

Rajshahi University of Engineering & Technology

Department of Civil Engineering

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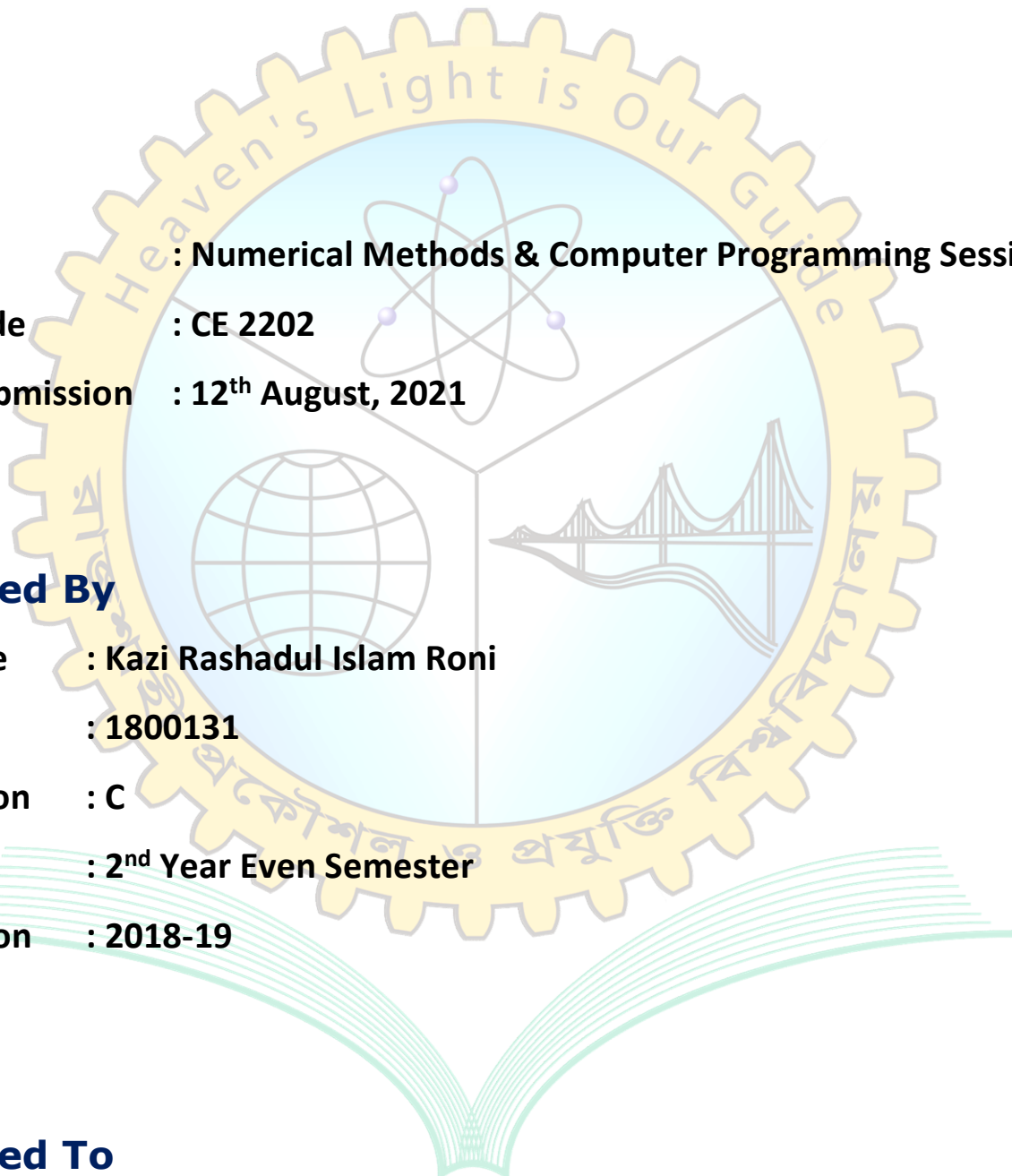
Submitted By

Name : Kazi Rashadul Islam Roni
Roll : 1800131
Section : C
Class : 2nd Year Even Semester
Session : 2018-19

Submitted To

Mahmud Hasan
Lecturer

Department of Civil Engineering



01. Program Name: Write a program to determine the surface area and cross sectional area of a cylinder.

Solution:

```
#include <stdio.h>
#include <math.h>
int main()
{
    float r, h, CSA, SA;
    printf("Enter the value of radius, r = ");
    scanf("%f", &r);
    printf("Enter the value of height, h = ");
    scanf("%f", &h);

    CSA = 3.1416 * r * r;
    SA = 2 * 3.1416 * r * h;
    printf("The cross sectional area is = %f\n", CSA);
    printf("The surface area is = %f\n", SA);
    return 0;
}
```

Input:

Enter the value of Radius, r =

Enter the value of height, h =

Output:

The cross-sectional area is = 2

The surface area is =

02. Program Name: Write a program to determine the perimeter and area of a triangle.

Solution:

```
#include <stdio.h>
#include <math.h>
int main()
{
    float a, b, c, perimeter, s, area;
    printf("Enter the arm value of a, b, c: ");
    scanf("%f%f%f", &a, &b, &c);
    if (a+b > c && b+c > a && a+c > b)
    {
        perimeter = a+b+c;
        printf("The Perimeter is = %f \n", perimeter);
        s = perimeter/2;
        area = sqrt(s*(s-a)*(s-b)*(s-c));
        printf("The area of the triangle is = %f", area);
    }
    else
    {
        printf("It is impossible to form triangle");
    }
}
```

Input:

Enter the value of a, b, c : 4

5

6

Output:

The perimeter of the triangle is 15.00

The area of the triangle is 9.921567

03. Program Name: Write a program to determine the cross-sectional area of a circle.

Solution:

```
#include <stdio.h>
#include <math.h>
int main()
{
    float radius, area;
    printf("Enter the Radius of the circle: \n");
    scanf("%f", &radius);
    area = 3.1416 * pow(radius, 2);
    printf("\n Area of the circle = %f", area);
    return 0;
}
```

Input:

Enter the Radius of the circle:
4

Output:

Area of the circle = 50.265598

04. Programme Name: Write a program to determine the cross-sectional area and surface area of a sphere.

Solution:

```
#include <stdio.h>
#include <math.h>
int main()
{
    float r, CSA, SA;
```

```

printf("Enter the radius of the sphere: ");
scanf("%f", &r);
CSA = 3.1416 * r * r;
printf("\n Area of the sphere is : %f \n", CSA);
SA = 4 * 3.1416 * r * r;
printf("\n surface area of the sphere is : %f \n", SA);
return 0;
}

```

Input:

Enter the radius of the sphere: 5

Output:

Area of the sphere is: 78.540001

Surface Area of the sphere is: 314.160004

05. Program Name: Write a program to determine the root of quadratic equation $ax^2 + bx + c = 0$

Solution:

```

#include <stdio.h>
#include <math.h>
int main()
{
    float a, b, c, d, r1, r2;
    printf("Enter 3 constant of Quadratic equation: \n");
    scanf("%f%f%f", &a, &b, &c);
    d = (pow(b, 2)) - (4 * a * c);
    if (d >= 0)
    {
        r1 = (-b + sqrt(d)) / (2 * a);

```

```

    r2 = (-b - sqrt(d)) / (2 * a);
    printf("\n The Roots are: \n R1 = %f \n R2 = %f", r1, r2);
}
else
{ printf("The roots are complex"); }
return 0;
}

```

Input:

Enter 3 constant of Quadratic equation:

1
-5
6

Output:

The roots are:

R1 = 3.0000

R2 = 2.0000

06. Program Name: Write a ~~program~~ program to show the number position of 4-digit number.

Solution:

```

#include <stdio.h>
#include <math.h>
int main()
{
    int a, b, c, d, n;
    printf("Enter a 4 digit Number: ");
    scanf("%d", &n);
    a = (n % 10000) / 1000;
    b = (n % 1000) / 100;

```

```

c = (n%1000)/10;
d = (n%10)/1;
printf("In The 1st Digit is: %d", a);
printf("In The 2nd Digit is: %d", b);
printf("In The 3rd Digit is: %d", c);
printf("In The 4th Digit is: %d", d);
return 0;
}

```

Input:

Enter a 4 digit Number: 6473

Output:

The 1st Digit is: 6
 The 2nd Digit is: 4
 The 3rd Digit is: 7
 The 4th Digit is: 3

07. Program Name: Write a program to show input number is reverse order.

Solution:

```

#include <stdio.h>
#include <math.h>
int main()
{
  int a, b, c, d, e, f;
  printf("Enter a 4 digit Number: ");
  scanf("%d", &a);
  b = (a%10000)/1000;
  c = (a%1000)/100;
  d = (a%100)/10;

```

```

e = (a%10)/1;
f = (b) + (e*10) + (d*100) + (e*1000);
printf("\n The Reverse Order is: %d", f);
return 0;
}

```

Input:

Enter a 4 Digit Number: 5678

Output:

The Reverse order is: 8765

Q8.a. Program Name: Write a program to convert the temperature celsius to Fahrenheit.

Solution:

```

#include <stdio.h>
#include <math.h>
int main()
{
    float F, C;
    printf("Enter the value of C = ");
    scanf("%f", &C);
    F = ((C*9)/5) + 32;
    printf("The temperature in celsius Fahrenheit = %.2f\n", F);
    return 0;
}

```

Input:

Enter the value of C = 35

Output:

The temperature in Fahrenheit = 95.00

08.b. Program Name: Write a program to convert the temperature Fahrenheit to Celsius.

Solution:

```
#include <stdio.h>
#include <math.h>
int main()
{
    float F, C;
    printf("Enter the value of F = ");
    scanf("%f", &C);
    C = (5*(F-32))/9;
    printf("The temperature in celsius = %.2f\n", C);
    return 0;
}
```

Input:

Enter the value of F = 97

Output:

The temperature in Celsius = 36.11

09. Program Name: Write a program to compute midpoint given the co-ordinate of the points.

Solution:

```
#include <stdio.h>
#include <math.h>
int main()
{
    float x, y, x1, y1, x2, y2;
    printf("Enter the 1st Co-ordinate point: ");
    scanf("%f%f", &x1, &y1);
    printf("Enter the 2nd Co-ordinate point: ");
```

```
scanf("%f%f", &x2, &y2);
```

```
x = (x1 + x2) / 2;
```

```
y = (y1 + y2) / 2;
```

```
printf("The co-ordinate of midpoint are: (%f,%f)", x, y);
```

```
return 0;
```

```
}
```

Input:

Enter 1st co-ordinate point: 4

4

Enter 2nd co-ordinate point: 4

4

Output:

The co-ordinate of midpoint are: (4.0000, 4.0000);

10. Program Name: A point on the circumference of a circle whose center is (0,0) and (4,5). Write a program to compute perimeter and area of circle.

Solution:

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

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

```
int main()
```

```
{
```

```
float a, P, r, n
```

```
r = sqrt(pow((4-0), 2) + pow((5-0), 2));
```

```
r = sqrt(r);
```

```
P = 2 * 3.1416 * r;
```

```
a = 3.1416 * pow(r, 2);
```

```
printf("The perimeter of the circle is: %f", P);
```

```
printf("\n The Area of the circle is: %f", a);
```

```
return 0;
```

```
}
```

Output:

The perimeter of the circle is: 40.232109

The area of the circle: 128.805603

11. Program Name: Write a program to find the attendance marks according to the percentage of days present using the following table using else if ladder.

