LAB FILE

Introduction To C Programming

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BCA 1ST YEAR

SUBMITTED BY ::

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Submitted To::

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1- Wap for hello world or this is my first c programing.

Input

```c
#include <stdio.h>

int main()
{
    printf("Hello World");

    return 0;
}
```

Output

```
Hello World

...Program finished with exit code 0
Press ENTER to exit console.
```

2 – WAP to add two numbers.

Input

```c
#include <stdio.h>

int main()
{
    int number1,number2,sum;
    printf("enter two integers:");
    scanf("%d %d",&number1,&number2);
    //calculate the sum
    sum=number1 + number2;
    printf("%d + %d = %d",number1,number2,sum);

    return 0;
}
```

Output

```
enter two integers:12
11
12 + 11 = 23

...Program finished with exit code 0
Press ENTER to exit console.
```

3-WAP to find area of circle.

Input

```c
#include <stdio.h>

int main(void)

{

float pie = 9.14;


int radius = 6;

printf("the radius of the circleis%d", radius);
float area = (float) (pie*radius*radius);


printf("the area of the given circle is%f", area); return 0;
}
```

output

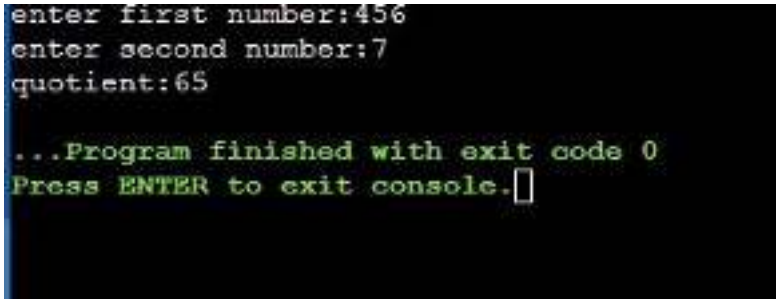
```
input
he radius of the circleis6the area of the given circle is329.040039

..Program finished with exit code 0
ress ENTER to exit console.
```

4-WAP to divide two numbers.

Input

```c
#include <stdio.h>

int main()
{
    int num1,num2,quotient;
    //asking for input
    printf("enter first number:");
    scanf("%d",&num1);
    printf("enter second number:");
    scanf("%d",&num2);
    //computing quotient
    quotient = num1/num2;
    printf("quotient:%d", quotient);
    return 0;

}
```

Output



6-WAP to print ASCII value.

Input

```c
#include <stdio.h>

int main()
{
    char c;
    printf("enter a character:");
    scanf("%c",&c);
    //%d displays the integer value of a character
    //%c displays the actual character
    printf("ascii value of %c=%d",c,c);

    return 0;

}
```

Output

```
enter a character:G
ascii value of G=71

...Program finished with exit code 0
Press ENTER to exit console.
```

7- WAP to multiply floating points number

Input

```c
#include<stdio.h>
int main()
{
    float a,b,c;
    a=11.23;b=6.7;
    c=(float)(a*b);
    //displaying result up to 3 decimal places.
    printf ("%3f",c);

    return 0;
}
```

Output


75.240997
...Program finished with exit code 0
Press ENTER to exit console.

8-

8- WAP to swap two variables numbersby using third variable.

Input

```c

// c program to swap two variables
#include<stdio.h>
//driver Code
int main()
{
    int x,y;
    printf("enter value of x");
    scanf("%d",&x);
    printf("\nenter value of y");
    scanf("%d",&y);
    //using a temporary variable to swap the values
    //store the value of x in a temporary variable
    int temp = x;
    //assign the value stored in the temporary variable to//temporary
    y = temp;
    printf("\nafter swapping :x=%d,y=%d",x,y);

    return 0;
}

```

Output

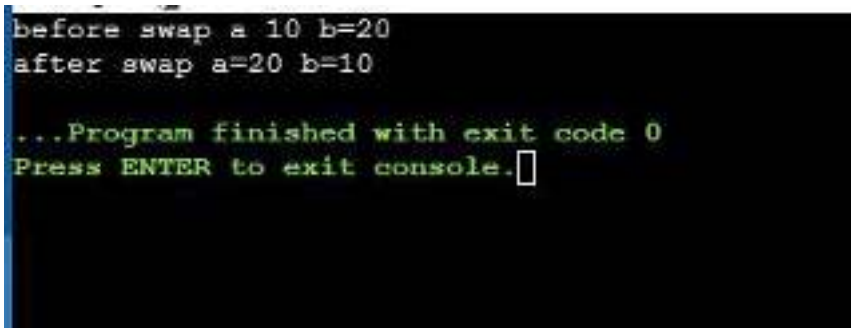
```
enter value of x
0

enter value of y0

after swapping :x=0,y=0

...Program finished with exit code 0
Press ENTER to exit console.
```

9-WAP to swap two variables numbers without using third variable.

Input

```c

// c program to swap two variables numbers without using third
#include<stdio.h>
int main()
{
    int a = 10,b=20;
    printf("before swap a %d b=%d",a,b);
    a=a+b;//a=30(10+20)
    b=a-b;//b=10(30-20)
    a=a-b;//a=20(30-10)
    printf("\nafter swap a=%d b=%d",a,b);
    return 0;
}

```

Output



10- WAP to swap three variable numbers without using third variables.

Input

10-

```c

// c program to swap three variables numbers without using third
#include<stdio.h>
int main()
{
    int num1,num2,num3;
    //input three numbers
    printf("enter the first number:");
    scanf("%d",&num1);
    printf("enter the second number:");
    scanf("%d",&num2);
    //swap the values without using the third variable
    num1=num1+num2+num3;
    num2=num1-(num2+num3);
    num3=num1-(num2+num3);
    num1=num1-(num2+num3);
    //display the swap values
    printf("after sw3apping :/n");
    printf("first number :%d\n",num1);
    printf("second number:%d\n",num2);
    printf("third number:%d\n",num3);

    return 0;
}

```

Output

```
enter the first number:14
enter the second number:45
after sw3apping :/nfirst number :0
second number:14
third number:45


...Program finished with exit code 0
Press ENTER to exit console.
```

11-

11-WAP to find the area of rectangle.

Input

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

int main()
{
    int length,breadth,area;
    printf("\nenter the length of rectangle:");
    scanf("%d",&length);
    printf("\nenter the breadth of rectangle:");
    scanf("%d",&breadth);
    area=length*breadth;
    printf("\narea of rectangle:%d",area);

    return 0;
}
```

Output

```
enter the length of rectangle:5

enter the breadth of rectangle:4

area of rectangle:20

...Program finished with exit code 0
Press ENTER to exit console.
```

12-WAP to find area of square.

Input

```c
#include <stdio.h>
int main()
{
    float side,area;
    printf("enter length of side of square\n");
    scanf("%f",&side);
    area=side*side;
    printf("area of square :%0.4f\n",area);
    return 0;
}
```

12-

Output

```
enter length of side of square
2.5
area of square :6.2500


...Program finished with exit code 0
Press ENTER to exit console.
```

13-WAP to find area of right angle triangle , isosceles triangle , any triangle with 3 sides.

Input

```c
/*
*c program to find area of a right angled triangle
*/
#include<stdio.h>
int main()
{
    float height,width;
    float area;
    printf("enter height and width of the given triangle:\n");
    scanf("%f%f",&height,&width);
    area=0.5*height*width;
    printf("area of right angled triangleis:%.3f\n",area);
    return 0;
}
```

Output

```
enter height and width of the given triangle:
10 15
area of right angled triangleis:75.000


...Program finished with exit code 0
Press ENTER to exit console.
```

13-

14- WAP to find area and volume of cube.

Input

```c
#include <stdio.h>

int main()
{
    int l,b,h,area,volume;
    printf("enter length");
    scanf("%d",&l);
    printf("enter breadth");
    scanf("%d",&b);
    printf("enter height");
    scanf("%d",&h);
    area=2*(l*b+b*h+h*l); //area of cuboid =2[lb+bh+hl]
    volume=(l*b*h);       //volume of cuboid=(l*b*h)
    printf("area:%.2d\n",area);
    printf("volume:%d\n",volume);
    return 0;
}
```

OUTPUT

```
enter breadth88
enter height99
area:%.0 2d
volume: 583704


...Program finished with exit code 0
Press ENTER to exit console.
```

15-WAP to find the largest number using the LOGICAL AND OPERATORS

INPUT

```c
// Online C compiler to run C

   #include <stdio.h>

int main()
{

     printf("My name is drishti\n");

    int a,b,c;
    printf("enter three number\n");
    scanf("%d%d%d",&a,&b,&c);

     if((a>b) && (a>c))
    printf("a is larger\n");

    else if((b>a) && (b>c))
     printf("b is larger\n");


     else
    printf("c is larger\n");

        return 0;

}
```

OUTPUT

```
/tmp/1yOixXXpge.o
My name is drishti
enter three number
34 35 36
c is larger
```

16-WAP to input the positive number from the user to perform left shift operator

INPUT

```c
// Online C compiler to run C program online

#include <stdio.h>
int main ()
{
    printf("my name is drishti juyal\n");
// declare local variable
int num;
printf (" Enter a positive number: ");

scanf (" %d", &num);
// use left shift operator to shift the bits
num = (num << 2); // It shifts two bits at the left side
printf (" \n After shifting the binary bits to the left side. ");
printf (" \n The new value of the variable num = %d", num);
return 0;
}
```

OUTPUT

```
/tmp/hFbcENRmtn.o
my name is drishti juyal
 Enter a positive number: 12
 After shifting the binary bits to the left
     side.
 The new value of the variable num = 48
```

17

WAP to perform the pre decrement and pre increment operator on two integers and print both original value and updated value

INPUT

```c
// Online C compiler
#include <stdio.h>
int main ()
{
    printf(" name  drishti juyal\n");
int a,b;
printf("original value is a:\n");
 scanf("%d",&b);
  printf("updated value of a=%d\n",a
      ++);
  printf("update2 a=%d",a);
  printf("original value is b:\n");
  scanf("%d",&b);
  printf("update value of b=%d\n",b--);
  printf("update2 a=%d",b);
    return 0;
}
```

OUTPUT

```
/tmp/dvFZoP5vDD.o
name  drishti juyal
original value is a:
56
updated value of a=0
update2 a=1original value is b:
34
update value of b=34
update2 a=33
```

18

character and print full gender single identify gender in WAP to

INPUT

```c
// Online C compiler to run C program
    online
#include<stdio.h>
int main()
{
    printf("name drishti juyal\n");
    char gender;
    printf("\n enter alphabet:");
    scanf("%c",&gender);

     if(gender=='M' || gender=='m')
     printf("gender:Male\n");
     else if (gender=='F' || gender
         =='f')
     printf("gender:female\n");
      else
      printf("other");
}
```

OUTPUT

```
/tmp/hFPAFBDIlr.o
name drishti juyal

 enter alphabet:f
 gender:female
```

19

WAP to input the positive number from the user to perform the Right shift operator

INPUT

```c
// Online C compiler to run C program online
#include <stdio.h>
int main ()
{
    printf("my name is drishti juyal\n");
// declare local variable
int num;
printf (" Enter a positive number: ");

scanf (" %d", &num);
// use left shift operator to right the bits
num = (num >> 2); // it shifts two bits at the right side
printf (" \n After shifting the binary bits to the right side. ");
printf (" \n The new value of the variable num = %d", num);
return 0;
}
```

OUTPUT

```
/tmp/KNJ9yuoOFd.o
my name is drishti juyal
 Enter a positive number: 13
 After shifting the binary bits to the right
     side.
The new value of the variable num = 3
```

20

WAP for an integer number and to check whether it is divisible by 9 or 7 using OR logical operator

INPUT

```c
// Online C compiler to run C program
    online
#include <stdio.h>

int main() {
    int number;
    printf("My name is Drishti Juyal");
    printf("Enter an integer: ");
    scanf("%d", &number);

    if (number % 9 == 0 || number % 7
        == 0) {
        printf("%d is divisible by 9 or
            7.\n", number);
    } else {
        printf("%d is not divisible by
            9 or 7.\n", number);
    }

    return 0;
}
```

OUTPUT

```
/tmp/Aw4vpxOCj2.o
My name is Drishti JuyalEnter an integer: 63
63 is divisible by 9 or 7.
```

21- WAP to perform the post increment and post decrement operator on two integers and print both original value and updated value

INPUT

```c
#include <stdio.h>
int main() {
    int num1, num2;
    printf ("my name is drishti juyal\n");
    printf("Enter two integers: ");
    scanf("%d %d", &num1, &num2);
    int result1 = num1++;
    int result2 = num2  ;
    printf("Original value of num1: %d\n",
        num1);
    printf("Updated value after post
        -increment: %d\n", result1);
    printf("Original value of num2: %d\n",
        num2);
    printf("Updated value after post
        -decrement: %d\n", result2);
    return 0;
}
```

OUTPUT

```
my name is drishti juyal
Enter two integers: 12
34
Original value of num1: 13
Updated value after post-increment: 12
Original value of num2: 33
Updated value after post-decrement: 34
```

22-Wap to grade according to marks range

Between 100-85 Grade 10

Between 75-85 grade 9

Between 65-75 grade 8

Between 55-65 grade 7

Between 50-55 Grade 6

Between 40-50 grade 5

Rest fail

INPUT

```c
#include <stdio.h>

int main() {
    int marks;
    printf("my name drishti\n");
    printf("Enter the marks: ");
    scanf("%d", &marks);

    if (marks >= 85 && marks <= 100) {
        printf("Grade 10\n");
    } else if (marks >= 75 && marks <
        85) {
        printf("Grade 9\n");
    } else if (marks >= 65 && marks <
        75) {
        printf("Grade 8\n");
    } else if (marks >= 55 && marks <
        65) {
        printf("Grade 7\n");
    } else if (marks >= 50 && marks <
        55) {
        printf("Grade 6\n");
    } else if (marks >= 40 && marks <
        50) {
        printf("Grade 5\n");
    } else {
        printf("Fail\n");
    }
```

Run

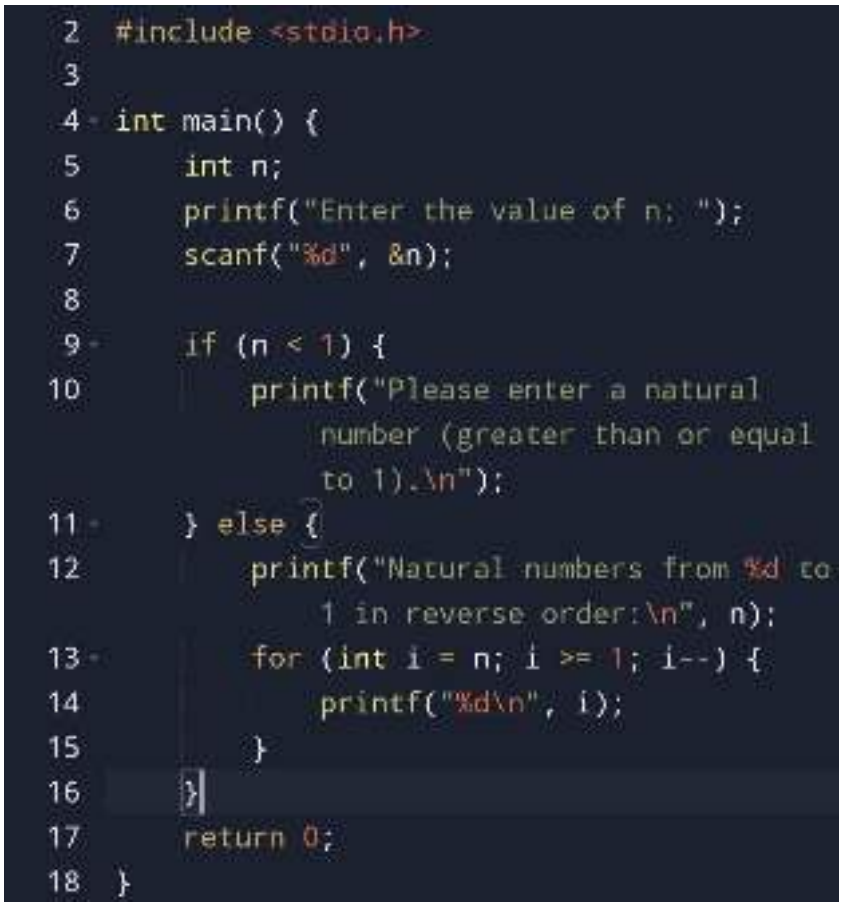
OUTPUT

