LAB FILE

INTRODUCTION TO C PROGRAMMING

BATCH 2023-2027

BCA(Hons.) AI&DS

SUBMITTED BY:

SHARDUL RATURI

2316012137

SUBMITTED TO:

Mr. Rishi Kumar

Assistant. Prof (CS/IT)

GEU

INDEX

S.NO	NAME	PG.NO	REMARKS	T.SIGN
1	THIS IS MY FIRST PROGRAM	01-01		
2	ADDITION OF TWO NUMBERS	02-02		
3	AREA OF CIRCLE	03-03		
4	DIVIDE TWO NUMBERS	04-04		
5	FIND ASCII VALUE	05-05		
6	MULTIPLY FLOATING POINT NUMBERS	06-06		
7	SWAP TWO NUMBERS USING 3RD VARIABLE	07-08		
8	SWAP TWO NUMBERS WITHOUT USING 3RD VARIABLE	09-10		
9	SWAP THREE NUMBER WITHOUT USING 3RD VARIABLE	11-12		
10	AREA OF CIRCLE	13-13		
11	AREA OF SQUARE	14-14		
12	AREA OF RIGHT ANGLED TRIANGLE	15-15		
13	AREA OF ISOSCELES TRIANGLE	16-16		
14	AREA OF TRIANGLE WITH ANY THREE SIDES	17-18		

15	**AREA AND VOLUME OF A CUBE**	**19-19**		
16	**AREA AND VOLUME OF A CUBOID**	**20-20**		
17	**FIND THE LARGEST NUMBER USING THE LOGICAL AND OPERATOR**	**21-21**		
18	**VALIDATE THE USERNAME AND PASSWORD ENTERED BY THE USER IS CORRECT OR NOT USING THE PREDEFINED USERNAME AND PASSWORD**	**22-23**		
19	**TO INPUT THE POSITIVE NUMBER FROM THE USER TO PERFORM THE LEFT SHIFT OPERATOR**	**24-24**		
20	**TO INPUT THE POSITIVE NUMBER FROM THE USER TO PERFORM THE RIGHT SHIFT OPERATOR**	**25-25**		
21	**TO PERFORM THE PRE-INCREMENT AND PRE-DECREMENT OPERATOR ON TWO INTEGER AND PRINT BOTH ORIGINAL VALUE AND UPDATE VALUE**	**26-26**		

22	**TO PERFORM THE POST-INCREMENT AND POST-DECREMENT OPERATOR ON TWO INTEGER AND PRINT BOTH ORIGINAL VALUE AND UPDATE VALUE**	**27-27**		
23	**TO CHECK WHETHER FOR AN INTEGER NUMBER THAT IT IS DIVISIBLE BY 9 OR 7 USING OR OPERATOR**	**28-28**		
24	**TO IDENTIFY GENDER IN SINGLE CHARACTER AND PRINT FULL GENDER(EX: IF INPUT IS 'M' OR 'M'-IT SHOULD PRINT "MALE"**	**29-29**		
25	**TO PRINT ALL NATURAL NUMBERS IN REVERSE (FROM N TO 1)**	**30-31**		
26	**TO PRINT ALL APLPHABET FROM A TO Z**	**31-32**		
27	**TO PRINT ALL NATURAL NUMBER FROM 1TON**	**32-33**		
28	**TO PRINT ALL EVEN NUMBER FROM 1 TO 100**	**33-34**		
29	**TO PRINT ALL ODD NUMBER BETWEEN 1 TO 100**	**34-36**		