Solution:

```
#include <stdio.h>
#include <math.h>
int main()
{
    int a;
    printf("Enter the percentage of days present:");
    scanf("%d", &a);
    if (a > 100)
    {
        printf("you have entered invalid number.");
    }
    else if (a >= 80 && a <= 100)
    {
        printf("Your Letter Grade is A+ \n");
        printf("Your Grade point is 4.00");
    }
    else if (a >= 75 && a < 80)
    {
        printf("Your Letter Grade is A \n");
        printf("Your Grade point is 3.75");
    }
    else if (a >= 70 && a < 75)
    {
        printf("Your Letter Grade is A- \n");
    }
}
```

```

printf("Your Grade point is 3.50");
}
else if (a >= 65 && a < 70) {
    printf("Your Letter Grade is B+ \n");
    printf("Your Grade point is 3.25");
}
else if (a >= 60 && a < 55) {
    printf("Your Letter Grade is B \n");
    printf("Your Grade point is 3.00");
}
else if (a >= 55 && a < 50) {
    printf("Your Letter grade is B- \n");
    printf("Your Grade point is 2.75");
}
else if (a >= 50 && a < 45) {
    printf("Your Letter grade is C+");
    printf("Your Grade point is 2.50");
}
else if (a >= 45 && a < 40) {
    printf("Your Letter Grade is C \n");
    printf("Your Grade point is 2.25");
}
else if (a >= 40 && a < 35) {
    printf("Your Letter Grade is D \n");
    printf("Your grade point is 2.00");
}

```

```

else if (a >= 0 && a < 40)
{
    printf("Your Letter grade is F\n");
    printf("Your Grade point is 0.00");
}
else
{
    printf("Sorry, You have entered an ivalid number.");
}

```

Input:

Enter the percentage of days present: 65

Output:

Your Letter Grade is B⁺
 Your Grade point is 3.25

12. Program Name: Write a program to find the attendance marks according to the percentage of days present using the following table using else if ladder.

Solution:

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

```
int main()
```

```

{
    int a;
    printf("Enter the percentage of days present: ");
    scanf("%d", &a);
    if (a > 100)
    {
        printf("You have entered invalid number.");
    }
    else if (a >= 90 && a <= 100)
    {
        printf("Your Marks is 10%");
    }
}

```

```

else if (a >= 85 && a < 90)
{ printf("Your marks is 9%"); }
else if (a >= 80 && a < 85)
{ printf("Your marks is 8%"); }
else if (a >= 75 && a < 80)
{ printf("Your marks is 7%"); }
else if (a >= 70 && a < 75)
{ printf("Your marks is 6%"); }
else if (a >= 65 && a < 70)
{ printf("Your marks is 5%"); }
else if (a >= 60 && a < 65)
{ printf("Your marks is 4%"); }
else if (a >= 0 && a < 60)
{ printf("Your marks is 0%"); }
else
{ printf("Sorry, you have entered an invalid number."); }
}

```

Input:

Enter the percentage of days present: 87

Output:

Your mark is 9

13. Program Name: Display equation of a line in the form $ax+by+c$ for $a=5, b=8, c=18$.

Solution:

```

#include <stdio.h>
#include <math.h>
int main()

```

```

{
    int a, b, c;
    a = 5;
    b = 8;
    c = 18;
    printf("The equation is : %dx + %dy = %d", a, b, c);
    return 0;
}

```

Output:

The equation is: $5x + 8y = 18$

14. Program Name: The line joining the point (2,2), (5,6) which lie on the circumference of a circle is the diameter of circle. Write a program to compute area and perimeter.

Solution:

```

#include <stdio.h>
#include <math.h>
#define PI 3.1416
int main()
{
    int x1 = 2, y1 = 2, x2 = 5, y2 = 6;
    float r, perimeter, area;
    d = sqrt(pow((x1 - x2), 2) + pow((y1 - y2), 2));
    r = d / 2;
    perimeter = 2 * PI * r;
    area = PI * r * r;
    printf("The perimeter = %.2f\n", perimeter);
}

```

```
printf("The area=%.2f\n", area);
}
```

Output:

The perimeter = 15.71

The area = 19.64

15. Program Name: Write a program to find out the sum of $1! + 2! + 3! + \dots + n!$

Solution:

```
#include <stdio.h>
int main()
{
    int n, sum, fact, i;
    printf("Enter number: ");
    scanf("%d", &n);
    sum = 0;
    fact = 1;
    for(i=1; i<=n; i++)
    {
        fact = fact * i;
        sum = sum + fact;
        if(i != n)
        { printf("%d! + ", i); }
        else
        { printf("%d! = ", i); }
    }
    printf("%d", sum); }
```

Input: Enter number: 4

Output: $1! + 2! + 3! + 4! = 33$

15. Program Name: Write a program to find out the factorial of an integer number $n!$.

Solution:

```
#include <stdio.h>
int main()
{
    int i, n, fact=1;
    printf("Enter number: ");
    scanf("%d", &n);
    for(i=1; i<=n; i++)
    {
        fact = fact * i;
    }
    printf("%d", fact);
    return 0;
}
```

Input:

Enter number : 4

Output:

24

17. Program Name: Write a program to find leap year

Solution:

```
#include <stdio.h>
int main()
{
    int year;
    printf("Enter year: ");
    scanf("%d", &year);
    if((year%4==0)&&((year%400==0)|| (year%100!=0)))
    {
        printf("This is Leap year");
    }
    else { printf("This is not Leap year"); }
}
```

Input:

Enter year: 1990

Output:

This is not Leap year.

18. Program Name: Write a program to find out smallest & largest number.

Solution:

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

```
int main()
```

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

```
    printf("Enter 1st Number: ");
```

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

```
    printf("Enter 2nd Number: ");
```

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

```
    printf("Enter 3rd Number: ");
```

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

```
// Greatest
```

```
if (a > b && a > c)
```

```
{ printf("%d is the Greatest\n", a); }
```

```
else if (b > a && b > c)
```

```
{ printf("%d is the Greatest\n", b); }
```

```
else { printf("%d is the Greatest\n", c); }
```

```
// Lowest
```

```
if (a < b && a < c)
```

```
{ printf("%d is the Lowest\n", a); }
```

```

else if (b < a && b < c)
{printf("%d is the Lowest\n")
else
{printf("%d is the Lowest\n", c);}
}

```

Input:

Enter 1st Number: 4

Enter 2nd Number: 9

Enter 3rd Number: 3

Output:

9 is the Greatest

3 is the Lowest

19. Program Name: Write program for $1! + 3! + 5! + \dots + (2n-1)!$

Solution:

```

#include <stdio.h>
int main()
{
    int sum, fact, i, j, n;
    printf("Enter your Number: ");
    scanf("%d", &n);
    sum = 0;
    for (i = 1; i <= n; i = i + 2)
    {
        fact = 1;
        for (j = 1; j <= i; j++)
        {
            fact = fact * j;
        }
        sum = sum + fact;
    }
    printf("Sum = %d", sum);
}

```

Input:

Enter your Number: 5

Output:

Sum = 127

20. Program Name: Write program $2! + 4! + 6! + \dots + (2n)!$

Solution:

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

```
int main()
```

```
{
```

```
    int sum, fact, i, j, n;
```

```
    printf("Enter your Number: ");
```

```
    scanf("%d", &n);
```

```
    sum = 0;
```

```
    if (n % 2 == 0)
```

```
    { for (i = 2; i <= n; i = i + 2)
```

```
        { fact = 1;
```

```
          for (j = 1; j <= i; j++)
```

```
          { printf fact = fact * j; }
```

```
          sum = sum + fact;
```

```
        }
```

```
        printf("Sum = %d", sum); }
```

```
    else
```

```
    { printf("Enter Even Number"); }
```

```
    return 0;
```

```
}
```

Input:

Enter your Number: 6

Output:

Sum = 746

21. Program Name: Write program for $2^2 + 4^2 + 6^2 + \dots + (2n)^2$

Solution:

```
#include <stdio.h>
int main()
{
    int i, n, sum;
    printf("Enter Number: ");
    scanf("%d", &n);
    sum = 0;
    for(i = 1; i <= n; i = i + 2)
    {
        sum = sum + pow(i, 2);
    }
    printf("Sum = %d", sum);
    return 0;
}
```

Input:

Enter Number: 7

Output:

Sum = 56

22. Program Name: Write program $1^2 + 3^2 + 5^2 + \dots + (2n-1)^2$

Solution:

```
#include <stdio.h>
int main()
{
    int i, n, sum;
    printf("Enter number: ");
    scanf("%d", &n);
    sum = 0;
    for(i = 1; i <= n; i = i + 2)
    {
        sum = sum + pow(i, 2);
    }
    printf("Sum = %d", sum);
    return 0;
}
```

Input:

Enter Number: 6

Output:

Sum = 35

23. Program Name: $\frac{2^2}{3^3} + \frac{4^2}{5^3} + \frac{6^2}{7^3} + \dots + \frac{(2n)^2}{(2n+1)^3}$

Solution:

```
#include <stdio.h>
#include <math.h>
int main()
{
    float i, sum, n;
    printf("Enter Number: ");
    scanf("%f", &n);
    sum = 0;
    for (i = 2; i <= n; i = i + 2)
    {
        sum = sum + pow(i, 2) / pow((i + 1), 3);
    }
    printf("Sum = %f", sum);
    return 0;
}
```

Input:

Enter Number: 7

Output:

Sum = 0.381104

24. Program Name: Write a program that reads positive integer ≤ 50 and calculate $\frac{1}{1^2} + \frac{3}{2^2} + \frac{5}{3^2} + \frac{7}{4^2} + \dots + \frac{2n-1}{n^2}$

Solution:

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

int main()
{
    float i, sum, n;
    printf("Enter Number: ");
    scanf("%f", &n);
    sum = 0;
    if (n <= 50)
    {
        for (i = 1; i <= n; i++)
        {
            if (i == 4)
                continue;
            sum = sum + ((2*i-1)/pow(i,2));
        }
        printf("Sum = %f", sum);
    }
    else
    {
        printf("Enter value less than 50");
    }
    return 0;
}
```

Input:

Enter Number: 39

Output:

Sum = 6.449968

25. Program Name: $\frac{1}{1!} + \frac{3}{3!} + \frac{5}{5!} + \dots + \frac{2n-1}{(2n-1)!}$

Solution:

```
#include <stdio.h>
#include <math.h>
int main()
{
    float i, j, sum, fact, n;
    printf("Enter Number: ");
    scanf("%f", &n);
    sum = 0;
    for (i = 1; i <= n; i = i + 2)
    {
        fact = 1;
        for (j = 1; j <= i; j++)
        {
            fact = fact * j;
        }
        sum = sum + (i / fact);
    }
    printf("Sum = %f", sum);
    return 0;
}
```

Input:

Enter Number: 8

Output:

Sum = 1.543056

26. Program Name: Write program for $\frac{1}{1!} + \frac{1}{3!} + \frac{1}{5!} + \dots + \frac{1}{27!}$

Solution:

```
#include <stdio.h>
#include <math.h>
int main()
{
    float i, j, sum, fact;
    sum = 0;
```

```

for (i=1; i<=27; i=i+2)
{
    fact=1;
    for (j=1; j<=i; j++)
    { fact=fact*j; }
    sum = sum + (1/fact);
}
printf("Sum=%f", sum);
return 0;
}

```

Output:

Sum = 1.175201

27. Program Name: Using do...while loop limit prints the numbers less than 100 which are dividable by 6.

Solution:

```

#include <stdio.h>
int main()
{
    int i=1
    do
    {
        if (i%6==0)
        { printf("\n Values = %d", i); }
        i++; }
    while (i<100);
    return 0;
}

```

Output:

Values = 6

Values = 12

Values = 18

Values = 24
Values = 30
Values = 36
Values = 42
Values = 48
Values = 54
Values = 60
Values = 66
Values = 72
Values = 78
Values = 84
Values = 90
Values = 96

28. Program Name: Write a program to count the number and sum of all integers greater than 50 and less than 250 that are divided by 7.

Solution:

```
#include <stdio.h>
#include <math.h>
int main()
{
    int i, count, sum;
    count = 0;
    sum = 0;
    for (i = 51; i < 250; i++)
    {
        if (i % 7 == 0)
        {
            count++;
            sum = sum + i;
        }
    }
}
```

```

printf("Count = %d", count);
printf("\nSum = %d", sum);
return 0;
}

```

Output:

Count = 28
Sum = 4214

29. Program Name: Write a program to calculate the average of n numbers and then compute the deviation using array.

Solution:

```

#include <stdio.h>
#include <math.h>
int main()
{
    int i, n, j;
    float sum = 0, mean, deviation, arr[100];
    printf("Enter number to be composed: ");
    scanf("%d", &n);
    for (i = 0; i < n; i++)
    {
        printf("Enter Individual Number: ");
        scanf("%f", &arr[i]);
    }
    for (i = 0; i < n; i++)
    {
        sum = sum + arr[i];
        mean = sum / n;
    }
    printf("\n Average = %f", mean);
}

```