```
/tmp/XskWlZCCze.o
my name drishti
Enter the marks: 75
Grade 9
```

23-

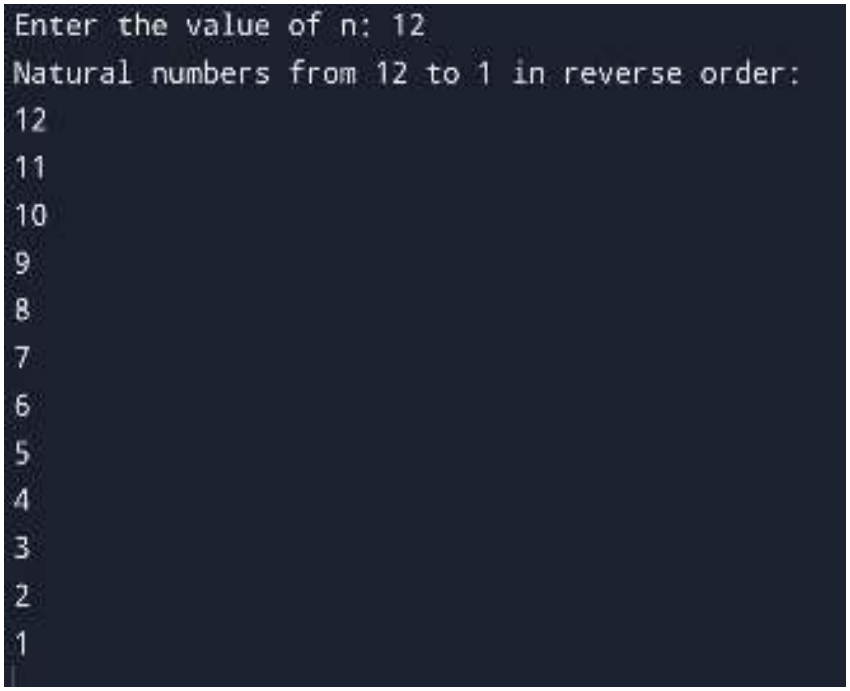
Write a c program to print all natural numbers in reverse (from n to 1)

INPUT



```c
#include <stdio.h>

int main() {
    int n;
    printf("Enter the value of n: ");
    scanf("%d", &n);

    if (n < 1) {
        printf("Please enter a natural
            number (greater than or equal
            to 1).\n");
    } else {
        printf("Natural numbers from %d to
            1 in reverse order:\n", n);
        for (int i = n; i >= 1; i--) {
            printf("%d\n", i);
        }
    }
    return 0;
}
```

OUTPUT


Enter the value of n: 12
Natural numbers from 12 to 1 in reverse order:
12
11
10
9
8
7
6
5
4
3
2
1

24-

Write a c program to print all natural numbers from 1 to n

INPUT

```c
#include <stdio.h>

int main() {
    int n;

    printf("Enter a positive integer (n): ");
    scanf("%d", &n);

    if (n < 1) {
        printf("Please enter a positive integer.\n");
    } else {
        printf("Natural numbers from 1 to %d:\n", n);

        for (int i = 1; i <= n; i++) {
            printf("%d ", i);
        }
        printf("\n");
    }

    return 0;
}
```

OUTPUT

```
Enter a positive integer (n): 12
Natural numbers from 1 to 12:
1 2 3 4 5 6 7 8 9 10 11 12
```

25

Write a c program to print all alphabets from a to z

INPUT

```c
#include <stdio.h>

int main() {
    char alphabet;

    for(alphabet = 'a'; alphabet <= 'z';
        alphabet++) {
        printf("%c ", alphabet);
    }

    printf("\n");

    return 0;
}
```

OUTPUT

```
/tmp/zwa0RdG5Si.o
a b c d e f g h i j k l m n o p q r s t u v w x
    y z
```

26

C Program to print all even numbers between 1 to 100

INPUT

```c
#include <stdio.h>

int main() {
    for (int i = 2; i <= 100; i += 2) {
        printf("%d ", i);
    }
    return 0;
}
```

OUTPUT

```
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34
36 38 40 42 44 46 48 50 52 54 56 58 60 62 64
66 68 70 72 74 76 78 80 82 84 86 88 90 92 94
96 98 100
```

27

Write a c program to print all odd numbers between 1 to 10

INPUT

```c
#include <stdio.h>

int main() {
    int i;

    printf("Odd numbers between 1 and 100
        :\n");

    for (i = 1; i <= 100; i++) {
        if (i % 2 != 0) {
            printf("%d\n", i);
        }
    }

    return 0;
}
```

OUTPUT

```
Odd numbers between 1 and 100:
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
```

28

Write a c program to find sum of all natural numbers between 1 to n

INPUT

```c
#include <stdio.h>

int main() {
    int n, sum = 0;
    printf("Enter a positive integer n: ");
    scanf("%d", &n);
    if (n <= 0) {
        printf("Please enter a positive integer.\n");
    } else {
        for (int i = 1; i <= n; i++) {
            sum += i;
        }
        printf("The sum of natural numbers from 1 to %d is %d.\n", n, sum);
    }

    return 0;
}
```

OUTPUT

```
Enter a positive integer n: 12
The sum of natural numbers from 1 to 12 is 78.
```

29

Write a c program to find sum of all even numbers between 1 to n

INPUT

```c
#include <stdio.h>

int main() {
    int n, sum = 0;

    printf("Enter a positive integer n: ");
    scanf("%d", &n);

    for (int i = 2; i <= n; i += 2) {
        sum += i;
    }

    printf("Sum of even numbers between 1 and %d is %d\n", n, sum);

    return 0;
}
```

OUTPUT

```
Enter a positive integer n: 10
Sum of even numbers between 1 and 10 is 30
```

30

Write a c program to find sum of all odd numbers between 1 N to

INPUT

```c
#include <stdio.h>

int main() {
    int n, sum = 0;

    printf("Enter a positive integer n: ");
    scanf("%d", &n);

    for (int i = 2; i <= n; i += 2) {
        sum += i;
    }

    printf("Sum of even numbers between 1 and %d is %d\n", n, sum);

    return 0;
}
```

OUTPUT

```
Enter a positive integer n: 10
Sum of even numbers between 1 and 10 is 30
```

31

Write a c program to find sum of all odd numbers between 1 to n

INPUT

```c
#include <stdio.h>

int main() {
    int n, sum = 0;

    printf("Enter a positive integer n: ");
    scanf("%d", &n);

    if (n < 1) {
        printf("Please enter a positive integer.\n");
    } else {
        for (int i = 1; i <= n; i++) {
            if (i % 2 != 0) {
                sum += i;
            }
        }
        printf("The sum of all odd numbers between 1 and %d is: %d\n", n, sum);
    }

    return 0;
}
```

OUTPUT

```
Enter a positive integer n: 24
The sum of all odd numbers between 1 and 24 is:
    144
```

32

Write a c program to print multiplication table of any number

INPUT

```c
#include <stdio.h>
int main() {
    int number, i;
    printf("Enter the number for which you
        want to print the multiplication
        table: ");
    scanf("%d", &number);
    printf("Multiplication table for %d
        :\n", number);
    for (i = 1; i <= 10; i++) {
        printf("%d x %d = %d\n", number, i
            , number * i);
    }

    return 0;
}
```

OUTPUT

```
Enter the number for which you want to print the
    multiplication table: 12
Multiplication table for 12:
12 x 1 = 12
12 x 2 = 24
12 x 3 = 36
12 x 4 = 48
12 x 5 = 60
12 x 6 = 72
12 x 7 = 84
12 x 8 = 96
12 x 9 = 108
12 x 10 = 120
```

33

Write a c program to count number of digits in a number

INPUT

```c
#include <stdio.h>

int main() {
    int number;
    int count = 0;

    printf("Enter an integer: ");
    scanf("%d", &number);

    while (number != 0) {
        number /= 10;
        count++;
    }

    printf("Number of digits: %d\n", count
        );

    return 0;
}
```

OUTPUT

```
Enter an integer: 12
Number of digits: 2
```

34

Write a c program to find first and last digit of a number

INPUT

```c
#include <stdio.h>

int main() {
    int number, firstDigit, lastDigit;
    printf("Enter a number: ");
    scanf("%d", &number);
    lastDigit = number % 10;
    while (number >= 10) {
        number /= 10;
    }
    firstDigit = number;
    printf("First digit: %d\n", firstDigit
        );
    printf("Last digit: %d\n", lastDigit);

    return 0;
}
```

OUTPUT

```
Enter a number: 12
First digit: 1
Last digit: 2
```

35

Write a c program to find sum of first and last digit of a number.

OUTPUT

```
The sum of the first and last digits is: 0
```

36

Write a c program to swap first and last digits of a number

```c
#include <stdio.h>

int main() {
    int number, originalNumber, firstDigit
        , lastDigit, swappedNumber = 0;
    printf("Enter a number: ");
    scanf("%d", &number);
    originalNumber = number;
    lastDigit = number % 10;
    while (number >= 10) {
        number /= 10;
    }
    firstDigit = number;
    swappedNumber = lastDigit;
    swappedNumber *= 10;
    swappedNumber += originalNumber %
        (number * 10);
    swappedNumber -= lastDigit;
    printf("Number with first and last
        digits swapped: %d\n",
        swappedNumber);

    return 0;
}
```

OUTPUT

```
Enter a number: 12
Number with first and last digits swapped: 20
```

37

Write a c program to calculate sum of digits of a number

INPUT

```c
#include <stdio.h>

int main() {
    int num, sum = 0, digit;
    printf("Enter a number: ");
    scanf("%d", &num);
    while (num > 0) {
        digit = num % 10;
        sum += digit;
        num /= 10;
    }
    printf("Sum of digits: %d\n", sum);

    return 0;
}
```

OUTPUT

```
Enter a number: 12
Sum of digits: 3
```

38

Write a c program to calculate product of digits of a number

INPUT

```c
#include <stdio.h>

int main() {
    int number, digit, product = 1;

    printf("Enter an integer: ");
    scanf("%d", &number);
    while (number > 0) {
        digit = number % 10;
        product *= digit;
        number /= 10;
    }
    printf("The product of the digits is:
        %d\n", product);
    return 0;
}
```

OUTPUT

```
Enter an integer: 12
The product of the digits is: 2
```

39

Write a c program to enter a number and print its reverse

INPUT

```c
#include <stdio.h>

int main() {
    int number, reversedNumber = 0;

    printf("Enter a number: ");
    scanf("%d", &number);

    while (number != 0) {
        reversedNumber = reversedNumber *
            10 + number % 10;
        number /= 10;
    }

    printf("Reverse of the number: %d\n",
        reversedNumber);

    return 0;
}
```

OUTPUT

```
Enter a number: 13
Reverse of the number: 31
```

40

Write a c program to check whether a number is palindrome or not

INPUT

```c
#include <stdio.h>
int main() {
    int n, reversed = 0, remainder, original
        ;
    printf("Enter an integer: ");
    scanf("%d", &n);
    original = n;
    while (n != 0) {
        remainder = n % 10;
        reversed = reversed * 10 +
            remainder;
        n /= 10;
    }
    if (original == reversed)
        printf("%d is a palindrome.",
            original);
    else
        printf("%d is not a palindrome.",
            original);

    return 0;
}
```

OUTPUT

```
Enter an integer: 2
2 is a palindrome.
```

41

Write a c program to find frequency of each digit on a given integer

INPUT

```c
#include <stdio.h>

int main() {
    int num;
    printf("Enter an integer: ");
    scanf("%d", &num);
    int digitCount[10] = {0};
    while (num > 0) {
        int digit = num % 10;
        digitCount[digit]++;
        num /=10;
    }
    printf("Digit frequencies:\n");
    for (int i = 0; i < 10; i++) {
        if (digitCount[i] > 0) {
            printf("Digit %d: %d times\n",
                i, digitCount[i]);
        }
    }

    return 0;
}
```

OUTPUT

```
Enter an integer: 2
Digit frequencies:
Digit 2: 1 times
```

42

Write a c program to enter a number and print it in words

INPUT

```c
// Online C compiler to run C program online
#include <stdio.h>
void printNumberInWords(int number);
int main() {
    int number;
    printf("Enter a number: ");
    scanf("%d", &number);
    printNumberInWords(number);
    return 0;
}
void printNumberInWords(int number) {
    char *ones[] = {"", "One", "Two", "Three", "Four", "Five", "Six", "Seven",
        "Eight", "Nine", "Ten", "Eleven", "Twelve", "Thirteen", "Fourteen",
        "Fifteen", "Sixteen", "Seventeen", "Eighteen", "Nineteen"};
    char *tens[] = {"", "", "Twenty", "Thirty", "Forty", "Fifty", "Sixty",
        "Seventy", "Eighty", "Ninety"};
    if (number >= 1 && number <= 19) {
        printf("%s\n", ones[number]);
    } else if (number >= 20 && number <= 99) {
        printf("%s%s\n", tens[number / 10], ones[number % 10]);
    } else {
        printf("Number out of range for this simple program.\n");
    }
}
```

OUTPUT

```
/tmp/aZAz95fTbN.o
Enter a number: 78
SeventyEight
```

43

values their Write a c program to print all ASCII character with

INPUT

```c
#include <stdio.h>
int main() {
    printf("ASCII Characters and Their
        Values:\n");
    for (int i = 0; i < 128; i++) {
        if (i % 16 == 0) {
            printf("\n");
        }
        printf("%3d: %c  ", i, (char)i);
    }
    printf("\n");
    return 0;
}
```

OUTPUT

44

Write a c program to find power of a number using for loop

INPUT

```c
#include <stdio.h>
int main() {
    double base, exponent, result = 1;
    printf("Enter the base: ");
    scanf("%lf", &base);
    printf("Enter the exponent: ");
    scanf("%lf", &exponent);
    for (int i = 1; i <= exponent; i++) {
        result *= base;
    }
    printf("%.2lf^%.2lf = %.2lf\n", base,
        exponent, result);
    return 0;
}
```

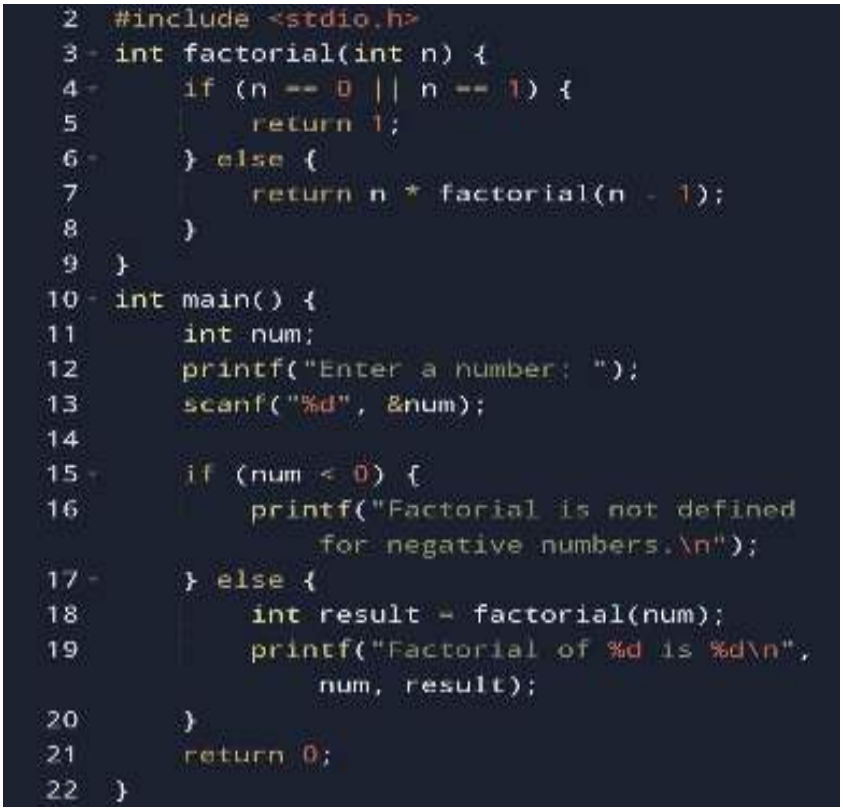
OUTPUT

```
Enter the base: 24
Enter the exponent: 2
24.00^2.00 = 576.00
```

45

Write a c program to calculate factorial of a number

INPUT