30	**TO FIND SUM OF ALL NATURAL NUMBERS BETWEEN 1 TO N**	**36-37**		
31	**TO FIND THE SUM OF ALL EVEN NUMBER FROM 1 TO N**	**38-39**		
32	**TO FIND THE SUM OF ALL ODD NUMBER FROM 1 TO N**	**39-40**		
33	**TO PRINT MULTIPLICATION TABLE OF ANY NUMBER**	**41-42**		
34	**TO COUNT NUMBERS OF DIGIT IN A NUMBER**	**42-43**		
35	**TO FIND FIRST AND LAST DIGIT OF A NUMBER**	**43-44**		
36	**TO FIND SUM OF FIRST AND LAST DIGIT OF A NUMBER**	**45-46**		
37	**TO SWAP FIRST AND LAST DIGIT OF A NUMBER**	**46-47**		
38	**TO CALCULATE SUM OF DIGIT IN A NUMBER**	**47-48**		
39	**TO CALCULATE PRODUCT OF DIGIT OF A NUMBER**	**49-50**		
40	**TO ENTER A NUMBER AND PRINT ITS REVERSE**	**50-51**		
41	**TO CHECK WHETHER NUMBER IS PALINDROME OR NOT**	**53-54**		

42	**TO FIND ALL FACTORS OF A NUMBER**	**54-55**		
43	**TO FIND FACTORIAL OF A NUMBER**	**55-56**		
44	**TO FIND HCF OF TWO NUMBER**	**56-57**		
45	**TO FIND LCM OF TWO NUMBER**	**58-59**		
46	**TO CHECK WHETHER NUMBER IS PRIME OR NOT**	**59-60**		
47	**TO PRINT ALL PRIME NUMBER BETWEEN 1 TO N**	**61-62**		
48	**TO FIND SUM OF ALL PRIME NUMBER BETWEEN 1 TO N**	**62-63**		
49	**TO FIND ALL PRIME FACTORS OF A NUMBER**	**63-64**		
50	**TO CHECK WHETHER A NUMBER IS ARMSTRONG OR NOT**	**64-65**		
51	**TO PRINT ALL ARMSTRONG NUMBER BETWEEN 1 TO N**	**66-67**		
52	**TO CHECK WHETHER NUMBER IS PERFECT NUMBER OR NOT**	**67-68**		
53	**TO PRINT ALL PERFECT NUMBER BETWEEN 1 TO**	**69-70**		

	N			
54	**TO CHECK WHETHER NUMBER IS STRONG NUMBER OR NOT**	**70-72**		
55	**TO PRINT ALL STRONG NUMBER BETWEEN 1 TO N**	**72-74**		
56	**TO PRINT FIBONACCI SERIES UPTO N TERMS**	**74-75**		
57	**TO FIND ONE'S COMPLEMENT OF A BINARY NUMBER**	**75-77**		
58	**TO FIND TWO'S COMPLEMENT OF A BINARY NUMBER**	**77-80**		
59	**TO CONVERT BINARY NUMBER TO OCTAL NUMBER**	**80-81**		
60	**TO CONVERT BINARY NUMBER TO DECIMAL NUMBER**	**82-83**		
61		**84-87**		
62	**TO CONVERT OCTAL NUMBER TO BINARY NUMBER**	**88-89**		
63	**TO CONVERT OCTAL NUMBER TO DECIMAL NUMBER**	**89-90**		
64	**TO CONVERT OCTAL**	**91-93**		

	NUMBER TO HEXADECIMAL NUMBER			
65	**TO CONVERT DECIMAL NUMBER TO BINARY NUMBER**	**93-94**		
66	**TO FIND MAXIMUM BETWEEN TWO NUMBERS**	**95-96**		
67	**TO FIND MAXIMUM BETWEEN THREE NUMBERS**	**96-98**		
68	**TO CHECK WHETHER NUMBER IS POSITIVE NEGATIVE OR ZERO**	**98-99**		
69	**TO CHECK WHETHER NUMBER IS DIVISIBLE BY 5 AND 11 OR NOT**	**99-100**		
70	**TO CHECK WHETHER NUMBER IS EVEN OR ODD**	**101-102**		
71	**TO CHECK WHETHER A YEAR IS LEAP YEAR OR NOT**	**102-103**		
72	**TO CHECK WHETHER A CHARACTER IS ALPHABET OR NOT**	**103-104**		
73	**TO INPUT AND ALPHABET AND CHECK WHETHER IT IS VOWEL OR**	**104-106**		