```

for (i=0; i<n; i++)
{
    deviation = mean - arr[i];
    j = i+1;
    printf("\n Deviation of %d = %f", j, deviation);
}
return 0;
}

```

Input:

Enter number to be composed: 4

Enter Individual Number: 5

Enter Individual Number: 7

Enter Individual Number: 3

Enter Individual Number: 9

Output:

Average = 6.000000

Deviation of 1 = 1.000000

Deviation of 2 = -1.000000

Deviation of 3 = 3.000000

Deviation of 4 = -3.000000

30. Program Name: A class of 60 students take an experiment on CE-205 in which scores range for 0 to 100. Write a program to find highest score and number of failed.

Solution:

```

#include <stdio.h>
#include <math.h>
int main()

```

```

{ int i, n, highest, fail = 0;
  float arr[60];
  printf("Number of students: ");
  scanf("%d", &n);
  for (i = 0; i < n; i++)
  { printf("Enter Number score: ");
    scanf("%f", &arr[i]);
  }
  be high
  highest = arr[0];
  for (i = 1; i < n; i++)
  { if (arr[i] > highest)
    { highest = arr[i]; }
  }
  printf("\n Highest score = %d", highest);
  for (i = 0; i < n; i++)
  { if (arr[i] < 40)
    { fail = fail + 1; }
  }
  printf("\n Failed = %d", fail);
}

```

Input: Number of students: 5

Output: Enter score: 64
 Enter score: 88
 Enter score: 57
 Enter score: 35
 Enter score: 29

Output:

Highest = 88

Failed = 2

32. Program Name: Write a program using array to find Average of best three out of four class test marks.

Solution:

```
#include <stdio.h>
#include <math.h>
int main()
{
    int i, smallest, best_3, sum=0;
    float arr[4], avg;
    for(i=0; i<4; i++)
    {
        printf("Enter Marks of CT-%d:", i);
        scanf("%f", &arr[i]);
    }
    smallest = arr[0]
    for(i=1; i<4; i++)
    {
        if(arr[i] < smallest)
        {
            smallest = arr[i];
        }
    }
    for(i=0; i<4; i++)
    {
        sum = sum + arr[i];
    }
    best_3 = sum - smallest;
    avg = best_3 / 3;
    printf("\n Average = %f", avg);
}
```

Input:

Enter marks of CT-1 = 15

Enter marks of CT-2 = 17

Enter marks of CT-3 = 12

Enter marks of CT-4 = 16

Output:

Average = 16.000000

39. Program Name: 15 numbers are given.

1. find the largest value.
2. find the smallest value.
3. find no. of odd numbers.
4. find no. of even numbers.

Solution:

```
#include <stdio.h>
#include <math.h>
int main()
{
    int i, n, largest, smallest, odd, even, arr[15]
    printf("How many integer? : ");
    scanf("%d", &n);
    for(i=0; i<n; i++)
    {
        printf("Enter integer: ");
        scanf("%d", &arr[i]);
    }
    largest = arr[0]
    smallest = arr[0]
    odd = 0
    even = 0
```

```

for (i=1; i<n; i++)
{
    if (arr[i] > largest)
    { largest = arr[i]; }
    if (arr[i] < smallest)
    { smallest = arr[i]; }
}
for (i=0; i<n; i++)
{
    if (arr[i] % 2 == 0)
    { even++; }
    else
    { odd++; }
}
printf("\n Largest = %d", largest);
printf("\n Smallest = %d", smallest);
printf("\n Even = %d", even);
printf("\n Odd = %d", odd);
}

```

Input:

How many integer?: 5

Enter integer: 84

Enter integer: 32

Enter integer: 66

Enter integer: 73

Enter integer: 49

Output:

Largest = 84

Smallest = 32

Even = 3

Odd = 2

35. Program Name: Write a program using array for addition of two matrices.

Solution:

```
#include <stdio.h>
#include <math.h>
int main()
{
    int A[100][100], B[100][100], sum[100][100];
    int i, j, c, r;
    printf("\n How many Rows?: ");
    scanf("%d", &r);
    printf("\n How many columns?: ");
    scanf("%d", &c);
    printf("\n Enter elements of 1st matrix A: \n");
    for(i=0; i<r; i++)
    {
        for(j=0; j<c; j++)
        {
            printf("Enter Element A%d%d: ", i+1, j+1);
            scanf("%d", &A[i][j]);
        }
    }
    printf("\n Enter Enter elements of 2nd matrix B: \n");
    for(i=0; i<r; i++)
    {
        for(j=0; j<c; j++)
        {
            printf("Enter Element B%d%d:", i+1, j+1);
            scanf("%d", &B[i][j]);
        }
        printf("\n");
    }
    for(i=0; i<r; i++)
    {
        for(j=0; j<c; j++)
```

```

        { sum[i][j] = A[i][j] + B[i][j] ; }
    }
    for(i=0; i<r ; i++)
    { for(j=0; j<c ; j++)
        { printf("%d", sum[i][j]);
          if (j==c-1)
            { printf("\n"); }
        }
    }
}

```

Input:

How many rows? : 3

How many columns? : 2

Enter elements of 1st matrix A:

Enter element A11 = 5

Enter element A12 = 7

Enter element A21 = 3

Enter element A22 = 9

Enter element A31 = 3

Enter element A32 = 2

Enter elements of 2nd matrix B:

Enter element B11 = 6

Enter element B12 = 8

Enter element B21 = 3

Enter element B22 = 5

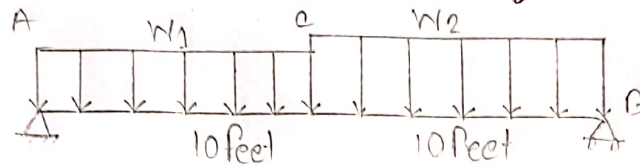
Enter element B31 = 4

Enter element B32 = 1

Output:

11	15
6	19
7	3

36. Program Name: Write a program to calculate shear force and bending moment at any point of the following beam.



Solution:

```
#include <stdio.h>
#include <math.h>
int main()
{
    float r1, r2, w1, w2, s, m, x;
    printf("Enter 1st distributed load = ");
    scanf("%f", &w1);
    printf("Enter 2nd distributed load = ");
    scanf("%f", &w2);
    printf("Enter the value of distance = ");
    scanf("%f", &x);
    r1 = (7.5 * w1) + (2.5 * w2);
    r2 = (7.5 * w2) + (2.5 * w1);
    printf("\n Reaction at point A, r1 = %f", r1);
    printf("\n Reaction at point B, r2 = %f", r2);
    if (x >= 0 && x <= 10)
    {
        s = r1 - (w1 * x);
        m = (r1 * x) - (w1 * x * x * 0.5);
        printf("\n\n Shear force at %f from left is = %f", x, s);
        printf("\n Bending moment at %f from left is = %f", x, m);
    }
    else if (x > 10 && x <= 20)
    {
        s = r1 - (w1 * 10) - (w2 * (x - 10));
        m = (r1 * x) - (w1 * (x - 5) * 10) - (w2 * (x - 10) * (x - 10) * 0.5);
    }
}
```

```

printf("\n\nshear force at %f from left is: %f", x, s);
printf("\nBending moment at %f from left is: %f", x, m);
}
else
{ printf("\n\nEnter a valid value of x");
}

```

Input:

Enter 1st distributed load = 8

Enter 2nd distributed load = 6

Enter the value of distance = 14

Output:

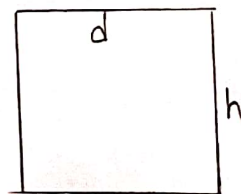
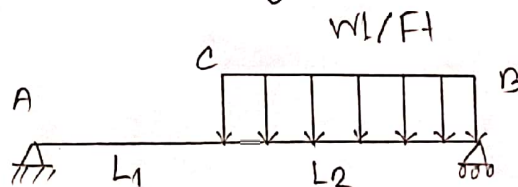
Reaction at point A, $r_1 = 75.000000$

Reaction at point B, $r_2 = 65.000000$

Shear force at 14.000000 from left is = -29.000000

Bending moment at 14.000000 from left is = 282.000000

38. Program-Name: Write a program to calculate shear force and bending moment, shearing stress stress and bending stress at any point for the following beam



Solution:

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

```
int main()
```

```
{ float r1, r2, w, b, h, l1, l2, q, i, v, m, ss, bs, x;
```

```
printf("Enter the distributed load = ");
```

```
scanf("%f", &w);
```

```

printf("Enter the value of distance = ");
scanf("%f", &x);
printf("Enter the value l1, l2 = \n");
scanf("%f %f", &l1, &l2);
printf("Enter the value b, h = \n");
scanf("%f %f", &b, &h);
r1 = (w * l2 * l2 * 0.5) / (l1 + l2);
r2 = (w * l2 * (l1 + (l2 * 0.5))) / (l1 + l2);
printf("\n The value of reaction r1 = %f, r2 = %f", r1, r2);
q = b * h * h * 0.5 * 0.25;
i = (b * h * h * h) / 12;
if (x < l1)
{
    v = r1;
    m = r1 * x;
    ss = (v * q) / (i * b);
    bs = (m * h * 0.5) / i;
}
else if (x >= l1 & & x <= l2)
{
    v = r1 - w * (x - l1);
    m = (r1 * x) - (w * (x - l1) * (x - l1) * 0.5);
    ss = (v * q) / (i * b);
    bs = (m * h * 0.5) / i;
}
printf("\n The value of shear force = %f, \n Bending
moment = %f, \n Shear stress = %f, \n Bending stress
= %f", v, m, ss, bs);
}

```

Input:

Enter the distributed load = 4

Enter the value of distance = 5

Enter the value $\lambda_1, \lambda_2 =$

6

5

Enter the value of $b, h =$

3

4

Output:

The value of reaction $R_1 = 4.545455, R_2 = 15.454545$

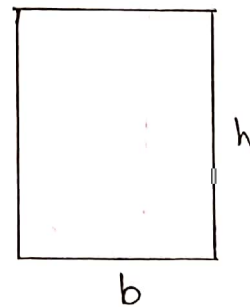
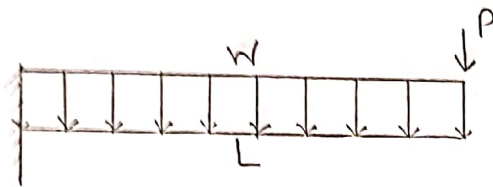
The value of shear force = 4.545455,

Bending moment = 22.727272,

Shear stress = 0.568182

Bending stress = 2.840909

40. Program Name: Write a program to find out shear force, bending moment, shearing stress, and flexural stress



Solution:

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

```
int main()
```

```
{ float p, w, l, b, h, i, c, q, s, f, v, m;
```

```
printf("Enter the value of point load, distributed load,  
length of span, breadth and height of the beam = \n");
```

```
scanf("%f%f%f%f%f", &p, &w, &l, &b, &h);
```

```
c = h/2;
```

```
i = (b*(h*h*h))/12;
```

```
q = b*(h/2)*(h/4);
```

```

V = P + (W * l);
m = (P * l) + (W * l * l) / 2;
S = (V * q) / (i * b);
f = (m * c) / i;
printf("Shear = %.2f, \n Moment = %.2f, \n Shearing stress = %.2f, \n Flexural stress = %.2f", V, m, S, f);
return 0;
}

```

Input:

Enter the value of point load, distributed load length of span, breadth and height of beam =

5
9
12
5
7

Output:

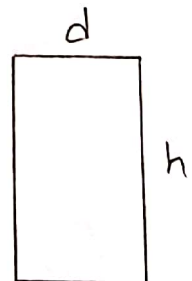
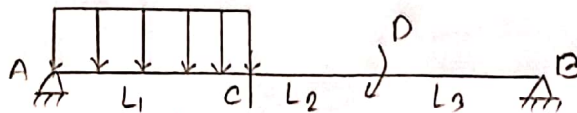
Shear = 53.00

Moment = 348.00

Shearing stress = 2.27

Flexural stress = 8.52

Q1. Program Name:



Solution:

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

```
int main()
```

```
{ float L1, L2, L3, w1, d, h, P1, c, l, q, x, v, m, bm, ss, bs;
```

```
printf("Enter value of L1, L2, L3, w1, m, d, h, x : \n");
scanf("%f%f%f%f%f%f%f", &L1, &L2, &L3, &w1, &m, &d,
      &h, &x);
```