```c
#include <stdio.h>
int factorial(int n) {
    if (n == 0 || n == 1) {
        return 1;
    } else {
        return n * factorial(n - 1);
    }
}
int main() {
    int num;
    printf("Enter a number: ");
    scanf("%d", &num);

    if (num < 0) {
        printf("Factorial is not defined
            for negative numbers.\n");
    } else {
        int result = factorial(num);
        printf("Factorial of %d is %d\n",
            num, result);
    }
    return 0;
}
```

OUTPUT

```
Enter a number: 12
Factorial of 12 is 479001600
```

46

GCD) of two numbers) Write a c program to find HCF

INPUT

```c
#include <stdio.h>
int findGCD(int a, int b) {
    if (b == 0)
        return a;
    return findGCD(b, a % b);
}
int main() {
    int num1, num2;
    printf("Enter two numbers: ");
    scanf("%d %d", &num1, &num2);
    int gcd = findGCD(num1, num2);
    printf("The GCD of %d and %d is %d\n",
        num1, num2, gcd);
    return 0;
}
```

OUTPUT

```
Enter two numbers: 12 , 23


The GCD of 12 and 3 is 3
```

Write a c program to find LCM of two number

```c
#include <stdio.h>
int gcd(int a, int b) {
    if (b == 0)
        return a;
    return gcd(b, a % b);
}
int lcm(int a, int b) {
    return (a * b) / gcd(a, b);
}
int main() {
    int num1, num2;
    printf("Enter two numbers: ");
    scanf("%d %d", &num1, &num2);
    int result = lcm(num1, num2);
    printf("LCM of %d and %d is %d\n",
        num1, num2, result);
    return 0;
}
```

OUTPUT

```
Enter two numbers: 12 , 23
LCM of 12 and 32765 is 393180
```

48

Write a c program to check whether a number is prime number or not

INPUT

```c
#include <stdio.h>
int isPrime(int n) {
    if (n <= 1) {
        return 0;
    }
    for (int i = 2; i * i <= n; i++) {
        if (n % i == 0) {
            return 0;
        }
    }
    return 1;
}
int main() {
    int num;
    printf("Enter a number: ");
    scanf("%d", &num);
    if (isPrime(num)) {
        printf("%d is a prime number.\n");
    } else {
        printf("%d is not a prime number
            .\n");
    }
    return 0;
}
```

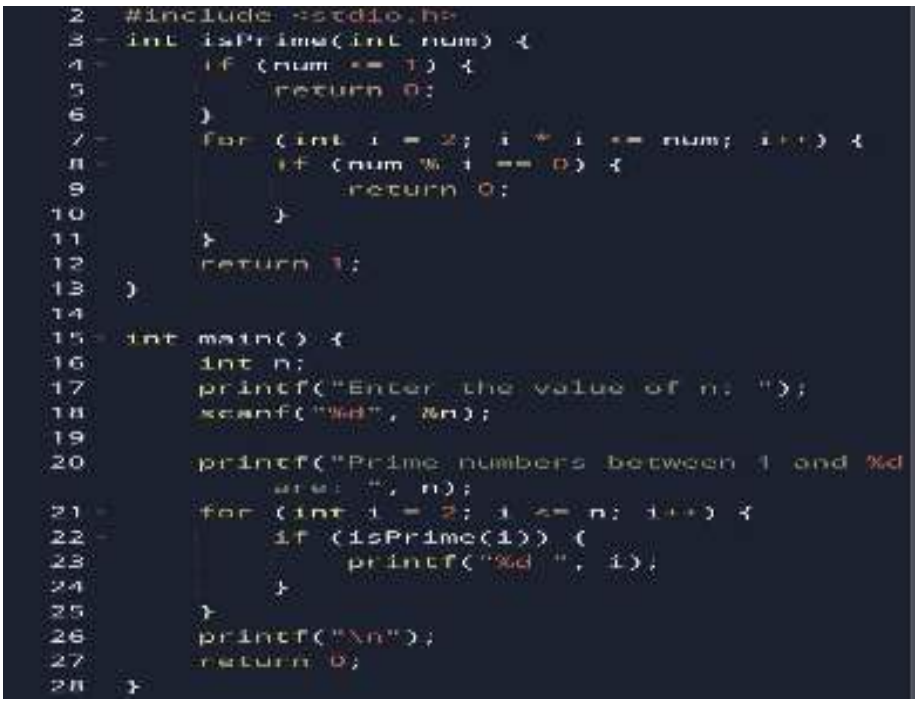
OUTPUT

```
Enter a number: 12
0 is not a prime number.
```

49

Write a c program to print all prime numbers between 1 to n

INPUT



```c
#include <stdio.h>
int isPrime(int num) {
    if (num <= 1) {
        return 0;
    }
    for (int i = 2; i * i <= num; i++) {
        if (num % i == 0) {
            return 0;
        }
    }
    return 1;
}

int main() {
    int n;
    printf("Enter the value of n: ");
    scanf("%d", &n);

    printf("Prime numbers between 1 and %d
        are: ", n);
    for (int i = 2; i <= n; i++) {
        if (isPrime(i)) {
            printf("%d ", i);
        }
    }
    printf("\n");
    return 0;
}
```

OUTPUT

```
Enter the value of n: 12
Prime numbers between 1 and 12 are: 2 3 5 7 11
```

50

Write a c program to find sum of all prime numbers between 1 to n

INPUT

```c
#include <stdio.h>
int isPrime(int num) {
    if (num == 1) {
        return 0;
    }
    for (int i = 2; i * i <= num; i++) {
        if (num % i == 0) {
            return 0;
        }
    }
    return 1;
}

int main() {
    int n;
    printf("Enter a positive integer 'n': ");
    scanf("%d", &n);

    int sum = 0;
    for (int i = 2; i <= n; i++) {
        if (isPrime(i)) {
            sum += i;
        }
    }
    printf("The sum of prime numbers between 1 and %d is %d\n", n, sum);
    return 0;
}
```

Run

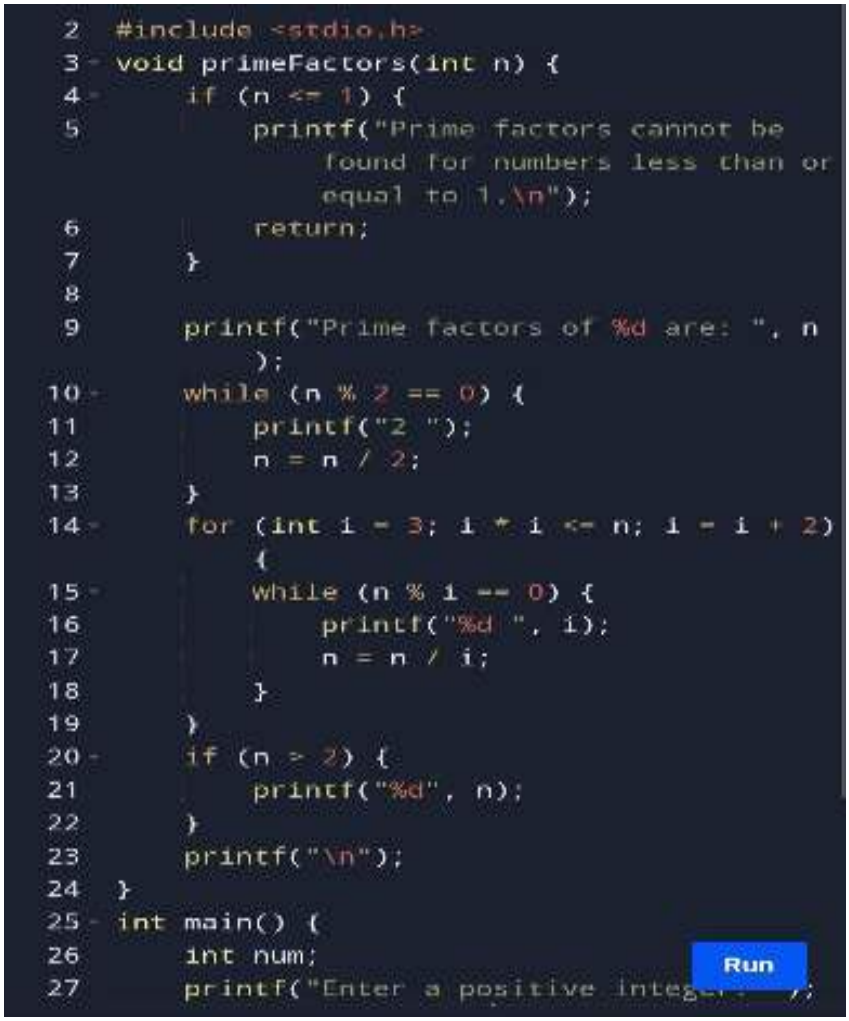
OUTPUT

```
Enter a positive integer 'n': 12
The sum of prime numbers between 1 and 12 is 28
```

51

Write a c program to find all prime factors of a number

INPUT



OUTPUT

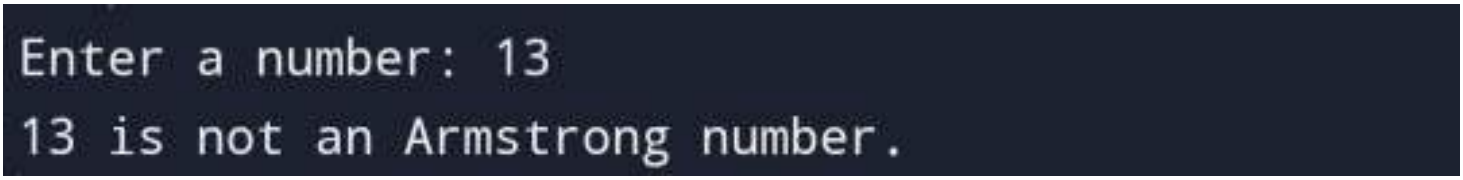
```
Enter a positive integer: 12
Prime factors of 12 are: 2 2 3
```

52

Write a c program to check whether a number is armstrong number or not

INPUT

OUTPUT



53

Write a c program to print all

number between 1 to n Armstrong

INPUT


#include <stdio.h>
#include <math.h>
int isArmstrong(int num) {
int originalNum, remainder, result = 0
, n = 0;
originalNum = num;
while (originalNum != 0) {
originalNum /= 10;
++n;
}
originalNum = num;
while (originalNum != 0) {
remainder = originalNum % 10;
result += pow(remainder, n);
originalNum /= 10;
}
return (result == num);
}
int main() {
int n;
printf("Enter a positive integer n: "
);
scanf("%d", &n);
if (n < 1) {
printf("Please enter a positive
integer greater than or equal
to 1.\n");
return 1;
}
printf("Armstrong numbers
Run

OUTPUT

```
Enter a positive integer n: 12
Armstrong numbers between 1 and 12 are:
1
2
3
4
5
6
7
8
9
```

54

Write a c program to check whether a number is perfect number or not

INPUT

```c
#include <stdio.h>
int main() {
    int number, sum = 0;
    printf("Enter a number: ");
    scanf("%d", &number);
    for (int i = 1; i <= number / 2; i++)
        {
        if (number % i == 0) {
            sum += i;
        }
    }
    if (sum == number) {
        printf("%d is a perfect number.\n"
            , number);
    } else {
        printf("%d is not a perfect number
            .\n", number);
    }
    return 0;
}
```

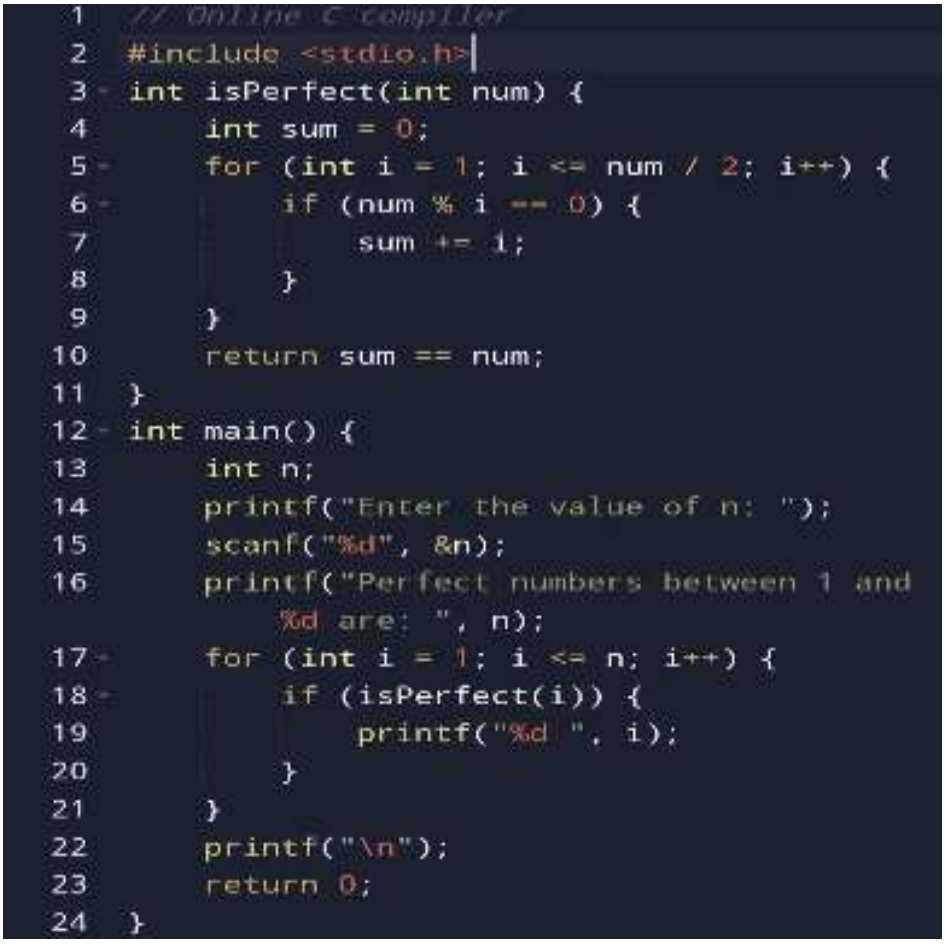
OUTPUT

```
Enter a number: 24
24 is not a perfect number.
```

55

Write a c program to print all perfect numbers between 1 to n

INPUT



```c
// Online C compiler
#include <stdio.h>
int isPerfect(int num) {
    int sum = 0;
    for (int i = 1; i <= num / 2; i++) {
        if (num % i == 0) {
            sum += i;
        }
    }
    return sum == num;
}
int main() {
    int n;
    printf("Enter the value of n: ");
    scanf("%d", &n);
    printf("Perfect numbers between 1 and
        %d are: ", n);
    for (int i = 1; i <= n; i++) {
        if (isPerfect(i)) {
            printf("%d ", i);
        }
    }
    printf("\n");
    return 0;
}
```

OUTPUT

```
Enter the value of n: 10
Perfect numbers between 1 and 10 are: 6
```

56

Write a c program to check whether a number is strong number or not

INPUT

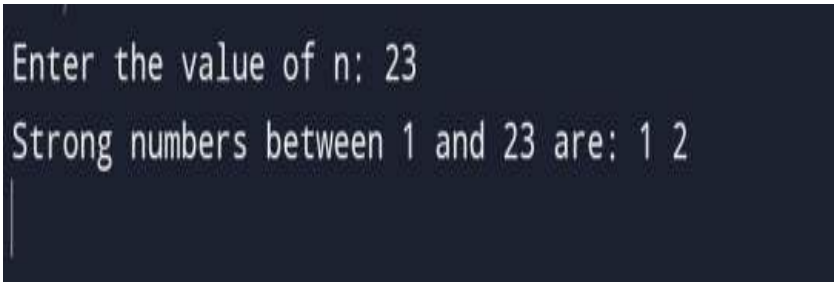
OUTPUT

57

Write a c program to print all strong numbers between 1 to n

INPUT

OUTPUT



58

Write a c program to print Fibonacci series up to n terms

INPUT

```
#include <stdio.h>
int main() {
    int n, i;
    long long int first = 0, second = 1,
        next;
    printf("Enter the number of terms: ");
    scanf("%d", &n);

    printf("Fibonacci Series up to %d
        terms:\n", n);

    for (i = 1; i <= n; ++i) {
        if (i == 1) {
            printf("%lld, ", first);
            continue;
        }
        if (i == 2) {
            printf("%lld, ", second);
            continue;
        }
        next = first + second;
        first = second;
        second = next;
        printf("%lld, ", next);
    }
    printf("\n");
    return 0;
}
```

OUTPUT