	CONSONANT			
74	**TO INPUT ANY CHARACTER AND CHECK WHETHER IT IS ALPHABET DIGIT OR SPECIAL CHARACTER**	**106-107**		
75	**TO CHECK WHETHER A CHARACTER IS UPPERCASE OR LOWERCASE ALPHABET**	**107-109**		
76	**TO INPUT WEEK NUMBERS AND PRINT WEEK DAYS**	**109-111**		
77	**TO INPUT MONTH NUMBER AND PRINT NUMBER OF DAYS IN THAT MONTH**	**111-114**		
78	**TO COUNT TOTAL NUMBER OF NOTES IN GIVEN AMOUNT**	**114-117**		
79	**TO INPUT ANGLE OF A TRIANGLE AND CHECK WHETHER TRIANGLE IS VALID OR NOT**	**117-118**		
80	**TO INPUT ALL SIDES OF A TRIANGLE AND CHECK WHETHER TRIANGLE IS VALID OR NOT**	**118-120**		
81	**TO CHECK WHETHER THE TRIANGLE IS**	**120-121**		

	EQUILATERAL OR SCALE IN TRIANGLE			
82	**TO FIND ALL ROOTS OF A QUADRATIC EQUATION**	**121-123**		
83	**TO CALCULATE PROFIT AND LOSS**	**123-125**		
84	**TO INPUT MARKS OF FIVE SUBJECTS PHYSICS, CHEMISTRY, BIOLOGY, MATHEMATICS AND COMPUTER. CALCULATE PERCENTAGE AND GRADE ACCORDING TO FOLLOWING: PERCENTAGE >= 90% : GRADE A PERCENTAGE >= 80% : GRADE B PERCENTAGE >= 70% : GRADE C PERCENTAGE >= 60% : GRADE D PERCENTAGE >= 40% : GRADE E PERCENTAGE < 40% : GRADE F**	**125-127**		
85	**TO INPUT BASIC SALARY OF AN EMPLOYEE AND CALCULATE ITS GROSS SALARY ACCORDING TO FOLLOWING: BASIC SALARY <= 10000 : HRA = 20%, DA = 80% BASIC SALARY <= 20000 : HRA = 25%, DA = 90% BASIC SALARY > 20000 : HRA = 30%, DA = 95%**	**127-129**		
86	**TO INPUT ELECTRICITY UNIT CHARGES AND CALCULATE TOTAL ELECTRICITY BILL ACCORDING TO THE GIVEN CONDITION: FOR FIRST 50 UNITS RS. 0.50/UNIT FOR NEXT 100 UNITS RS. 0.75/UNIT FOR NEXT 100 UNITS RS. 1.20/UNIT FOR UNIT ABOVE 250 RS. 1.50/UNIT**	**129-131**		