```
c = h/2;
```

```
i = (d*(h*h*h))/12;
```

```
q = d*(h/2)*(h/a);
```

```
r1 = ((w1*L1)*((L2+L3)*L1*0.5)) - m/(L1+L2+L3);
```

```
if (x > 0 & x <= L1)
```

```
{
    v = r1 - w1*x;
```

```
bm = r1*x - w1*x*x*0.5;
```

```
ss = (v*q)/(i*b);
```

```
bs = (bm*c)/i;
```

```
}
```

```
else if (x > L1 & x < L2)
```

```
{
    v = r1 - w1*(x - L1);
```

```
bm = r1*x - w1*(x - L1)*L1*(x - L1/2);
```

```
ss = (v*q)/(i*b);
```

```
bs = (bm*c)/i;
```

```
}
```

```
else
```

```
{
    v = r1 - w1*L1;
```

```
bm = r1*x - w1*L1*L1*(x - L1/2) + m;
```

```
ss = (v*q)/(i*b);
```

```
bs = ((bm*c)/i);
```

```
}
```

```
printf("\nshear force = %f", v);
```

```
printf("\nBending moment = %f", bm);
```

```
printf("\nshearing stress = %f", ss);
```

```
printf("\nBending stress = %f", bs);
```

```
}
```

Input:

Enter value of $L_1, L_2, L_3, w_1, m, d, h, x$:

5

6

7

6

4

3

5

10

Output:

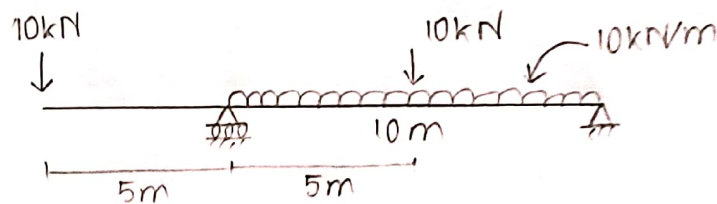
Shear force = 944.777771

Bending moment = 9526.777344

Shearing stress = 94.477783

Bending stress = 762.142212

42. Program Name: Write a program to calculate shear force, bending moment, shearing stress and flexural stress at anywhere of the following beam.



Solution:

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

```
int main()
```

```
{ float a, b, c, m, p, x, w, v, ss, flex, q, B, h, i, c, M;  
  printf("Enter the values of a, b, c, m, p, w, h, B, x\n");  
  scanf("%f%f%f%f%f%f%f%f", &a, &b, &c, &m, &p,  
    &w, &h, &B, &x);
```

```

ra = ((w * pow((a+b), 2)) - 2 * m - 2 * p * c) / (2 * (a+b));
rb = ((w * pow((a+b), 2)) + 2 * m + 2 * p * (a+b+c)) / (2 * (a+b));
if (x > 0 && x <= (a+b)/2)
{
    v = ra - (w * x);
    m = ra * x - ((w * x * x) / 2);
}
else if (x <= (a+b) && x >= (a+b)/2)
{
    v = ra - (w * x);
    m = ra * x - ((w * x * x) / 2) + m;
}
else if (x > (a+b) && x <= (a+b+c))
{
    v = ra - (w * (a+b)) + rb;
    m = ra * x + m + rb * (x - (a+b)) - (w * (a+b) * (x - ((a+b)/2)));
}
q = (b * h * h) / 8;
i = b * pow(h, 3) / 12;
c = h / 2;
flex = m * c / i;
ss = (v * q) / (i * B);
printf("At %f shear force is %f, \n Bending moment is %f, \n shear stress is %f \n Flexural stress is %f",
    x, v, m, ss, flex);
}

```

Input:

Input the values of a, b, c, m, p, w, h, B, x:

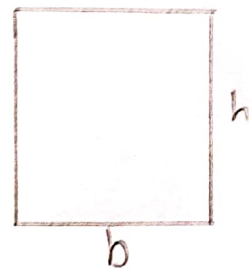
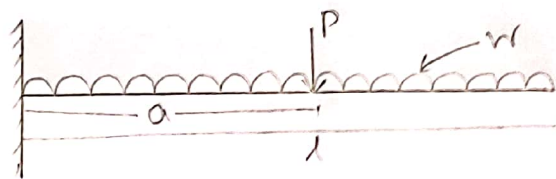
5
5
5
10
10
10
3

5
8

Output:

At 8.000000. Shear Force is -36.000000
Bending moment is 42.000000
Shear stress is -3.000000
Flexural stress is 4.444445

44. Program Name: Write a program to calculate shear force, bending moment, shearing stress and flexural stress of a beam as shown in figure below at every $L/10$ distance from support



Solution:

```
#include <stdio.h>
int main()
{
    float a, l, p, w, m, r, b, h, x, c, I, sf, bm, ss, fs;
    printf("Enter the value of a, l, p, w, b, h, x = \n");
    scanf("%f%f%f%f%f%f%f", &a, &l, &p, &w, &b, &h, &x);

    r = p + (w * l);
    m = (p * a) + (w * l * l * 0.5);
    c = h / 2;
    I = (b * h * h) / 12;
    sf = (x < a) ?
        for (x = 0; x < a; x = x + (l / 10))
```

```

{ sf = P - (w * x);
  bm = m + (P * x) - (w * x * x * 0.5);
  ss = (sf * Q) / (I * b);
  fs = (bm * c) / I;
  printf("\n Distance = %.2f, Shear force = %.2f, Bending
        moment = %.2f, Shearing stress = %.2f, Flexural stress
        = %.2f", x, sf, bm, ss, fs);
}

```

```

elseif(x >= a) {
  for(x = a; x <= 1; x = x + (1/10))
  { sf = P - P - (w * x);
    bm = m + (P * x) - (w * x * x * 0.5) - P * (x - a);
    ss = (sf * Q) / (I * b);
    fs = (bm * c) / I;
    printf("\n Distance = %.2f, Shear force = %.2f,
          Bending moment = %.2f, Shearing stress = %.2f, Flexural
          stress = %.2f", x, sf, bm, ss, fs);
  }
}

```

Input:

Enter the value of a, l, P, w, b, h, x =

2
3
4
4
3
5
3

Output:

Distance = 2.00, Shear force = 4.00, Bending moment = -2.00

Shearing stress = 0.400000, Flexural stress = 0.00

Distance = 2.30, Shear force = 2.80, Bending moment = -0.90

Shearing stress = 0.28, Flexural stress = 0.00

Distance = 2.60, Shear force = 1.60, Bending moment = -0.36

Shearing stress = 0.16, Flexural stress = 0.00

Distance = 2.90, Shear force = 0.40, Bending moment = -0.09

Shearing stress = 0.04, Flexural stress = 0.00

MMS

03. Program Name: Write a program to make a sample calculator to add, subtract, multiply and divide.

Solution:

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