```
Enter the number of terms: 23
Fibonacci Series up to 23 terms:
0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144,
    233, 377, 610, 987, 1597, 2584, 4181, 6765,
    10946, 17711,
```

59

a c program to find one's complement of a binary number Write

INPUT

```c
#include <stdio.h>
#include <string.h>
int main() {
    char binaryNumber[100],
        onesComplement[100];
    printf("Enter a binary number: ");
    scanf("%s", binaryNumber);
    int length = strlen(binaryNumber);
    for (int i = 0; i < length; i++) {
        if (binaryNumber[i] == '0') {
            onesComplement[i] = '1';
        } else if (binaryNumber[i] == '1')
            {
            onesComplement[i] = '0';
        } else {
            printf("Invalid binary number.
                Please enter a binary
                number (0s and 1s only
                ).\n");
            return 1;
        }
    }
    onesComplement[length] = '\0';
    printf("One's complement: %s\n",
        onesComplement);
    return 0;
}
```

OUTPUT

```
Enter a binary number: 1001
One's complement: 0110
```

60

Write a c program to find two's complement of a binary number

INPUT

```c
#include <stdio.h>
int main() {
    char binary[32];
    int n, i;
    printf("Enter a binary number: ");
    scanf("%s", binary);
    for (n = 0; binary[n] != '\0'; n++) {
    }
    for (i = 0; i < n; i++) {
        if (binary[i] == '0') {
            binary[i] = '1';
        } else if (binary[i] == '1') {
            binary[i] = '0';
        }
    }
    for (i = n - 1; i >= 0; i--) {
        if (binary[i] == '1') {
            binary[i] = '0';
        } else {
            binary[i] = '1';
            break;
        }
    }
    printf("Two's complement: %s\n",
        binary);
    return 0;
}
```

OUTPUT

```
Enter a binary number: 1011
Two's complement: 0101
```

61

Write a c program to convert binary to octal number system

INPUT

```c
#include <stdio.h>
#include <math.h>
int binaryToOctal(int binary) {
    int octal = 0, decimal = 0, i = 0;
    while (binary != 0) {
        int remainder = binary % 10;
        decimal += remainder * pow(2, i);
        binary /= 10;
        i++;
    }
    i = 1;
    while (decimal != 0) {
        int remainder = decimal % 8;
        octal += remainder * i;
        decimal /= 8;
        i *= 10;
    }
    return octal;
}
int main() {
    int binary;
    printf("Enter a binary number: ");
    scanf("%d", &binary);
    int octal = binaryToOctal(binary);
    printf("Octal equivalent: %d\n", octal
        );
    return 0;
}
```

OUTPUT

```
Enter a binary number: 1001
Octal equivalent: 11
```

62

Write a c program to convert binary to decimal number system

INPUT

```c
#include <stdio.h>
#include <stdio.h>
int binaryToDecimal(long long binary) {
    int decimal = 0, base = 1, remainder;
    while (binary > 0) {
        remainder = binary % 10;
        decimal += remainder * base;
        base *= 2;
        binary /= 10;
    }
    return decimal;
}
int main() {
    long long binary;
    printf("Enter a binary number: ");
    scanf("%lld", &binary);

    int decimal = binaryToDecimal(binary);
    printf("Decimal equivalent: %d\n",
        decimal);
    return 0;
}
```

OUTPUT

```
Enter a binary number: 1011
Decimal equivalent: 11
```

PATTERN EXERCISE

1

Pyramid star pattern

INPUT

```c
#include <stdio.h>
int main() {
    int rows, i, j, space;
    printf("Enter the number of rows: ");
    scanf("%d", &rows);
    for (i = 1; i <= rows; i++) {
        for (space = 1; space <= rows - i;
            space++) {
            printf(" ");
        }
        for (j = 1; j <= 2 * i - 1; j++) {
            printf("*");
        }
        printf("\n");
    }
    return 0;
}
```

OUTPUT

```
Enter the number of rows: 12
*
          ***
         *****
        *******
       *********
      ***********
     *************
    ***************
   *****************
  *******************
 *********************
***********************
```

2

hollow pyramid star pattern

INPUT

```c
#include <stdio.h>
int main() {
    int rows, i, j, space;
    printf("Enter the number of rows: ");
    scanf("%d", &rows);
    for (i = 1; i <= rows; i++) {
        for (space = 1; space <= rows - i;
            space++) {
            printf(" ");
        }
        for (j = 1; j <= 2 * i - 1; j++) {
            if (j == 1 || j == 2 * i - 1
                || i == rows) {
                printf("*");
            } else {
                printf(" ");
            }
        }
        printf("\n");
    }
    return 0;
}
```

OUTPUT

```
Enter the number of rows: 10
*
  * *
 *   *
*     *
 *   *
  * *
   *
  * *
 *   *
*     *
*********
```

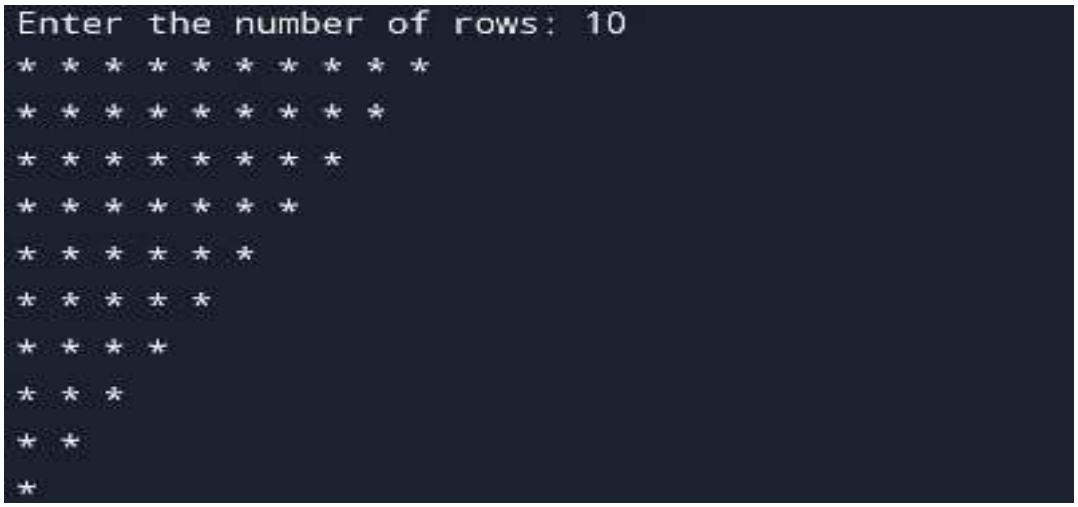
3

Inverted pyramid star pattern

INPUT

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

OUTPUT



4

Hollow pyramid inverted star pattern

INPUT

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

    for(i=1; i<=rows; i++)
    {
        for(j=1; j<i; j++)
        {
            printf(" ");
        }
        for(j = i; j<=(rows*2 - (2*i )); j
            ++)
        {
            if(i==1 || j==1 || j==(rows*2
                - (2*i - 1)))
            {
                printf("*");
            }
            else
            {
                printf(" ");
            }
        }

        printf("\n");
    }
    return 0;
}
```

Run

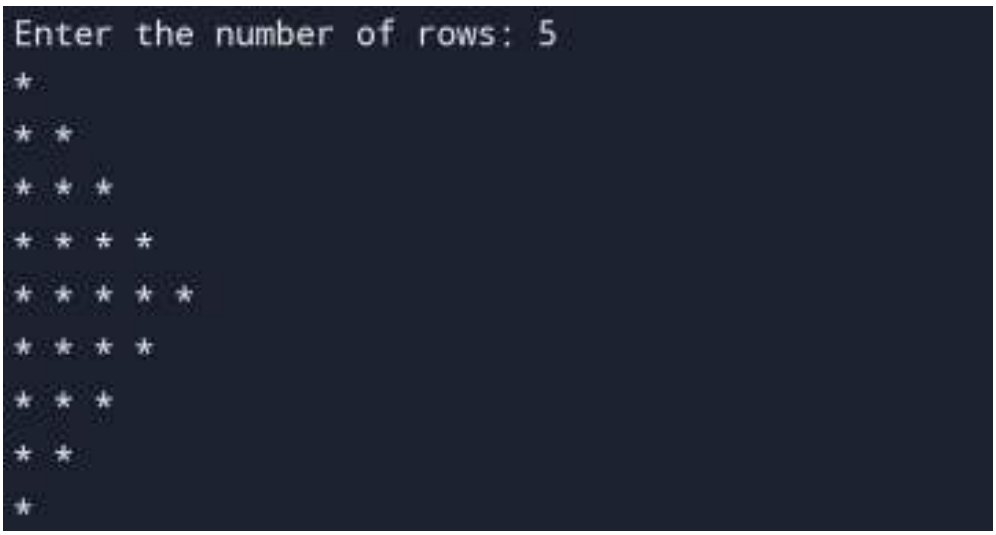
```
Enter number of rows: 10
**********
 *        *
  *      *
   *    *
    *  *
     **
      *
```

Half diamond star pattern

INPUT

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

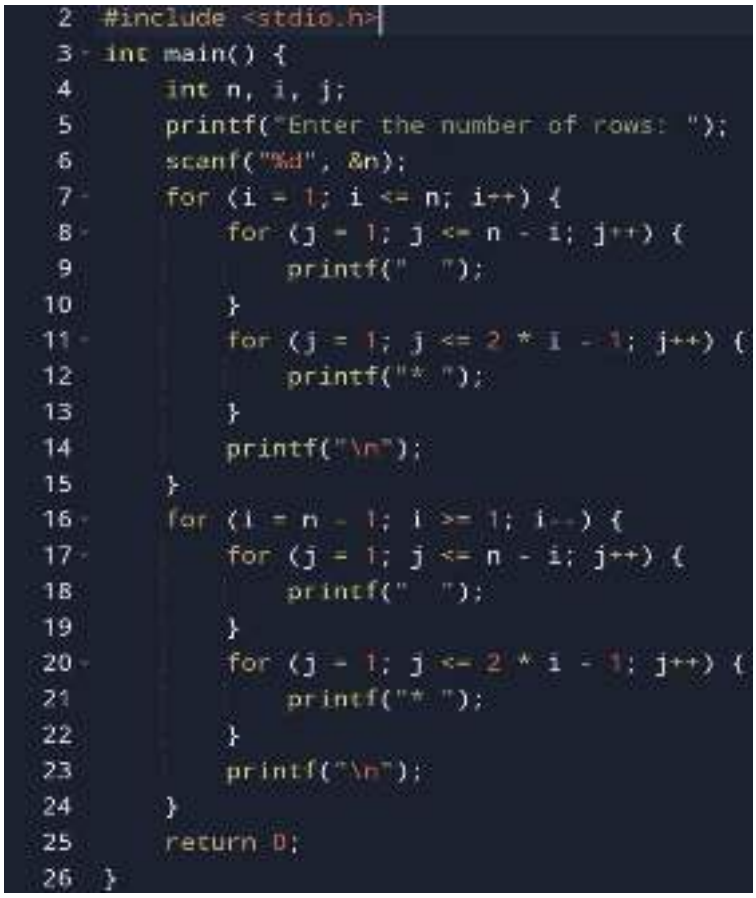
OUTPUT



6

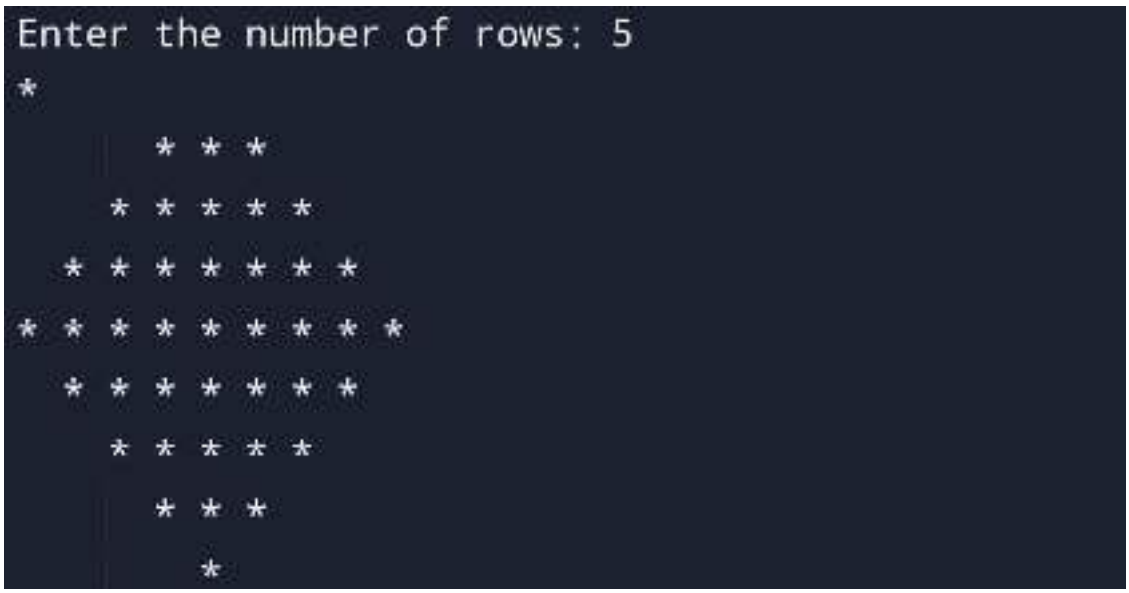
Mirror half diamond star pattern

INPUT



```c
#include <stdio.h>
int main() {
    int n, i, j;
    printf("Enter the number of rows: ");
    scanf("%d", &n);
    for (i = 1; i <= n; i++) {
        for (j = 1; j <= n - i; j++) {
            printf("  ");
        }
        for (j = 1; j <= 2 * i - 1; j++) {
            printf("* ");
        }
        printf("\n");
    }
    for (i = n - 1; i >= 1; i--) {
        for (j = 1; j <= n - i; j++) {
            printf("  ");
        }
        for (j = 1; j <= 2 * i - 1; j++) {
            printf("* ");
        }
        printf("\n");
    }
    return 0;
}
```

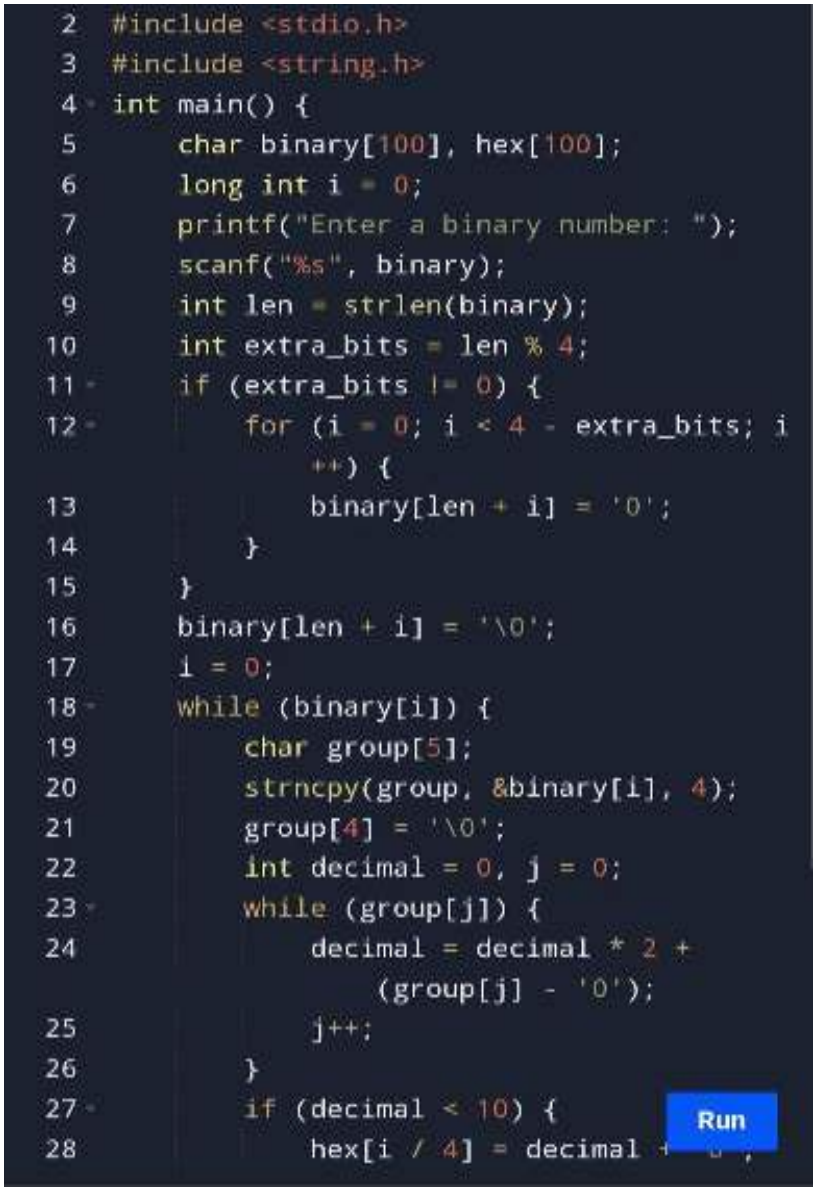
OUTPUT



63

Write a c program to convert binary to hexadecimal number system

INPUT



OUTPUT

64

Write a c program to convert octal to binary number system

INPUT

```c
#include <stdio.h>
void octalToBinary(int octalNumber) {
    long long binaryNumber = 0;
    int base = 1;
    while (octalNumber > 0) {
        int remainder = octalNumber % 10;
        octalNumber /= 10;
        int binaryDigit = 0;
        int temp = 1;
        while (remainder > 0) {
            binaryDigit += (remainder % 2)
                * temp;
            remainder /= 2;
            temp *= 10;
        }
        binaryNumber += binaryDigit * base
            ;
        base *= 1000;
    }
    printf("Binary equivalent: %lld\n",
        binaryNumber);
}
int main() {
    int octalNumber;
    printf("Enter an octal number: ");
    scanf("%d", &octalNumber);
    octalToBinary(octalNumber);
    return 0;
}
```

Run

OUTPUT

```
Enter an octal number: 23
Binary equivalent: 10011
```

65

Write a c program to convert octal to binary number system.