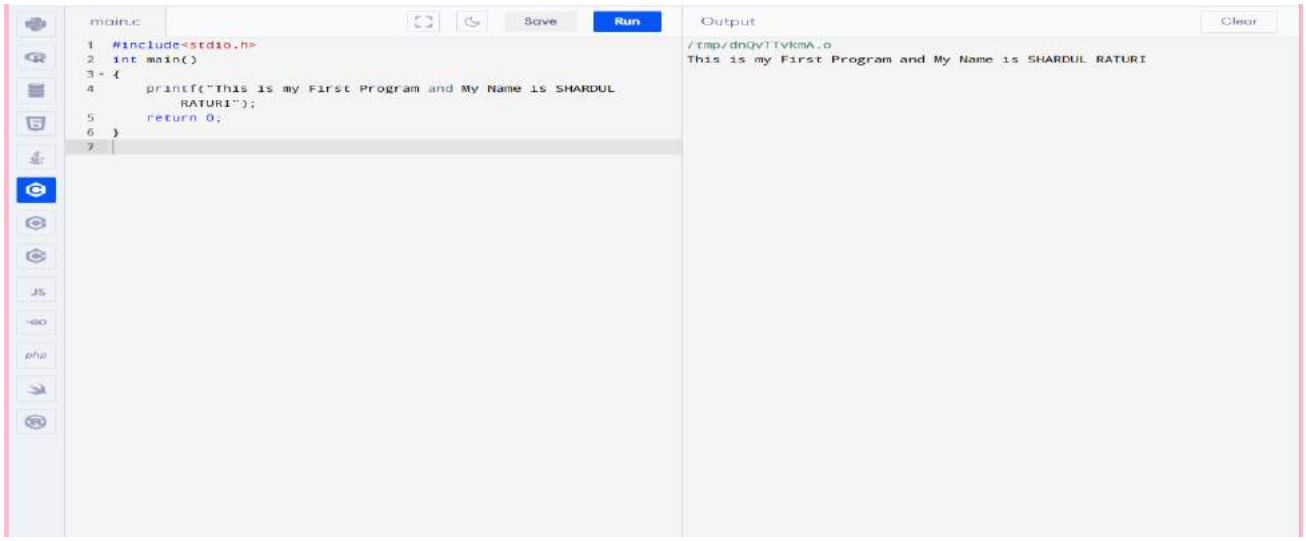
	AN ADDITIONAL SURCHARGE OF 20% IS ADDED TO THE BILL			
87	TO CONVERT SPECIFIED DAYS INTO YEARS WEEKS AND DAYS	131-132		
88	PYRAMID STAR PATTERN	133-134		
89	HOLO PYRAMID STAR PATTERN	134-135		
90	INVERTED PYRAMID STAR PATTERN	136-137		
91	HOLLOW INVERTED STAR PATTERN	137-138		
92	HALF DIAMOND STAR PATTERN	139-140		
93	MIRRORED HALF DIAMOND STAR PATTERN	140-142		
94	NUMBER PATTERN 1	142-143		
95	NUMBER PATTERN 2	143-145		
96	NUMBER PATTERN 3	145-147		
97	NUMBER PATTERN 4	147-149		
98	NUMBER PATTERN 5	149-151		
99	NUMBER PATTERN 6	151-153		
100	TO READ N NUMBERS OF VALUES IN AN ARRAY AND DISPLAY THEM IN REVERSE ORDER	153-154		
101	TO FIND THE SUM OF ALL ELEMENTS OF THE ARRAY	155-156		
102	TO COPY THE ELEMENTS OF ONE ARRAY INTO	156-157		

	ANOTHER ARRAY			
103	TO COUNT THE TOTAL NUMBERS OF DUPLICATE ELEMENTS IN AN ARRAY	157-159		
104	TO FIND THE MAXIMUM AND MINIMUM ELEMENTS IN AN ARRAY	159-161		
105	TO SORT THE ELEMENTS OF AN ARRAY IN DESCENDING ORDER	161-162		
106	TO SEPARATE ODD AND EVEN INTEGERS INTO SEPARATE ARRAY	162-164		
107	TO MERGE TWO ARRAYS OF THE SAME SIZE SORTED IN ASCENDING ORDER	164-166		
108	TO MERGE TWO ARRAYS OF THE SAME SIZE SORTED IN DESCENDING ORDER	167-169		
109	READ MATRIX ELEMENT AND DISPLAY	169-171		
110	MATRIX MULTIPLICATION AND DISPLAY	172-174		
111	ADDITION OF MATRIX AND DISPLAY	175-178		
112	SUBTRACTION OF MATRIX AND DISPLAY	179-182		
113	TRANSPOSE OF MATRIX	183-186		