```
int main()
```

```
{ char op;
```

```
double first, second;
```

```
printf("Enter an operator (+, -, *, /): ");
```

```
scanf("%c", &op);
```

```
printf("Enter two operands: ");
```

```
scanf("%lf%lf", &first, &second);
```

```
switch(op) {
```

```
case '+':  
    printf("%.1lf + %.1lf = %.1lf", first, second, first + second);
```

```
    break;
```

```
case '-':  
    printf("%.1lf - %.1lf = %.1lf", first, second, first - second);
```

```
    break;
```

```
case '*':  
    printf("%.1lf * %.1lf = %.1lf", first, second, first * second);
```

```
    break;
```

```
case '/':  
    printf("%.1lf / %.1lf = %.1lf", first, second, first / second);
```

```
    break;
```

```
default:
```

```
    printf("Error! Operator is not correct");
```

```
}}
```

Input:

Enter an operator (+, -, *, /): -

Enter two operands:

4
5

Output:

$$4.0 - 5.0 = -1.0$$

04. Program Name: Write a program for $100 \times 99 \times 98 \times \dots \times n$.

Solution:

```
#include <stdio.h>
int main()
{
    float n, i, h=1;
    printf("Input last number of series: \n");
    scanf("%f", &n);
    for (i=100; i >= n; i--)
        { h = h * i; }
    printf("%f", h);
    return 0;
}
```

Input:

Input last number of series:

90

Output:

5653407455784969700000.000000

06. Program Name: Write a program for $12 \times 14 \times 16 \times \dots \times n$.

Solution:

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

```
int main()
```

```
{
```

```
    float n, i, h=1
```

```
    printf("Input last number of series: ");
```

```

scanf("%f", &n);
for (i=12; i<=n; i=i+2)
    { h=h*i; }
printf("%f", h);
return 0;
}

```

Input: Input last number of series: 30

Output: 11158821011456.00000

08. Program Name: Write a program using array for sum, subtraction, multiplication and diagonal matrix of two matrix $A(3 \times 3)$ and $B(3 \times 3)$.

Solution:

```

#include <stdio.h>
int main()
{
    int A[3][3], B[3][3], sum[3][3], sub[3][3], multi[3][3],
    div[3][3];
    int i, j, rows, cols, add=0;
    printf("Enter the values of rows and columns = \n");
    scanf("%d%d", &rows, &cols);
    printf("Enter matrix A = \n");
    for (i=0; i<rows; i++)
    {
        for (j=0; j<cols; j++)
        {
            scanf("%d", &A[i][j]);
        }
    }
}

```

```

printf("Enter matrix B = \n");
for (i=0; i<rows; i++)
{
    for (j=0; j<cols; j++)
        { scanf("%d", &B[i][j]); }
}

```

```

printf("Addition = \n");
for (i=0; i<rows; i++)
{
    for (j=0; j<cols; j++)
        { sum[i][j] = A[i][j] + B[i][j];
          printf("%d\t", sum[i][j]); }
    printf("\n");
}

```

```

printf("Subtraction = \n");
for (i=0; i<rows; i++)
{
    for (j=0; j<cols; j++)
        { sub[i][j] = A[i][j] - B[i][j];
          printf("%d\t", sub[i][j]); }
    printf("\n");
}

```

```

printf("Multiplication = \n");
for (i=0; i<rows; i++)
{
    for (j=0; j<cols; j++)
        { multi[i][j] = A[i][j] * B[i][j];
          printf("%d", multi[i][j]); }
    printf("\n");
}

```

```

printf("Diagonal = \n");
for(i=0; i<rows; i++)
{
    for(j=0; j<cols; j++)
    {
        if(i==j)
        {
            add = add + A[i][j];
        }
    }
    printf("%d\n", add);
}
return 0;
}

```

Input:

Enter the value of rows and columns =

3
3

Enter matrix A =

4
5
6
5
6
7
6
7
8

Enter matrix B =

8
7
6
7
6
5
6
5
4

Output:

Addition:

12 12 12
12 12 12
12 12 12

Substtuction =

$$\begin{array}{rrr} -4 & -2 & 0 \\ -2 & 0 & 2 \\ 0 & 2 & 4 \end{array}$$

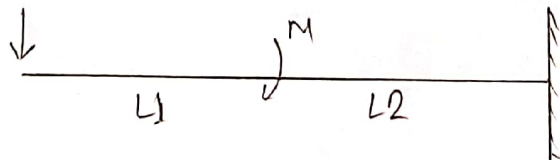
Multiplication =

$$\begin{array}{rrr} 32 & 35 & 36 \\ 35 & 36 & 35 \\ 36 & 35 & 32 \end{array}$$

Diagonal =

4
4
4

10. Program Name: Comput shear force, v and moment, M at $L/10$ distance



Solution:

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

```
int main()
```

```
{ float x, L, P, L1, L2, M, v, m;
```

```
printf("Enter value of P, L1, L2, M = \n");
```

```
scanf("%f%f%f%f", &P, &L1, &L2, &M);
```

```
L = L1 + L2;
```

```
for (x = 0; x <= 1; x = x + (L/10))
```

```
{ if (x <= L1)
```

```

    {
        v = -p;
        m = -p * x;
        printf("v at %.2f = %.2f\n", x, v);
        printf("m at %.2f = %.2f\n", x, m);
    }
    if (x > L1 && x <= (L1 + L2))
    {
        v = -p;
        m = (-p * x) + m;
        printf("v at %.2f = %.2f\n", x, v);
        printf("m at %.2f = %.2f\n", x, m);
    }
}
return 0;
}

```

Input:

Enter the values of p, L1, L2, M =

5
3
4
5

Output:

v at 0.00 = -5.00
m at 0.00 = -0.00
v at 0.70 = -5.00
m at 0.70 = -3.50
v at 1.40 = -5.00
m at 1.40 = -7.00
v at 2.10 = -5.00
m at 2.10 = -10.50
v at 2.80 = -5.00
m at 2.80 = -14.00