INPUT

```c
#include <stdio.h>
#include <math.h>
int main() {
    int octalNum, decimalNum = 0, i = 0;
    printf("Enter an octal number: ");
    scanf("%d", &octalNum);
    while (octalNum != 0) {
        int remainder = octalNum % 10;
        decimalNum += remainder * pow(8, i
            );
        octalNum /= 10;
        i++;
    }
    printf("Decimal equivalent: %d\n",
        decimalNum);
    return 0;
}
```

OUTPUT

```
Enter an octal number: 80
Decimal equivalent: 64
```

66

Write a c program to convert octal to hexadecimal number system

INPUT

OUTPUT

```
Enter an octal number: 23
Hexadecimal equivalent: 11
```

67

Write a c program to convert decimal into binary number

INPUT

```c
#include <stdio.h>
void decimalToBinary(int decimalNumber) {
    int binaryNumber[32];
    int i = 0;
    if (decimalNumber == 0) {
        printf("Binary equivalent: 0\n");
        return;
    }
    while (decimalNumber > 0) {
        binaryNumber[i] = decimalNumber %
            2;
        decimalNumber /= 2;
        i++;
    }
    printf("Binary equivalent: ");
    for (int j = i - 1; j >= 0; j--) {
        printf("%d", binaryNumber[j]);
    }
    printf("\n");
}
int main() {
    int decimalNumber;
    printf("Enter a decimal number: ");
    scanf("%d", &decimalNumber);
    decimalToBinary(decimalNumber);
    return 0;
}
```

OUTPUT

```
Enter a decimal number: 8
Binary equivalent: 1000
```

68

Write a c program to convert decimal to octal number system

INPUT

```c
#include <stdio.h>
int main() {
    int decimalNumber, octalNumber = 0, i
        = 1;
    printf("Enter a decimal number: ");
    scanf("%d", &decimalNumber);
    while (decimalNumber != 0) {
        octalNumber += (decimalNumber % 8)
            * i;
        decimalNumber /= 8;
        i *= 10;
    }
    printf("The octal equivalent is: %d\n"
        , octalNumber);
    return 0;
}
```

OUTPUT

```
Enter a decimal number: 12.4
The octal equivalent is: 14
```

69

Write a c program to convert
decimal to hexadecimal number system

INPUT

```c
#include <stdio.h>
int main() {
    int decimalNumber, remainder, i = 0;
    char hexadecimalNumber[50];
    printf("Enter a decimal number: ");
    scanf("%d", &decimalNumber);
    while (decimalNumber != 0) {
        remainder = decimalNumber % 16;
        if (remainder < 10)
            hexadecimalNumber[i] =
                remainder + '0';
        else
            hexadecimalNumber[i] =
                remainder + 'A' - 10;
        decimalNumber /= 16;
        i++;
    }
    printf("The hexadecimal equivalent is:
        0x");
    for (i = i - 1; i >= 0; i--) {
        printf("%c", hexadecimalNumber[i]
            );
    }
    printf("\n");
    return 0;
}
```

OUTPUT

```
Enter a decimal number: 13
The hexadecimal equivalent is: 0xD
```

70

Write a c program to convert hexadecimal to binary number system

INPUT

Otput

```
Enter a hexadecimal number: D
The binary equivalent is: 1101
```

71

Write a c program to convert hexadecimal to octal number system

INPUT

OUPUT

```
Enter a hexadecimal number: A
Octal equivalent: 12
```

Write a c program to convert hexadecimal to decimal number system

INPUT

Output

```
Enter a hexadecimal number: F
Decimal equivalent: 15
```

2

NUMBER PATTERN PROGRAM

1

SQUARE NUMBER PATTERNS

INPUT

```c
#include <stdio.h>
int main() {
    int n;
    printf("Enter the size of the square:
        ");
    scanf("%d", &n);
    for (int i = 1; i <= n; i++) {
        for (int j = 1; j <= n; j++) {
            printf("%d ", i * j);
        }
        printf("\n");
    }
    return 0;
}
```

OUTPUT

```
Enter the size of the square: 5
1 2 3 4 5
2 4 6 8 10
3 6 9 12 15
4 8 12 16 20
5 10 15 20 25
```

2

NUMBER PATTERN 1

INPUT

OUTPUT

```c
#include <stdio.h>
int main() {
    int n;
    printf("Enter the number of rows: ");
    scanf("%d", &n);
    for (int i = 1; i <= n; i++) {
        for (int j = 1; j <= n; j++) {
            if ((i % 2 == 1 && j % 2 == 1)
                || (i % 2 == 0 && j % 2 == 0)) {
                printf("1");
            } else {
                printf("0");
            }
        }
        printf("\n");
    }
    return 0;
}
```

```
Enter the number of rows: 5
10101
01010
10101
01010
10101
```

3

NUMBER PATTERN 3

INPUT

```c
#include <stdio.h>
int main() {
    int n;
    printf("Enter the number of rows: ");
    scanf("%d", &n);
    for (int i = 1; i <= n; i++) {
        for (int j = 1; j <= n; j++) {
            if ((i + j) % 2 == 0) {
                printf("1");
            } else {
                printf("0");
            }
        }
        printf("\n");
    }
    return 0;
}
```

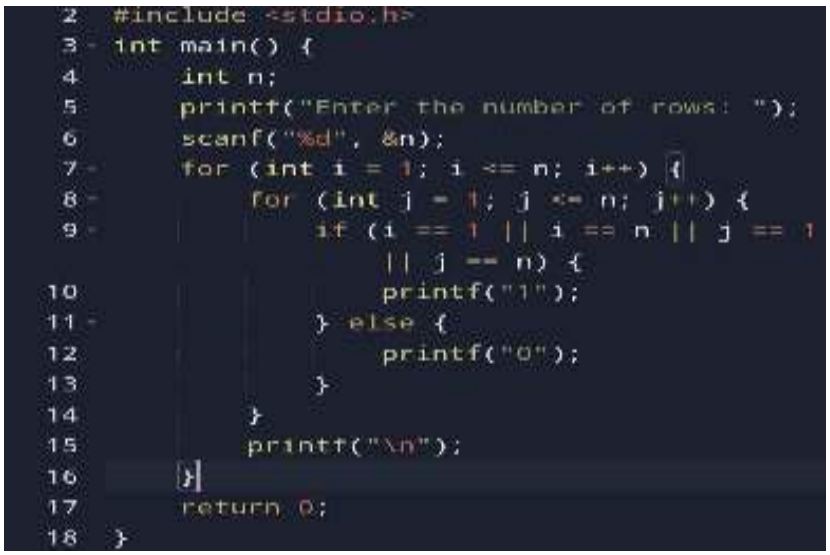
OUTPUT

```
Enter the number of rows: 5
10101
01010
10101
01010
10101
```

4

NUMBER PATTERN 4

INPUT



```c
#include <stdio.h>
int main() {
    int n;
    printf("Enter the number of rows: ");
    scanf("%d", &n);
    for (int i = 1; i <= n; i++) {
        for (int j = 1; j <= n; j++) {
            if (i == 1 || i == n || j == 1
                || j == n) {
                printf("1");
            } else {
                printf("0");
            }
        }
        printf("\n");
    }
    return 0;
}
```

OUTPUT

```
Enter the number of rows: 5
10101
01010
10101
01010
10101
```

5

NUMBER PATTERN 5

INPUT

```c
#include <stdio.h>
int main() {
    int n;
    printf("Enter the number of rows: ");
    scanf("%d", &n);
    for (int i = 1; i <= n; i++) {
        for (int j = 1; j <= n; j++) {
            if (i == n / 2 + 1 || j == n / 2 + 1) {
                printf("0");
            } else {
                printf("1");
            }
        }
        printf("\n");
    }
    return 0;
}
```

OUTPUT

```
Enter the number of rows: 5
10101
01010
10101
01010
10101
```

IF ELSE EXERCISE

1

Write a c program to find maximum between two numbers

INPUT

```c
#include <stdio.h>
int main() {
    int num1, num2;
    printf("Enter the first number: ");
    scanf("%d", &num1);
    printf("Enter the second number: ");
    scanf("%d", &num2);
    if (num1 > num2) {
        printf("Maximum is: %d\n", num1);
    } else {
        printf("Maximum is: %d\n", num2);
    }
    return 0;
}
```

OUTPUT

```
Enter the first number: 12
Enter the second number: 23
Maximum is: 23
```

2

Write a c program to find maximum between three numbers

INPUT

```c
#include <stdio.h>
int main() {
    int num1, num2, num3;
    printf("Enter the first number: ");
    scanf("%d", &num1);
    printf("Enter the second number: ");
    scanf("%d", &num2);
    printf("Enter the third number: ");
    scanf("%d", &num3);
    if (num1 >= num2) {
        if (num1 >= num3) {
            printf("Maximum is: %d\n",
                num1);
        } else {
            printf("Maximum is: %d\n",
                num3);
        }
    } else {
        if (num2 >= num1) {
            printf("Maximum is: %d\n",
                num2);
        } else {
            printf("Maximum is: %d\n",
                num1);
        }
    }
    return 0;
}
```

Run

OUTPUT

```
Enter the first number: 10
Enter the second number: 15
Enter the third number: 18
Maximum is: 18
```

3

, Write a c program to check whether a number is negative positive or zero

INPUT

OUTPUT

```
Enter a number: 12
The number is positive.
```

```
        printf("The number is positive.\n"
            );
    } else if (number < 0) {
        printf("The number is negative.\n"
            );
    } else {
        printf("The number is zero.\n");
    }
    return 0;
}
```

4

Write a c program to check whether a number is divisible by 5 and 11 or not

INPUT

```
#include <stdio.h>
int main() {
    int number;
    printf("Enter a number: ");
    scanf("%d", &number);
    if (number % 5 == 0 && number % 11 ==
        0) {
        printf("The number is divisible by
            both 5 and 11.\n");
    } else {
        printf("The number is not
            divisible by both 5 and 11.\n"
            );
    }
    return 0;
}
```

OUPUT

```
Enter a number: 110
The number is divisible by both 5 and 11.
```

83

Write a c program to check whether a number is even or odd

INPUT

```c
#include <stdio.h>
int main() {
    int number;
    printf("Enter a number: ");
    scanf("%d", &number);
    if (number % 2 == 0) {
        printf("The number is even.\n");
    } else {
        printf("The number is odd.\n");
    }
    return 0;
}
```

OUTPUT

```
Enter a number: 13
The number is odd.
```

Write a c program to check a year is leap year or not

INPUT

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

OUTPUT

```
Enter a year: 2024
2024 is a leap year.
```

7

Write a c program to check whether a character is alphabet or not

INPUT

```c
#include <stdio.h>
#include <ctype.h>
int main() {
    char character;
    printf("Enter a character: ");
    scanf(" %c", &character);
    if (isalpha(character)) {
        printf("%c is an alphabet
            character.\n", character);
    } else {
        printf("%c is not an alphabet
            character.\n", character);
    }
    return 0;
}
```

OUTPUT

```
Enter a character: A
A is an alphabet character.
```

8

Write a c program to input any alphabet and check whether it is vowel or consonant

INPUT

```c
#include <stdio.h>
#include <ctype.h>
int main() {
    char character;
    printf("Enter a character: ");
    scanf(" %c", &character);
    if (isalpha(character)) {
        character = tolower(character);
        if (character == 'a' || character == 'e' || character == 'i' || character == 'o' || character == 'u') {
            printf("%c is a vowel.\n", character);
        } else {
            printf("%c is a consonant.\n", character);
        }
    } else {
        printf("%c is not an alphabet character.\n", character);
    }
    return 0;
}
```

OUTPUT

```
Enter a character: e
e is a vowel.
```

9

Write a c program to input any character and check whether it digit or special character , is alphabet

INPUT

```c
#include <stdio.h>
#include <ctype.h>
int main() {
    char character;
    printf("Enter a character: ");
    scanf(" %c", &character);
    if (isalpha(character)) {
        if (isupper(character)) {
            printf("%c is an uppercase alphabet.\n", character);
        } else if (islower(character)) {
            printf("%c is a lowercase alphabet.\n", character);
        }
    }
    else if (isdigit(character)) {
        printf("%c is a digit.\n", character);
    }
    else {
        printf("%c is a special character.\n", character);
    }
    return 0;
}
```

OUTPUT

```
Enter a character: B
B is an uppercase alphabet.
```

10

Write a c program to check a whether a character is uppercase or lowercase

INPUT

```c
#include <stdio.h>
#include <ctype.h>
int main() {
    char character;
    printf("Enter a character: ");
    scanf(" %c", &character);
    if (isalpha(character)) {
        if (isupper(character)) {
            printf("%c is an uppercase
                character.\n", character);
        } else if (islower(character)) {
            printf("%c is a lowercase
                character.\n", character);
        }
    } else {printf("%c is not an alphabet
        character.\n", character);
    }
    return 0;
}
```

OUTPUT

```
Enter a character: a
a is a lowercase character.
```

11

Write a c program to input week number and print weekday

INPUT

OUTPUT

```
Enter the week number (1-7): 5
Friday
```

12

Write a c program to input month number and print number of days in that month

INPUT

```c
#include <stdio.h>
int main() {
    int monthNumber;
    printf("Enter the month number (1-12): ");
    scanf("%d", &monthNumber);
    if (monthNumber >= 1 && monthNumber <= 12) {
        int daysInMonth;
        if (monthNumber == 4 ||
            monthNumber == 6 ||
            monthNumber == 9 ||
            monthNumber == 11) {
            daysInMonth = 30;
        } else if (monthNumber == 2) {
            daysInMonth = 28;
        } else {
            daysInMonth = 31;
        }
        printf("The month with number %d has %d days.\n", monthNumber, daysInMonth);
    } else {
        printf("Invalid month number. Please enter a number between 1 and 12.\n");
    }
    return 0;
}
```

