
-3
The coordinate point (3,-3) lies in the Fourth quandrant.
```

Programme 15: WAP in C to find gross salary of employee if DA is 40% of basic salary & HRA is 20% of basic salary. (User Input: Basic Salary)

```
#include <stdio.h>
int main() {
   float basicSalary, grossSalary, da, hra;

   // User input of basic salary
   printf("Enter the basic salary: ");
   scanf("%f", &basicSalary);

   // Calculating DA
   da = 0.4 * basicSalary;

   // Calculating HRA
   hra = 0.2 * basicSalary;

   // Calculating gross salary
   grossSalary = basicSalary + da + hra;

   // Display the gross salary
   printf("Gross Salary = %f\n", grossSalary);
   return 0;
}
```

Input & Output-

```
Enter the basic salary: 100000
Gross Salary = 160000.000000
```

Programme 16: WAP in C to calculate & print the Electricity bill of a given customer. (User Input: customer id & unit consumed by the user) Also display the total amount to pay to the customer.

Upto 199 ----- 1.20

200-500 ------ 1.80

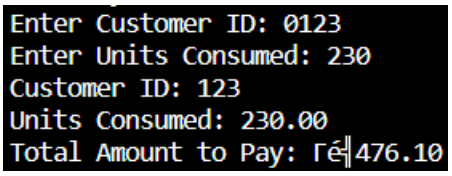
Above 500 --- 2.00

If bill exceeds ₹ 400 then surcharge of 15% will be charged and the minimum bill should be of ₹ 100/-

```
#include <stdio.h>
int main(void)
{
   int customerID;
   float unitsConsumed, totalAmount, surcharge = 0.0;


   printf("Enter Customer ID: ");
   scanf("%d", &customerID);

   printf("Enter Units Consumed: ");
   scanf("%f", &unitsConsumed);


   if (unitsConsumed < 0) {
      printf("Invalid input. Units consumed cannot be negative.\n");
   } else {
      if (unitsConsumed <= 199)
         totalAmount = unitsConsumed * 1.20;
      else if (unitsConsumed >= 200 && unitsConsumed <= 500)
         totalAmount = unitsConsumed * 1.80;
      else
         totalAmount = unitsConsumed * 2.00;


      if (totalAmount > 400)
         surcharge = totalAmount * 0.15;


      totalAmount += surcharge;

      // Minimum bill of ₹100
```

```
    if (totalAmount < 100)
        totalAmount = 100;


    printf("Customer ID: %d\n", customerID);
    printf("Units Consumed: %.2f\n", unitsConsumed);
    printf("Total Amount to Pay: ₹%.2f\n", totalAmount);
  }
}
```

Input & Output-



Programme 17: A library charges a fine for every book returned late. For first 5 days the fine is 50 p, for 6-10 days, fine is ₹1 and above 10 days, fine is ₹5. If you return the book after 30 days your membership will be cancelled. WAP in C to accept the number of days the member is late to return the book and display the fine or appropriate message.

```
#include <stdio.h>
int main(void) {
   int daysLate;
   float fine = 0.0;


   printf("Enter the number of days the book is late: ");
   scanf("%d", &daysLate);


   if (daysLate <= 0) {
      printf("No fine. The book is returned on time.\n");
   } else if (daysLate <= 5) {
      fine = 0.50 * daysLate;
      printf("Fine: ₹%.2f\n", fine);
   } else if (daysLate <= 10) {
      fine = 2.50 + (daysLate - 5) * 1.00;
      printf("Fine: ₹%.2f\n", fine);
   } else if (daysLate <= 30) {
      fine = 7.50 + (daysLate - 10) * 5.00;
      printf("Fine: ₹%.2f\n", fine);
   } else {
      fine = 7.50 + (daysLate - 10) * 5.00;
      printf("Fine: ₹%.2f\n", fine);
      printf("Your membership is cancelled as the book is returned after 30 days.\n");
   }
}
```

Input & Output-

```
Enter the number of days the book is late: 31
Fine: ₹112.50
Your membership is cancelled as the book is returned after 30 days.
```

Programme 18: **WAP in C to find the factorial of any number**

```
#include <stdio.h>
int main(void)
{
   int i,fact=1,number;
   printf("Enter a number: ");
   scanf("%d",&number);

   for(i=1;i<=number;i++)
   {
      fact=fact*i;
   }
   printf("Factorial of %d is: %d",number,fact);
}
```

Input & Output-

```
Enter a number: 5
Factorial of 5 is: 120
```

Programme 19: WAP in C to print Fibonacci sequence 0 1 1 2 3 5 8 13 …. N terms & print the sum of the sequence

```
#include <stdio.h>
int main(void) {
   int n, t1 = 0, t2 = 1, next_term = 0, sum = 0;
   printf("Enter the number of terms: ");
   scanf("%d", &n);


   if (n < 2) {
      printf("The number of terms should be at least 2.\n");
      return 1; // Exit the Programme with an error code.
   }


   printf("Fibonacci Sequence: ");
   for (int i = 1; i <= n; ++i) {
      // Prints the first two terms.
      if (i == 1) {
         printf("%d ", t1);
         continue;
      }
      if (i == 2) {
         printf("%d ", t2);
         continue;
      }
      next_term = t1 + t2;
      t1 = t2;
      sum += next_term;
      t2 = next_term;

      // Prints the next term.
      printf("%d ", next_term);
   }
   // Calculates the sum of the sequence.

   sum = sum + 1;
   printf("\nSum of Sequence: %d", sum);
}
```

<u>Input & Output-</u>

```
Enter the number of terms: 10
Fibonacci Sequence: 0 1 1 2 3 5 8 13 21 34
Sum of Sequence: 88
```

Programme 20: WAP in C to accept an integer number & find sum of its digits

```
#include <stdio.h>

int main(void)

{

   int number, sum = 0, digit;

   printf("Enter an integer number: ");

   scanf("%d", &number);


   // Calculate the sum of digits

   while (number != 0)

   {

      digit = number % 10;

      sum += digit;

      number /= 10;

   }

   printf("The sum of the digits is: %d\n", sum);

}
```

Input & Output-

```
Enter an integer number: 25
The sum of the digits is: 7
```

Programme 21: WAP in C to display first letter of your name in terms of # using loop

```
#include <stdio.h>
int main(void)
{
   int H, W;
   printf("Enter the height of the letter I: ");
   scanf("%d", &H);


   if (H < 3)
   {
      printf("The height must be at least 3 to display the letter I.\n");
   }
   else
   {
      W = H % 2 == 0 ? H + 1 : H;

      for (int i = 1; i <= H; i++)
      {
         for (int j = 1; j <= W; j++)
         {
            if (j == (W/2) + 1 || i == 1 || i == H)
            {
               printf("#");
            }
            else
            {
               printf(" ");
            }
         }
         printf("\n");
      }
   }
}
```

Input & Output-