	AND DISPLAY			

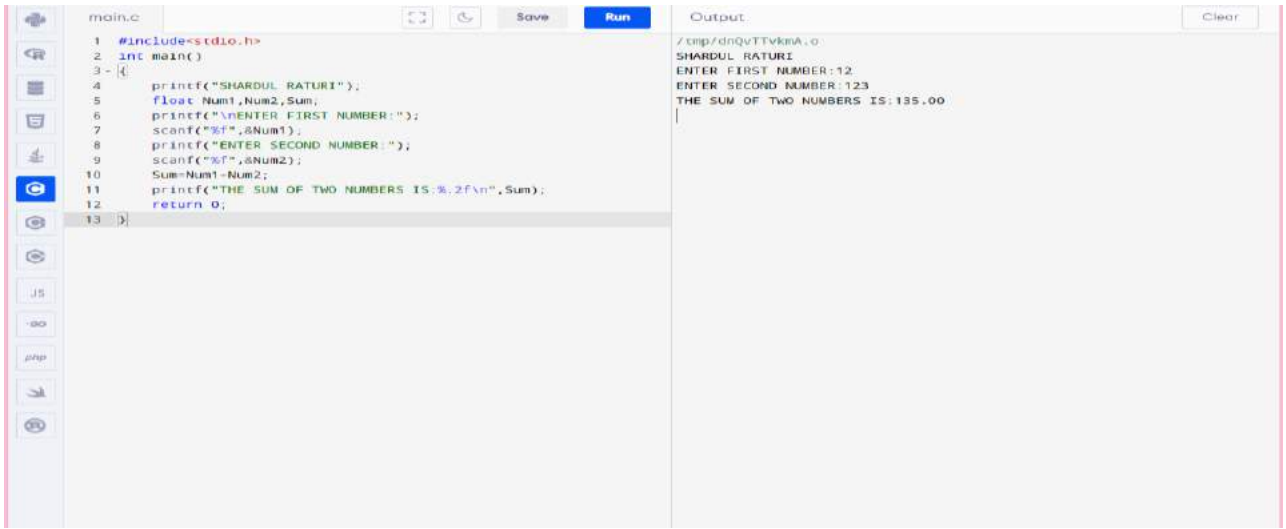
❖ PROGRAM 1:- THIS IS MY FIRST PROGRAM

```
#include<stdio.h>

int main()

{

        printf("This is my First Program and My Name is SHARDUL RATURI");

        return 0;

}
```