Run

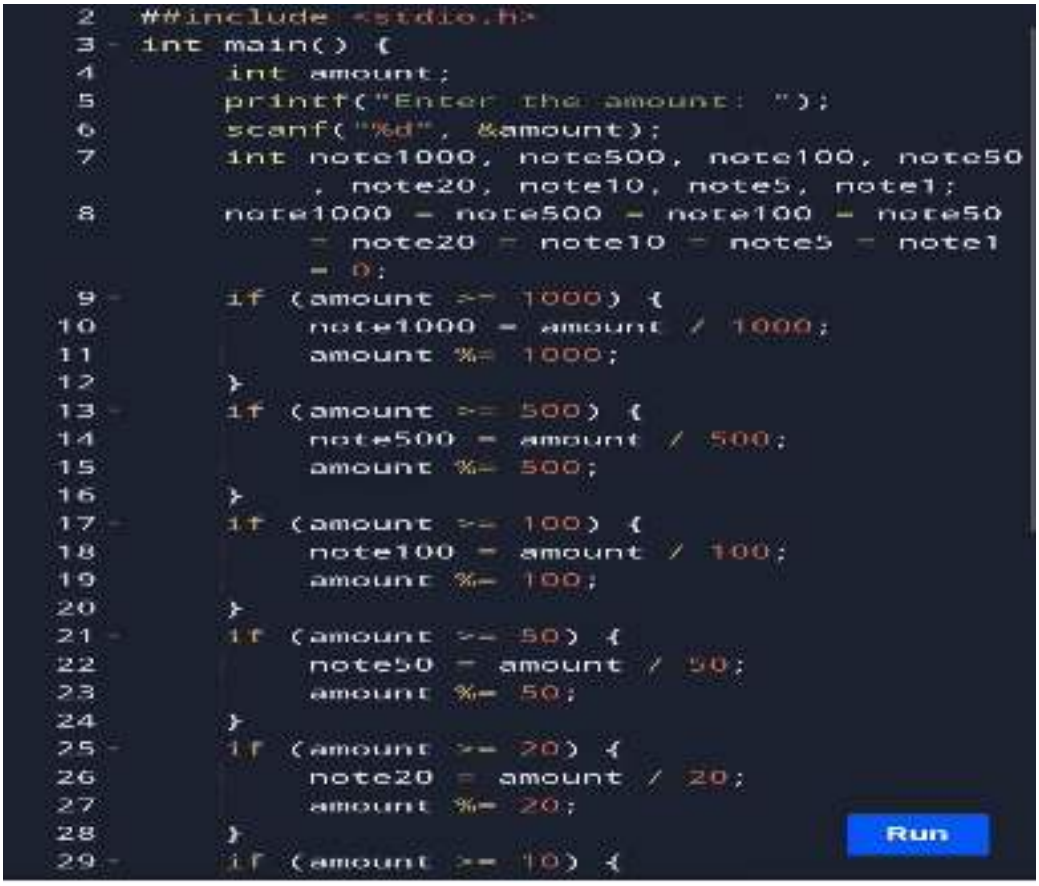
OUTPUT

```
Enter the month number (1-12): 10
The month with number 10 has 31 days.
```

13

Write a c program to count total number of notes in given amount

INPUT



```c
##include <stdio.h>
int main() {
    int amount;
    printf("Enter the amount: ");
    scanf("%d", &amount);
    int note1000, note500, note100, note50
        , note20, note10, note5, note1;
    note1000 = note500 = note100 = note50
        = note20 = note10 = note5 = note1
        = 0;
    if (amount >= 1000) {
        note1000 = amount / 1000;
        amount %= 1000;
    }
    if (amount >= 500) {
        note500 = amount / 500;
        amount %= 500;
    }
    if (amount >= 100) {
        note100 = amount / 100;
        amount %= 100;
    }
    if (amount >= 50) {
        note50 = amount / 50;
        amount %= 50;
    }
    if (amount >= 20) {
        note20 = amount / 20;
        amount %= 20;
    }
    if (amount >= 10) {
```

Run

```
    }
    if (amount >= 50) {
        note50 = amount / 50;
        amount %= 50;
    }
    if (amount >= 20) {
        note20 = amount / 20;
        amount %= 20;
    }
    if (amount >= 10) {
        note10 = amount / 10;
        amount %= 10;
    }
    if (amount >= 5) {
        note5 = amount / 5;
        amount %= 5;
    }
    if (amount >= 1) {
        note1 = amount;
    }
    printf("Notes Count:\n");
    printf("1000 x %d\n", note1000);
    printf("500 x %d\n", note500);
    printf("100 x %d\n", note100);
    printf("50 x %d\n", note50);
    printf("20 x %d\n", note20);
    printf("10 x %d\n", note10);
    printf("5 x %d\n", note5);
    printf("1 x %d\n", note1);
    return 0;
}
```

Run

OUTPUT

```
Enter the amount: 100
Notes Count:
1000 x 0
500 x 0
100 x 1
50 x 0
20 x 0
10 x 0
5 x 0
1 x 0
```

Write a c program to input angles of triangle and check whether triangle is valid or not

INPUT

```c
#include <stdio.h>
int main() {
    float angle1, angle2, angle3;
    printf("Enter the first angle: ");
    scanf("%f", &angle1);
    printf("Enter the second angle: ");
    scanf("%f", &angle2);
    printf("Enter the third angle: ");
    scanf("%f", &angle3);
    if (angle1 + angle2 + angle3 == 180) {
        printf("The angles form a valid
            triangle.\n");
    } else {
        printf("The angles do not form a
            valid triangle.\n");
    }

    return 0;
}
```

OUTPUT

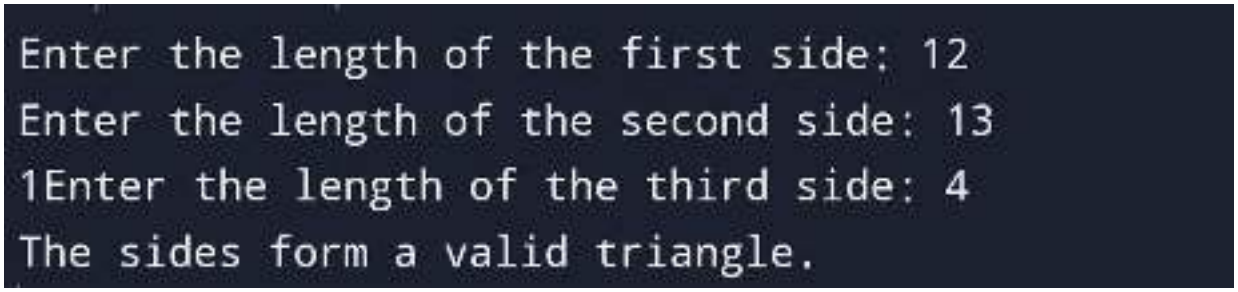
```
Enter the first angle: 12
Enter the second angle: 12
1Enter the third angle: 3
The angles do not form a valid triangle.
```

Write a c program to input all sides of a triangle and check whether triangle is valid or not

INPUT

```c
#include <stdio.h>
int main() {
    float side1, side2, side3;
    printf("Enter the length of the first side: ");
    scanf("%f", &side1);
    printf("Enter the length of the second side: ");
    scanf("%f", &side2);
    printf("Enter the length of the third side: ");
    scanf("%f", &side3);
    if (side1 + side2 > side3 && side1 + side3 > side2 && side2 + side3 > side1) {
        printf("The sides form a valid triangle.\n");
    } else {
        printf("The sides do not form a valid triangle.\n");
    }
    return 0;
}
```

OUTPUT



```
Enter the length of the first side: 12
Enter the length of the second side: 13
1Enter the length of the third side: 4
The sides form a valid triangle.
```

16

Write a program to check whether

or scalene triangle ,isosceles , the triangle is equilateral

INPUT

```c
#include <stdio.h>
int main() {float side1, side2, side3;
    printf("Enter the length of the first
        side: ");
    scanf("%f", &side1);
    printf("Enter the length of the second
        side: ");
    scanf("%f", &side2);
    printf("Enter the length of the third
        side: ");
    scanf("%f", &side3);
    if (side1 == side2 && side2 == side3)
        {
        printf("It's an equilateral
            triangle.\n");
    } else if (side1 == side2 || side1 ==
        side3 || side2 == side3) {
        printf("It's an isosceles triangle
            .\n");
    } else {
        printf("It's a scalene triangle
            .\n");
    }
    return 0;
}
```

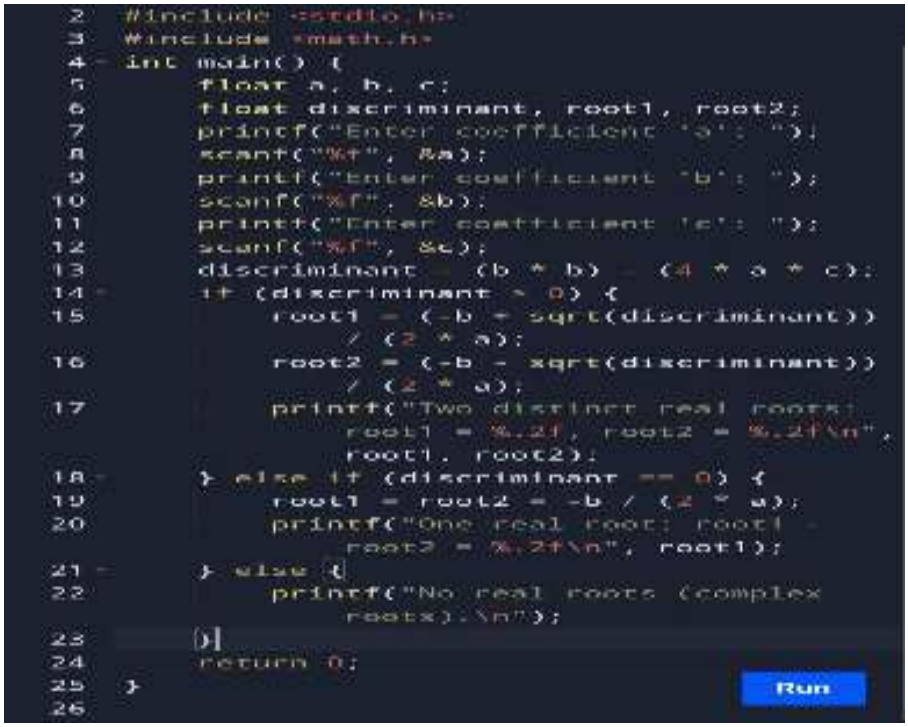
OUTPUT

```
Enter the length of the first side: 19
Enter the length of the second side: 12
Enter the length of the third side: 13
It's a scalene triangle.
```

17

Write a c program to find all roots of a quadratic equation

INPUT



```c
#include <stdio.h>
#include <math.h>
int main() {
    float a, b, c;
    float discriminant, root1, root2;
    printf("Enter coefficient 'a': ");
    scanf("%f", &a);
    printf("Enter coefficient 'b': ");
    scanf("%f", &b);
    printf("Enter coefficient 'c': ");
    scanf("%f", &c);
    discriminant = (b * b) - (4 * a * c);
    if (discriminant > 0) {
        root1 = (-b + sqrt(discriminant))
            / (2 * a);
        root2 = (-b - sqrt(discriminant))
            / (2 * a);
        printf("Two distinct real roots:
            root1 = %.2f, root2 = %.2f\n",
            root1, root2);
    } else if (discriminant == 0) {
        root1 = root2 = -b / (2 * a);
        printf("One real root: root1 =
            root2 = %.2f\n", root1);
    } else {
        printf("No real roots (complex
            roots):\n");
    }
    return 0;
}
```

Run

OUTPUT

```
Enter coefficient 'a': 9
Enter coefficient 'b': 16
Enter coefficient 'c': 8
No real roots (complex roots).
```

18

.Write a c program to calculate profit or loss

INPUT

Output

```
Enter the cost price: 12
Enter the selling price: 23
Profit: 11.00
```

Write a c program to input marks of
five subjects physics chemistry biology mathematics and computer
calculate percentage and grade according to following:

grade A : Percentage >=90%

grade B : Percentage >=80%

grade C : Percentage >=70%

grade D : Percentage >=60%

INPUT

```c
#include <stdio.h>
int main() {
    float physics, chemistry, biology,
        mathematics, computer;
    float totalMarks, percentage;
    char grade;
    printf("Enter marks in Physics: ");
    scanf("%f", &physics);
    printf("Enter marks in Chemistry: ");
    scanf("%f", &chemistry);
    printf("Enter marks in Biology: ");
    scanf("%f", &biology);
    printf("Enter marks in Mathematics: "
        );
    scanf("%f", &mathematics);
    printf("Enter marks in Computer: ");
    scanf("%f", &computer);
    totalMarks = physics + chemistry +
        biology + mathematics + computer;
    percentage = (totalMarks / 500) * 100;
    if (percentage >= 90) {
        grade = 'A';
    } else if (percentage >= 80) {
        grade = 'B';
    } else if (percentage >= 70) {
        grade = 'C';
    } else if (percentage >= 60) {
        grade = 'D';
    } else if (percentage >=50){
        grade ='E';
    } else {
```

Run

OUTPUT

```
Enter marks in Physics: 50
Enter marks in Chemistry: 56
Enter marks in Biology: 67
Enter marks in Mathematics: 78
Enter marks in Computer: 79
Percentage: 66.00%
Grade: D
```

21

Write a c program to input basic salary of an employee and calculate its gross salary according to

DA =80%, HRA = 20% : Basic salary <= 10000

DA = 90% ,HRA=25% : Basic salary <= 20000

DA =95% ,HRA=30%: Basic salary >20000

INPUT

```c
#include <stdio.h>
int main() {
    float basicSalary, grossSalary;
    float hra, da;
    printf("Enter the basic salary: ");
    scanf("%f", &basicSalary);
    if (basicSalary <= 10000) {
        hra = 0.20 * basicSalary;
        da = 0.80 * basicSalary;
    } else if (basicSalary <= 20000) {
        hra = 0.25 * basicSalary;
        da = 0.90 * basicSalary;
    } else {
        hra = 0.30 * basicSalary;
        da = 0.95 * basicSalary;
    }
    grossSalary = basicSalary + hra + da;
    printf("Gross Salary: %.2f\n",
        grossSalary);
    return 0;
}
```

T T

OUTPUT

22

Write a c program to input electricity unit charges and calculate total electricity bill according

0.50/unit .For first 50 units rs

O.75/unit .For next 100 ubits rs

1.20/unit .For next 100 units rs

1.50/unit .For unit above 250 rs

An additional charges of 20% is added to the bill

INPUT

```c
#include <stdio.h>
int main() {
    float units, totalBill;
    float additionalCharge = 0.20;
    printf("Enter the electricity units
        consumed: ");
    scanf("%f", &units);
    if (units <= 50) {
        totalBill = units * 0.50;
    } else if (units <= 150) {
        totalBill = 50 * 0.50 + (units -
            50) * 0.75;
    } else if (units <= 250) {
        totalBill = 50 * 0.50 + 100 * 0.75
            + (units - 150) * 1.20;
    } else {
        totalBill = 50 * 0.50 + 100 * 0.75
            + 100 * 1.20 + (units - 250) *
            1.50;
    }
    totalBill += additionalCharge *
        totalBill;
    printf("Total Electricity Bill: Rs. %
        .2f\n", totalBill);
    return 0;
}
```

OUTPUT

```
Enter the electricity units consumed: 200
Total Electricity Bill: Rs. 192.00
```

24

Write a c program to convert specified days into years weeks and days

include <stdio.h>

Int main()

}

weeks; ,years ,Int days

days = 1329;

INPUT

```c
#include <stdio.h>
int main() {
    int days, years, weeks;
    days = 1329;
    years = days / 365;
    days %= 365;
    weeks = days / 7;
    days %= 7;
    printf("%d days is equivalent to %d
        years, %d weeks, and %d days.\n",
        1329, years, weeks, days);
    return 0;
}
```

OUTPUT

```
1329 days is equivalent to 3 years, 33 weeks,
    and 3 days.
```

84

Write a program in c to read n number of values in an array and display them in reverse order

INPUT

```c
#include <stdio.h>
int main() {
    int n;
    printf("Enter the number of values: "
        );
    scanf("%d", &n);
    int values[n];
    printf("Enter %d values:\n", n);
    for (int i = 0; i < n; i++) {
        scanf("%d", &values[i]);
    }
    printf("Values in reverse order:\n");
    for (int i = n - 1; i >= 0; i--) {
        printf("%d\n", values[i]);
    }
    return 0;
}
```

OUTPUT

```
Enter the number of values: 4
Enter 4 values:
12
23
43
45
Values in reverse order:
45
43
23
12
```

85

Write a program in c to find the sum of all elements of the array

INPUT

```c
#include <stdio.h>
int main() {
    int n, sum = 0;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter %d elements:\n", n);
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    for (int i = 0; i < n; i++) {
        sum += arr[i];
    }
    printf("Sum of all elements: %d\n", sum);
    return 0;
}
```

OUTPUT

```
Enter the number of elements: 4
Enter 4 elements:
12
56
78
43
Sum of all elements: 189
```

86

Write a program in c to copy the elements of one array into another array

INPUT

```c
#include <stdio.h>
int main() {
    int n;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    int sourceArray[n], copyArray[n];
    printf("Enter %d elements for the source array:\n", n);
    for (int i = 0; i < n; i++) {
        scanf("%d", &sourceArray[i]);
    }
    for (int i = 0; i < n; i++) {
        copyArray[i] = sourceArray[i];
    }
    printf("Copied elements in the copy array:\n");
    for (int i = 0; i < n; i++) {
        printf("%d\n", copyArray[i]);
    }
    return 0;
}
```

