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| --- |
| **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: ");

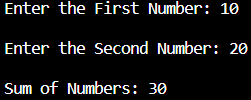
    scanf("%d",&B);

    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: ");

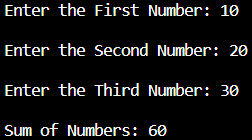
    scanf("%d",&C);

    sum = A + B + C;

    printf("\nSum of Numbers: %d",sum);

}

**Input & Output-**



**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-**



**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: ");

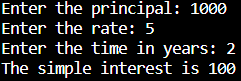
    scanf("%d", &T);

    SI = (P\*R\*T)/ 100;

    printf("The simple interest is %d", SI);

}

**Input & Output-**



**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: ");

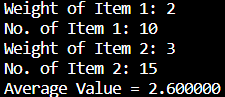
    scanf("%lf", &N2);

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

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

}

**Input & Output-**



**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;

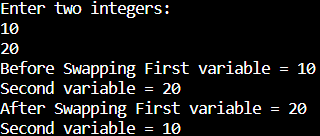
    a = b;

    b = temp;

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

}

**Input & Output-**



**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;

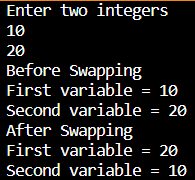
    b = a - b;

    a -= b;

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

}

**Input & Output-**



**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-**



**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));

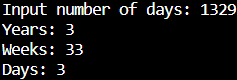
    printf("Years: %d\n", Y);

    printf("Weeks: %d\n", W);

    printf("Days: %d \n", D);

}

**Input & Output-**



**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-**



**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-**



**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

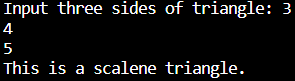
    {

        printf("This is a scalene triangle.\n");

    }

}

**Input & Output-**



**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);

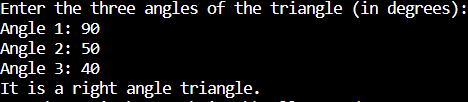
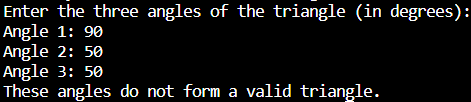
    // Check if the sum of angles is 180 degrees (valid triangle)

    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-**

** **

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

#include<stdio.h>

int main()

{

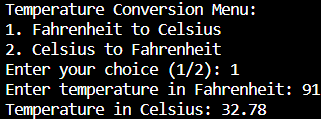
    int choice;  
    float temperature, convertedTemperature;

    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-**



**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-**



**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-**



**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-**



**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

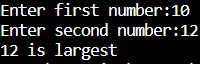
    {

        printf("%d is largest", b);

    }

}

**Input & Output-**



**Programme 12: WAP in C to implement Simple Calculator**

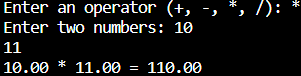
#include <stdio.h>  
int main(void)  
{  
    char op;  
    double a, b;  
    printf("Enter an operator (+, -, \*, /): ");  
    scanf(" %c", &op);  
    printf("Enter two numbers: ");  
    scanf("%lf %lf", &a, &b);

    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-**



**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-**



**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-**



**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-**



**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);

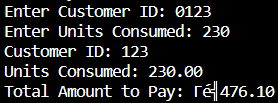
    if (unitsConsumed < 0) {  
        printf("Invalid input. Units consumed cannot be negative.\n");  
    } else {  
        if (unitsConsumed <= 199)  
            totalAmount = unitsConsumed \* 1.20;  
        else if (unitsConsumed >= 200 && unitsConsumed <= 500)  
            totalAmount = unitsConsumed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



**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-**



**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");  
 }

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);  
}

**Input & Output-**



**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-**



**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-**