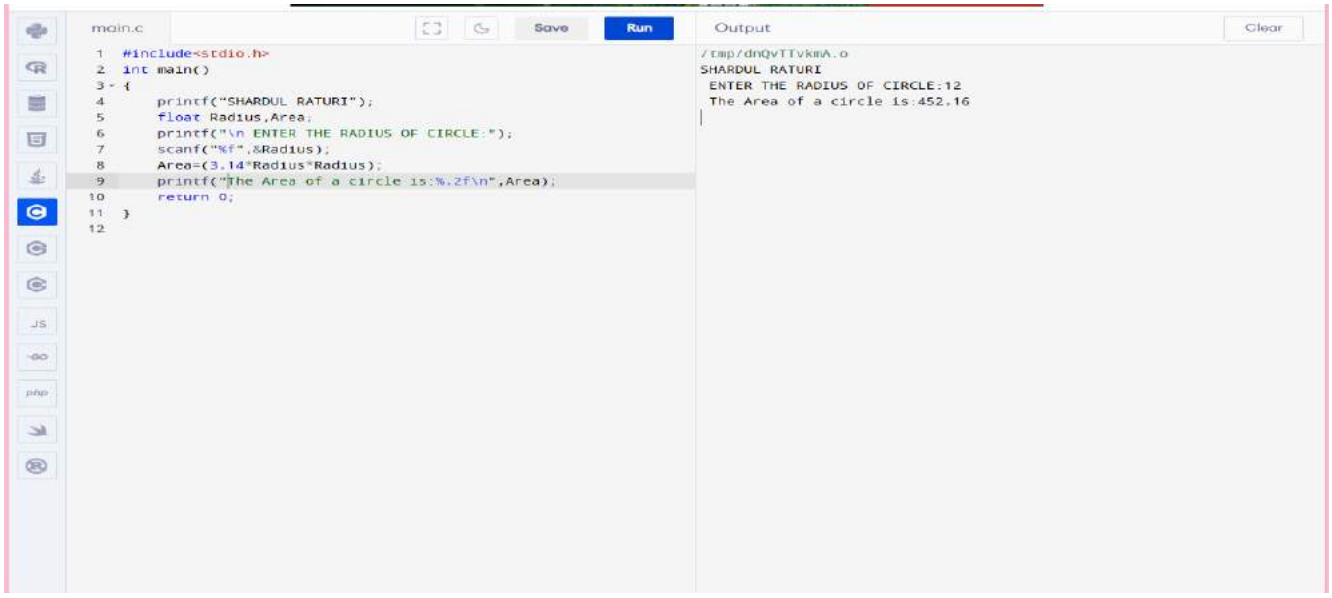
❖ PROGRAM 2:- TO ADD TWO NUMBERS

```
#include<stdio.h>
int main()
{
   printf("SHARDUL RATURI");
   float Num1,Num2,Sum;
   printf("\nENTER FIRST NUMBER:");
   scanf("%f",&Num1);
   printf("ENTER SECOND NUMBER:");
   scanf("%f",&Num2);
   Sum=Num1+Num2;
   printf("THE SUM OF TWO NUMBERS IS:%.2f\n",Sum);
   return 0;
}
```



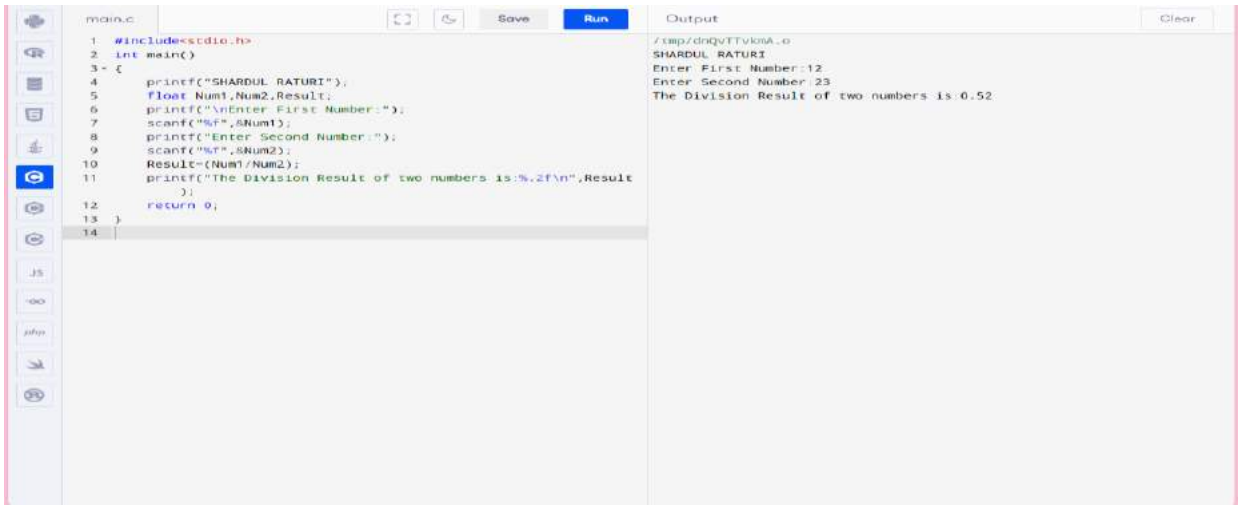
❖ PROGRAM 3:- TO FIND AREA OF CIRCLE

```
#include<stdio.h>

int main()

{

        printf(“SHARDUL RATURI”);

        float Radius,Area,;

        printf(“\nEnter Radius of a circle:”);

        scanf(“%f”,&Radius);

        Area=(3.14*Radius*Radius;

        printf(“The Area of a circle is:%.2f\n”,Area);

        return 0;

}
```