OUTPUT

```
Enter the number of elements: 5
Enter 5 elements for the source array:
56
87
12
23
90
Copied elements in the copy array:
56
87
12
23
90
```

87

Write a program in c to count the total number of duplicate elements in an array

INPUT

```c
#include <stdio.h>
int main() {
    int n, count = 0;
    printf("Enter the number of elements:
        ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter %d elements:\n", n);
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    for (int i = 0; i < n; i++) {
        for (int j = i + 1; j < n; j++) {
            if (arr[i] == arr[j]) {
                count++;
                break;
            }
        }
    }
    printf("Total number of duplicate
        elements: %d\n", count);
    return 0;
}
```

OUTPUT

```
Enter the number of elements: 4
Enter 4 elements:
12
23
45
23
Total number of duplicate elements: 1
```

88

Write a program in c to find the maximum and minimum elements in an array

INPUT

```c
#include <stdio.h>
int main() {
    int n, max, min;
    printf("Enter the number of elements: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter %d elements:\n", n);
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    max = min = arr[0];
    for (int i = 1; i < n; i++) {
        if (arr[i] > max) {
            max = arr[i];
        }
        if (arr[i] < min) {
            min = arr[i];
        }
    }
    printf("Maximum element: %d\n", max);
    printf("Minimum element: %d\n", min);
    return 0;
}
```

INPUT

```
Enter the number of elements: 4
Enter 4 elements:
23
43
54
78
Maximum element: 78
Minimum element: 3
```

89

Write a c program to sort the elements of an array in descending order

INPUT

```c
#include <stdio.h>
void bubbleSort(int arr[], int n) {
    for (int i = 0; i < n - 1; i++) {
        for (int j = 0; j < n - i - 1; j
            ++) {
            if (arr[j] < arr[j + 1]) {
                int temp = arr[j];
                arr[j] = arr[j + 1];
                arr[j + 1] = temp;        }
                                  }  }}
int main() {
    int n;
    printf("Enter the number of elements
        in the array: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter the elements of the
        array:\n");
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]); }
    bubbleSort(arr, n);
    printf("Array sorted in descending
        order: ");
    for (int i = 0; i < n; i++) {
        printf("%d ", arr[i]);   }
    return 0;
}
```

OUTPUT

```
Enter the number of elements in the array: 4
Enter the elements of the array:
12
56
74
34
2Array sorted in descending order: 56 34 12 4
```

90

Write a c program in c to seprate odd and even integers into seprate array

INPUT

```c
#include <stdio.h>
int main() {
    int inputArray[] = {1, 2, 3, 4, 5, 6,
        7, 8, 9, 10};
    int evenArray[10], oddArray[10];
    int evenCount = 0, oddCount = 0;
    int size = sizeof(inputArray) / sizeof
        (inputArray[0]);
    for (int i = 0; i < size; i++) {
        if (inputArray[i] % 2 == 0) {
            evenArray[evenCount] =
                inputArray[i];
            evenCount++;
        } else {
            oddArray[oddCount] =
                inputArray[i];
            oddCount++;
        }
    }
    printf("Even numbers: ");
    for (int i = 0; i < evenCount; i++) {
        printf("%d ", evenArray[i]);
    }
    printf("\nOdd numbers: ");
    for (int i = 0; i < oddCount; i++) {
        printf("%d ", oddArray[i]);
    }
    return 0;
}
```

Run

OUTPUT

```
Even numbers: 2 4 6 8 10
Odd numbers: 1 3 5 7 9
```

91

Write a program in c to merge two arrays of the same size sorted in descending/ascending order

INPUT

```c
        while (i < size && j < size) {
            if (arr1[i] > arr2[j]) {
                mergedArr[k++] = arr1[i++]
                    ;
            } else {
                mergedArr[k++] = arr2[j++]
                    ;
            }       }   }
    while (i < size) {
        mergedArr[k++] = arr1[i++];
    }
    while (j < size) {
        mergedArr[k++] = arr2[j++];
    }
}
int main() {
    int arr1[] = {1, 3, 5, 7, 9};
    int arr2[] = {2, 4, 6, 8, 10};
    int size = sizeof(arr1) / sizeof
        (arr1[0]);
    int mergedArr[size * 2];
    mergeArrays(arr1, arr2, size,
        mergedArr, 1);
    printf("Merged array in ascending
        order: ");
    for (int i = 0; i < size * 2; i++) {
        printf("%d ", mergedArr[i]);
    }
    return 0;
}
```

Run

OUTPUT

```
Merged array in ascending order: 1 2 3 4 5 6 7 8
    9 10
```

92

Write a program in c to merge two arrays of the same size sorted in descending order

INPUT

```c
#include <stdio.h>
void mergeArrays(int arr1[], int arr2[],
    int size, int mergedArr[]) {
    int i = 0, j = 0, k = 0;
    while (i < size && j < size) {
        if (arr1[i] >= arr2[j]) {
            mergedArr[k++] = arr1[i++];
        } else {
            mergedArr[k++] = arr2[j++];
        }
    }
    while (i < size) {
        mergedArr[k++] = arr1[i++];
    }
    while (j < size) {
        mergedArr[k++] = arr2[j++];
    }
}
int main() {
    int arr1[] = {9, 7, 5, 3, 1};
    int arr2[] = {10, 8, 6, 4, 2};
    int size = sizeof(arr1) / sizeof
        (arr1[0]);
    int mergedArr[size * 2];
    mergeArrays(arr1, arr2, size,
        mergedArr);
    printf("Merged array in descending
        order: ");
```

Run

OUTPUT

```
Merged array in descending order: 10 9 8 7 6 5 4
    3 2 1
```

93

Consider two matrices of the size m and : WAP using Switch case Show these things in .Implement matrix operation and display .n program l) Read matrix elements and display 2) Matrix Multiplication and display 3) addition of matrix and display 4)Subtraction of Matrix and display 5)Transpose of Matrix and display

INPUT

```c
#include <stdio.h>
void readMatrix(int matrix[][10], int m,
    int n) {
    printf("Enter matrix elements:\n");
    for (int i = 0; i < m; i++) {
        for (int j = 0; j < n; j++) {
            scanf("%d", &matrix[i][j]);
        }
    }
}
void displayMatrix(int matrix[][10], int m
    , int n) {
    printf("Matrix:\n");
    for (int i = 0; i < m; i++) {
        for (int j = 0; j < n; j++) {
            printf("%d\t", matrix[i][j]);
        }
        printf("\n");
    }
}
void matrixMultiplication(int mat1[][10],
    int mat2[][10], int result[][10], int
    m, int n, int p) {
    for (int i = 0; i < m; i++) {
        for (int j = 0; j < p; j++) {
            result[i][j] = 0;
            for (int k = 0; k < n; k++) {
                result[i][j] += ma
                    * mat2[k][j];
```

Run

```
            }
        }
    }
}
void matrixAddition(int mat1[][10], int
    mat2[][10], int result[][10], int m,
    int n) {
    for (int i = 0; i < m; i++) {
        for (int j = 0; j < n; j++) {
            result[i][j] = mat1[i][j] +
                mat2[i][j];
        }
    }
}
void matrixSubtraction(int mat1[][10], int
    mat2[][10], int result[][10], int m,
    int n) {
    for (int i = 0; i < m; i++) {
        for (int j = 0; j < n; j++) {
            result[i][j] = mat1[i][j] -
                mat2[i][j];
        }
    }
}
void transposeMatrix(int matrix[][10], int
    transpose[][10], int m, int n) {
    for (int i = 0; i < m; i++) {
        for (int j = 0; j < n; j++) {
            transpose[j][i] = matrix[i][j]
                ;
        }
```

Run

```c
    }
}
int main() {
    int m, n, p;
    printf("Enter the number of rows and
        columns for the first matrix: ");
    scanf("%d %d", &m, &n);
    int matrix1[10][10], matrix2[10][10],
        result[10][10], transpose[10][10];
    printf("Matrix 1:\n");
    readMatrix(matrix1, m, n);
    printf("Matrix 2:\n");
    readMatrix(matrix2, m, n);
    int choice;
    printf("Select operation:\n");
    printf("1. Display Matrices\n");
    printf("2. Matrix Multiplication\n");
    printf("3. Matrix Addition\n");
    printf("4. Matrix Subtraction\n");
    printf("5. Transpose of Matrix\n");
    scanf("%d", &choice);
    switch (choice) {
        case 1:
            displayMatrix(matrix1, m, n);
            displayMatrix(matrix2, m, n);
            break;
        case 2:
            matrixMultiplication(matrix1,
                matrix2, result, m, n, n);
            displayMatrix(result,
            break;
```

Run

```
73              case 2:
74                  matrixMultiplication(matrix1,
                        matrix2, result, m, n, n);
75                  displayMatrix(result, m, n);
76                  break;
77              case 3:
78                  matrixAddition(matrix1,
                        matrix2, result, m, n);
79                  displayMatrix(result, m, n);
80                  break;
81              case 4:
82                  matrixSubtraction(matrix1,
                        matrix2, result, m, n);
83                  displayMatrix(result, m, n);
84                  break;
85              case 5:
86                  transposeMatrix(matrix1,
                        transpose, m, n);
87                  displayMatrix(transpose, n, m
                        );
88                  transposeMatrix(matrix2,
                        transpose, m, n);
89                  displayMatrix(transpose, n, m
                        );
90                  break;
91              default:
92                  printf("Invalid choice\n");
93          }
94      return 0;
95  }
```

Run

OUTPUT

```
Enter the number of rows and columns for the
    first matrix: 2 3
Matrix 1:
Enter matrix elements:
Matrix 2:
Enter matrix elements:
Select operation:
1. Display Matrices
2. Matrix Multiplication
3. Matrix Addition
4. Matrix Subtraction
5. Transpose of Matrix
Invalid choice
```

94

Write a program in C to copy the elements of one array into another array

INPUT

```c
#include <stdio.h>
int main() {
    int sourceArray[] = {1, 2, 3, 4, 5};
    int destinationArray[5];
    int size = sizeof(sourceArray) /
        sizeof(sourceArray[0]);
    for (int i = 0; i < size; i++) {
        destinationArray[i] =
            sourceArray[i];
    }
    printf("Source Array: ");
    for (int i = 0; i < size; i++) {
        printf("%d ", sourceArray[i]);
    }
    printf("\nCopied Array: ");
    for (int i = 0; i < size; i++) {
        printf("%d ", destinationArray[i]
            );
    }
    return 0;
}
```

OUTPUT

```
Source Array: 1 2 3 4 5
Copied Array: 1 2 3 4 5
```

95

Write a program in C to read n number of values in an array and display them in reverse order

INPUT

```c
#include <stdio.h>
int main() {
    int n;
    printf("Enter the number of values: "
        );
    scanf("%d", &n);
    int values[n];
    printf("Enter %d values:\n", n);
    for (int i = 0; i < n; i++) {
        scanf("%d", &values[i]);
    }
    printf("Values in reverse order:\n");
    for (int i = n - 1; i >= 0; i--) {
        printf("%d\n", values[i]);
    }
    return 0;
}
```

OUTPUT

```
Enter the number of values: 3
Enter 3 values:
12
34
65
Values in reverse order:
65
34
12
```

96

array Write a program in C to find the sum of all elements of the

INPUT

```c
#include <stdio.h>
int main() {
    int n;
    printf("Enter the number of elements in the array: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter the elements of the array:\n");
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    int sum = 0;
    for (int i = 0; i < n; i++) {
        sum += arr[i];
    }
    printf("Sum of all elements in the array: %d\n", sum);
    return 0;
}
```

OUTPUT

```
Enter the number of elements in the array: 3
Enter the elements of the array:
12
43
56
Sum of all elements in the array: 111
```

97

Write a program in C to separate odd and even integers into separate arrays

INPUT

```c
#include <stdio.h>
int main() {
    int n;
    printf("Enter the number of elements
        in the array: ");
    scanf("%d", &n);
    int arr[n];
    int evenArr[n], oddArr[n];
    int evenCount = 0, oddCount = 0;
    printf("Enter the elements of the
        array:\n");
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    for (int i = 0; i < n; i++) {
        if (arr[i] % 2 == 0) {
            evenArr[evenCount] = arr[i];
            evenCount++;
        } else {
            oddArr[oddCount] = arr[i];
            oddCount++;
        }
    }
    printf("Even integers: ");
    for (int i = 0; i < evenCount; i++) {
        printf("%d ", evenArr[i]);
    }
    printf("\n");
    printf("Odd integers: ");
```

Run

OUTPUT

```
Enter the number of elements in the array: 3
Enter the elements of the array:
12
34
67
Even integers: 12 4
Odd integers: 67
```

98

Write a program in C to find the transpose of a given matrix

INPUT

```c
    printf("Enter the number of rows of
        the matrix: ");
    scanf("%d", &m);
    printf("Enter the number of columns of
        the matrix: ");
    scanf("%d", &n);
    int matrix[m][n];
    int transpose[n][m];
    printf("Enter the elements of the
        matrix:\n");
    for (int i = 0; i < m; i++) {
        for (int j = 0; j < n; j++) {
            scanf("%d", &matrix[i][j]);
        }
    }
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < m; j++) {
            transpose[i][j] = matrix[j][i]
                ;
        }
    }
    printf("Transpose of the matrix:\n");
    for (int i = 0; i < n; i++) {
        for (int j = 0; j < m; j++) {
            printf("%d ", transpose[i][j]
                );
        }
        printf("\n");
    }
    return 0;
}
```

Run

OUTPUT

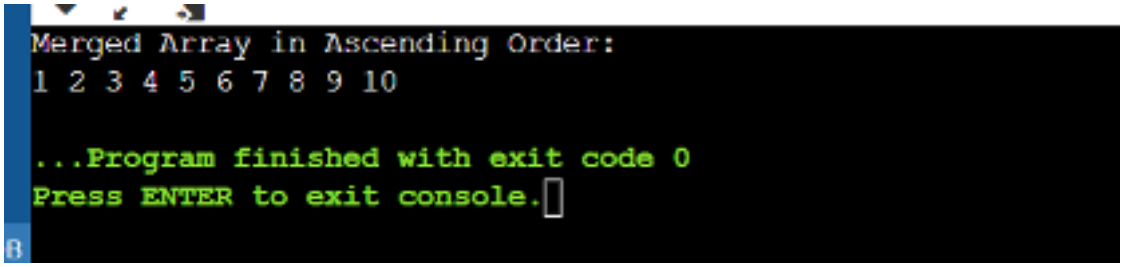
```
Enter the number of rows of the matrix: 2
Enter the number of columns of the matrix: 2
Enter the elements of the matrix:
1,2,3,4
Transpose of the matrix:
1 4198846
0 0
```

99

Write a program in C to merge two arrays of the same size sorted in descending/ascending order

Input

OUTPUT



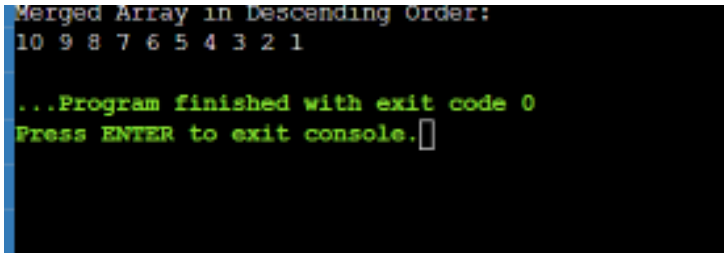
100

Write a program in C to merge two arrays of the same size sorted in descending order

INPUT

```
#include <stdio.h>
void mergeArrays(int arr1[], int arr2[], int size, int mergedArr[]) {
    int i = 0, j = 0, k = 0;
    while (i < size && j < size) {
        if (arr1[i] > arr2[j]) {
            mergedArr[k++] = arr1[i++];
        } else {
            mergedArr[k++] = arr2[j++];
        }
    }
    while (i < size) {
        mergedArr[k++] = arr1[i++];
    }
    while (j < size) {
        mergedArr[k++] = arr2[j++];
    }
}
int main() {
    int size = 5;
    int arr1[] = {9, 7, 5, 3, 1};
    int arr2[] = {10, 8, 6, 4, 2};
    int mergedArr[2 * size];
    mergeArrays(arr1, arr2, size, mergedArr);
    printf("Merged Array in Descending Order:\n");
    for (int i = 0; i < 2 * size; i++) {
        printf("%d ", mergedArr[i]);
    }

    return 0;
}
```

OUTPUT



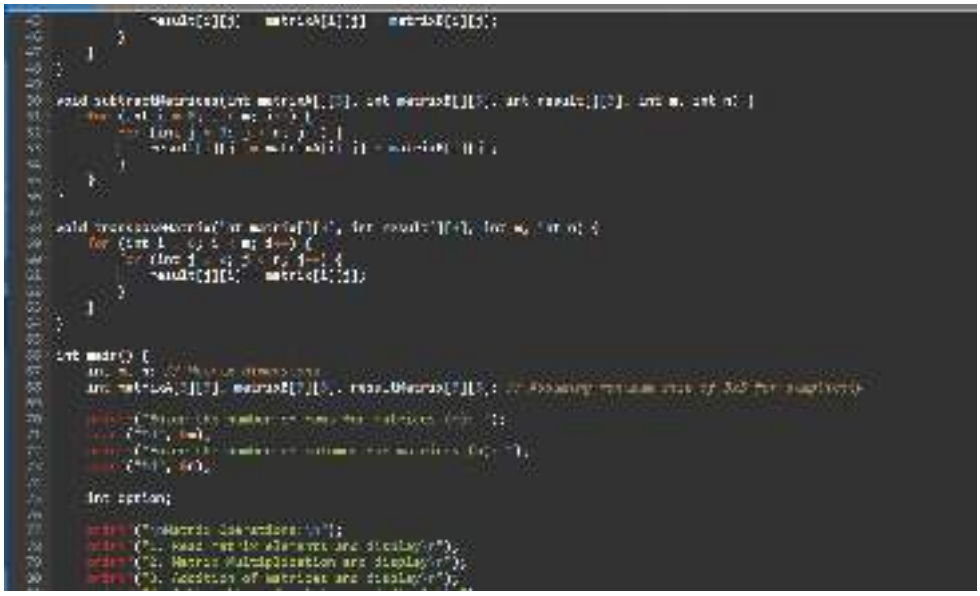
```
Merged Array in Descending Order:
10 9 8 7 6 5 4 3 2 1

...Program finished with exit code 0
Press ENTER to exit console.
```

101

.Consider two matrices of the size m and n :WAP using Switch case Implement matrix operation

Show these things in program 1) Read matrix .and display elements and display 2) Matrix Multiplication and display 3) addition of matrix and display 4)Subtraction of Matrix and display Transpose of Matrix and display.(5

INPUT



```
81      printf("4. Subtraction of matrices and display\n");
82      printf("5. Transpose of matrices and display\n");
83      printf("Enter your choice (1 to 5): ");
84      scanf("%d", &option);
85
86      switch (option) {
87          case 1:
88              printf("\nEnter elements for Matrix A:\n");
89              readMatrix(matrixA, m, n);
90
91              printf("\nEnter elements for Matrix B:\n");
92              readMatrix(matrixB, m, n);
93
94              printf("\nDisplaying Matrix A:\n");
95              displayMatrix(matrixA, m, n);
96
97              printf("\nDisplaying Matrix B:\n");
98              displayMatrix(matrixB, m, n);
99              break;
100
101         case 2:
102             printf("\nEnter elements for Matrix A:\n");
103             readMatrix(matrixA, m, n);
104
105             printf("\nEnter elements for Matrix B:\n");
106             readMatrix(matrixB, n, m);
107
108             multiplyMatrices(matrixA, matrixB, resultMatrix, m, n, m);
109
110             printf("\nDisplaying Resultant Matrix (Matrix A * Matrix B):\n");
111             displayMatrix(resultMatrix, m, m);
112             break;
113
114         case 3:
115             printf("\nEnter elements for Matrix A:\n");
116             readMatrix(matrixA, m, n);
```

```
113
114         case 3:
115             printf("\nEnter elements for Matrix A:\n");
116             readMatrix(matrixA, m, n);
117
118             printf("\nEnter elements for Matrix B:\n");
119             readMatrix(matrixB, m, n);
120
121             addMatrices(matrixA, matrixB, resultMatrix, m, n);
122
123             printf("\nDisplaying Resultant Matrix (Matrix A + Matrix B):\n");
124             displayMatrix(resultMatrix, m, n);
125             break;
126
127         case 4:
128             printf("\nEnter elements for Matrix A:\n");
129             readMatrix(matrixA, m, n);
130
131             printf("\nEnter elements for Matrix B:\n");
132             readMatrix(matrixB, m, n);
133
134             subtractMatrices(matrixA, matrixB, resultMatrix, m, n);
135
136             printf("\nDisplaying Resultant Matrix (Matrix A - Matrix B):\n");
137             displayMatrix(resultMatrix, m, n);
138             break;
139
140         case 5:
141             printf("\nEnter elements for Matrix A:\n");
142             readMatrix(matrixA, m, n);
143
144             transposeMatrix(matrixA, resultMatrix, m, n);
145
146             printf("\nDisplaying Transpose of Matrix A:\n");
147             displayMatrix(resultMatrix, n, m);
148             break;
```

OUTPUT

```
Enter the number of rows for matrices (m): 2
Enter the number of columns for matrices (n): 2

Matrix Operations:
1. Read matrix elements and display
2. Matrix multiplication and display
3. Addition of matrices and display
4. Subtraction of matrices and display
5. Transpose of matrices and display
Enter your choice (1 to 5): 1

Enter elements for Matrix A:
Enter matrix elements:
Enter element at position [1][1]: 2
Enter element at position [1][2]: 4
Enter element at position [2][1]: 5
Enter element at position [2][2]: 6

Enter elements for Matrix B:
Enter matrix elements:
Enter element at position [1][1]: 9
Enter element at position [1][2]: 7
Enter element at position [2][1]: 5
Enter element at position [2][2]: 4

Displaying Matrix A:
Matrix elements:
2       4
5       6

Displaying Matrix B:
```

```
4. Subtraction of matrices and display
5. Transpose of matrices and display
Enter your choice (1 to 5): 1

Enter elements for Matrix A:
Enter matrix elements:
Enter element at position [1][1]: 2
Enter element at position [1][2]: 4
Enter element at position [2][1]: 5
Enter element at position [2][2]: 6

Enter elements for Matrix B:
Enter matrix elements:
Enter element at position [1][1]: 9
Enter element at position [1][2]: 7
Enter element at position [2][1]: 5
Enter element at position [2][2]: 4

Displaying Matrix A:
Matrix elements:
2       4
5       6

Displaying Matrix B:
Matrix elements:
9       7
5       4


...Program finished with exit code 0
Press ENTER to exit console.
```

102

1+2+3+4+5+6+.....n

INPUT

```c
#include<stdio.h>
int main(){
    int n;
    int sum=0;
    printf("Name : DRISHTI JUYAL\n");

    printf("Enter value of n:");
    scanf("%d",&n);

    for(int i=0; i<=n; i++)
    {
        sum=sum+i;
    }
    printf("\nThe sum of series 1+2+3+4+5+6+.....+n is : %d",sum);

return 0;
}
```

OUTPUT

```
Name : DRISHTI JUYAL
Enter value of n:12

The sum of series 1+2+3+4+5+6+.....+n is : 78

...Program finished with exit code 0
Press ENTER to exit console.
```

103

1+3+5+7+11+13+17+.....N

INPUT

```c
#include<stdio.h>
//function to check prime number
int prime_num(int n)
{
    if (n<=1){
        return 0;
    }
    for(int i=2;i*i<=n;i++)
    {
        if (n%i==0)
        {
            return 0;
        }

    }
    return 1;
}
//function for sum
int Sum_of_p(int num)
{
    int sum = 0;
    for(int i=2;i<=num;i++)
    { if (prime_num(i))
    {
        sum+=i;
    }
}
return sum;
}
int main(){
    int n;
    printf("NAME: DRISHTI JUYAL");

    printf("\nEnter n:");
    scanf("%d",&n);
    printf("NAME: DRISHTI JUYAL");

    printf("\nEnter n:");
    scanf("%d",&n);
    int sum = Sum_of_p(n) ;
    printf("\nThe sum of 1+3+5+7+11+13+17....+%d is :%d",n,sum);


return 0;
}
```

OUTPUT

```
NAME: DRISHTI JUYAL
Enter n:12

The sum of 1+3+5+7+11+13+17....+12 is :28

...Program finished with exit code 0
Press ENTER to exit console.
```

104

1+3+5+7+9+11+13+.....+N

INPUT

```c
#include<stdio.h>
int odd(int n)
{
    if (n%2==0)
    {
        return 0;
    }
}
int sum_(int num)
{
    int sum= 0;
    for (int i = 0; i <=num; i++)
    {
    if (odd(i))
    {
        sum=sum+i;
    }
    }
    return sum;
}
int main(){
    int n;
     printf("NAME: DRISHTI JUYAL");
     printf("\nEnter n:");
     scanf("%d",&n);
     int sum= sum_(n);
     printf("\nThe sum of 1+3+5+7+9...+%d is : %d",n,sum);

return 0;
}
```

OUTPUT

```
NAME: DRISHTI JUYAL
Enter n:12

The sum of 1+3+5+7+9...+12 is : 36

...Program finished with exit code 0
Press ENTER to exit console.
```

105

2+4+6+8+10+.....+N

INPUT

```c
#include<stdio.h>
int Sum_(int n)
{
    int sum =0;

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

        sum+=i;

    }
    return sum;

}s
int main(){
    int n;

    printf("NAME: DRISHTI JUYAL");
    printf("\nEnter n:");
    scanf("%d",&n);
    int dot= Sum_(n);
    printf("\nThe sum of 2+4+6+8+10+12...+%d is : %d",n,dot);


return 0;
}
```

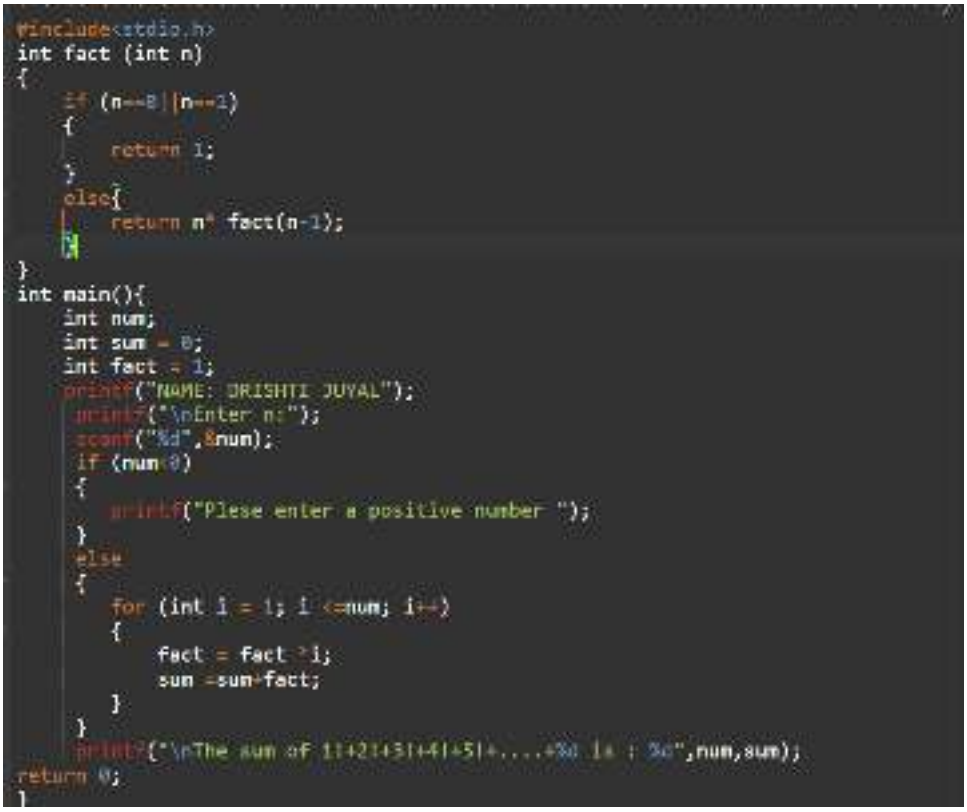
OUTPUT

```
NAME: DRISHTI JUYAL
Enter n:12

The sum of 2+4+6+8+10+12...+12 is : 42

...Program finished with exit code 0
Press ENTER to exit console.
```

106

1!+2!+3!+4!+.....+n!

INPUT



```c
#include<stdio.h>
int fact (int n)
{
    if (n==0||n==1)
    {
        return 1;
    }
    else{
        return n* fact(n-1);
    }
}
int main(){
    int num;
    int sum = 0;
    int fact = 1;
    printf("NAME: DRISHTI JUYAL");
    printf("\nEnter n:");
    scanf("%d",&num);
    if (num<0)
    {
        printf("Plese enter a positive number ");
    }
    else
    {
        for (int i = 1; i <=num; i++)
        {
            fact = fact *i;
            sum =sum+fact;
        }
    }
    printf("\nThe sum of 1!+2!+3!+4!+5!+....+%d is : %d",num,sum);
return 0;
}
```

OUTPUT

```
NAME: DRISHTI JUYAL
Enter n:12

The sum of 1!+2!+3!+4!+5!+....+12 is : 522956313

...Program finished with exit code 0
Press ENTER to exit console.
```

107

$1^2+2^2+3^2+4^2+5^2+.....+N^2$

INPUT

```c
#include<stdio.h>

int SUM_(int n)
{
    int sum =0;
     for (int i = 0; i <=n; i++)
     {
        sum = sum +i*i;
     }

     return sum;


}
int main(){
    int n;
    printf("NAME : DRISHTI JUYAL");
    printf("\nEnter n: ");
    scanf("%d",&n);
    int asd = SUM_(n);
    printf("\nsum of 1^2+2^2+3^2+4^2+.....%d^2 is %d",n,asd);


return 0;
}
```

OUTPUT

```
NAME : DRISHTI JUYAL
Enter n: 13

sum of 1^2+2^2+3^2+4^2+.....13^2 is 819

...Program finished with exit code 0
Press ENTER to exit console.
```

108

$2^2+4^2+6^2+8^2+.....+N^2$

INPUT

```c
#include<stdio.h>
int func(int n)
{
    int sum =0;
    for (int i = 2; i <=n; i=i+2)
    {
        sum = sum +i*i;
    }

    return sum;

}
int main(){
    int n;
    printf("NAME :DRISHTI JUYAL");
    printf("\nEnter n: ");
    scanf("%d",&n);
    int x;
    if ( n<=0||n%2!=0)
    {
        printf("Please enter an even number");
    }
    else
    {
        x=func(n);
        printf("The sum of 2^2+4^2+6^2+.....%d^2 is %d",n,x);

    }
return 0;
}
```

OUTPUT

```
NAME :DRISHTI JUYAL
Enter n: 56
The sum of 2^2+4^2+6^2+.....56^2 is 30856

...Program finished with exit code 0
Press ENTER to exit console.
```

109

$1^3+2^3+3^3+.....+N^3$

INPUT

```c
#include<stdio.h>

int func(int n)

{
     int sum =0;
     for (int i = 0; i <=n; i++)
     {
        sum = sum +i*i*i;
     }

     return sum;

}
int main(){
    int n;
    printf("NAME : DRISHTI JUYAL");
    printf("\nEnter n: ");
    scanf("%d",&n);
    int asd = func(n);
    printf("\nsum of 1^3+2^3+3^3+4^3+.....%d^3 is %d",n,asd);

return 0;
}
```

OUTPUT

```
NAME : DRISHTI JUYAL
Enter n: 13

sum of 1^3+2^3+3^3+4^3+.....13^3 is 8281

...Program finished with exit code 0
Press ENTER to exit console.
```

110

$1^r+2^r+3^r+4^r+.....+n^r$

INPUT

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

int main() {
    int n, r;
    printf("NAME: DRISHTI JUYAL");
    printf("Enter the value of n: ");
    scanf("%d", &n);

    printf("Enter the value of r: ");
    scanf("%d", &r);

    long sum = 0;

    for (int i = 1; i <= n; i++) {
        sum += pow(i, r);
    }

    printf("The sum of the series is: %ld\n", sum);

    return 0;
}
```

OUTPUT

```
NAME: DRISHTI JUYAL
Enter the value of n:
 12
Enter the value of r: 21
The sum of the series is: -92233720368547758O8


...Program finished with exit code 0
Press ENTER to exit console.
```