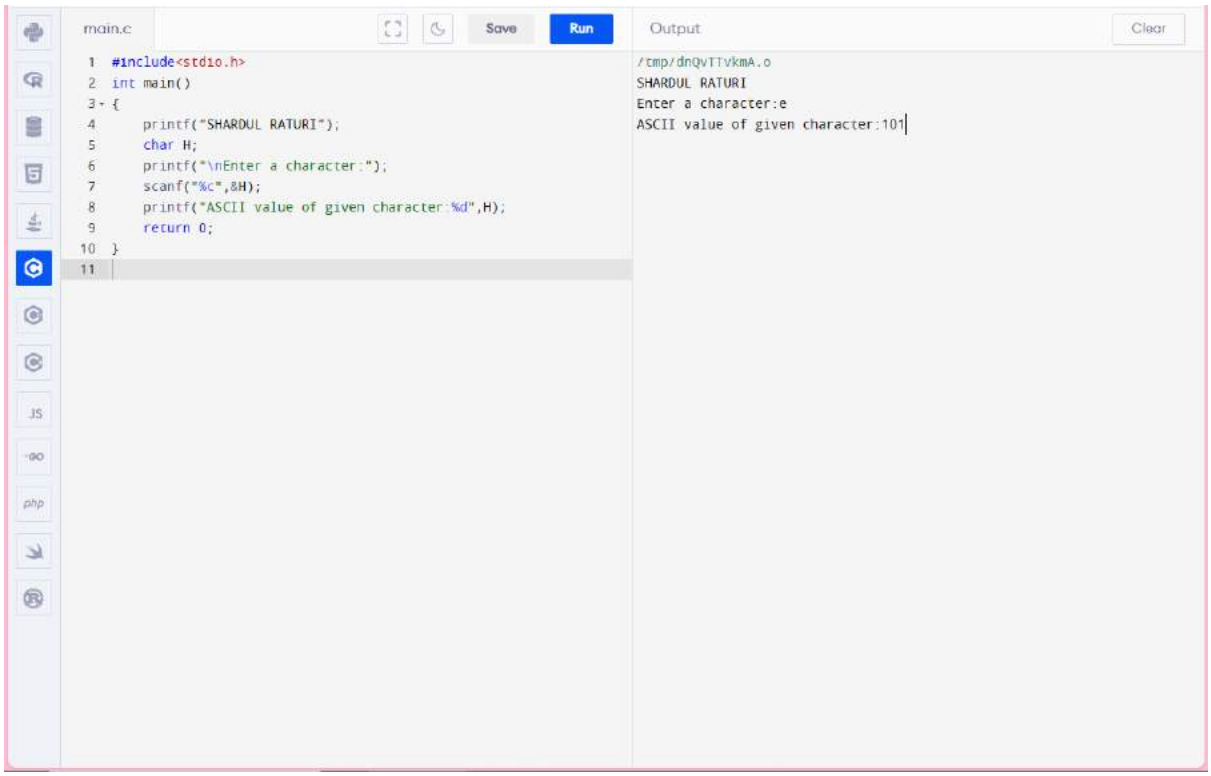
❖ PROGRAM 4:- TO DIVIDE TWO NUMBERS

```
#include<stdio.h>
int main()
{
        printf(“SHARDUL RATURI”);
        float Num1,Num2,Result;
        printf("\nEnter First Number:");
        scanf("%f",&Num1);
        printf("Enter Second Number:");
        scanf("%f",&Num2);
        Result=(Num1/Num2);
        printf("The Division Result of two numbers is:%.2f\n",Result);
        return 0;
}
```



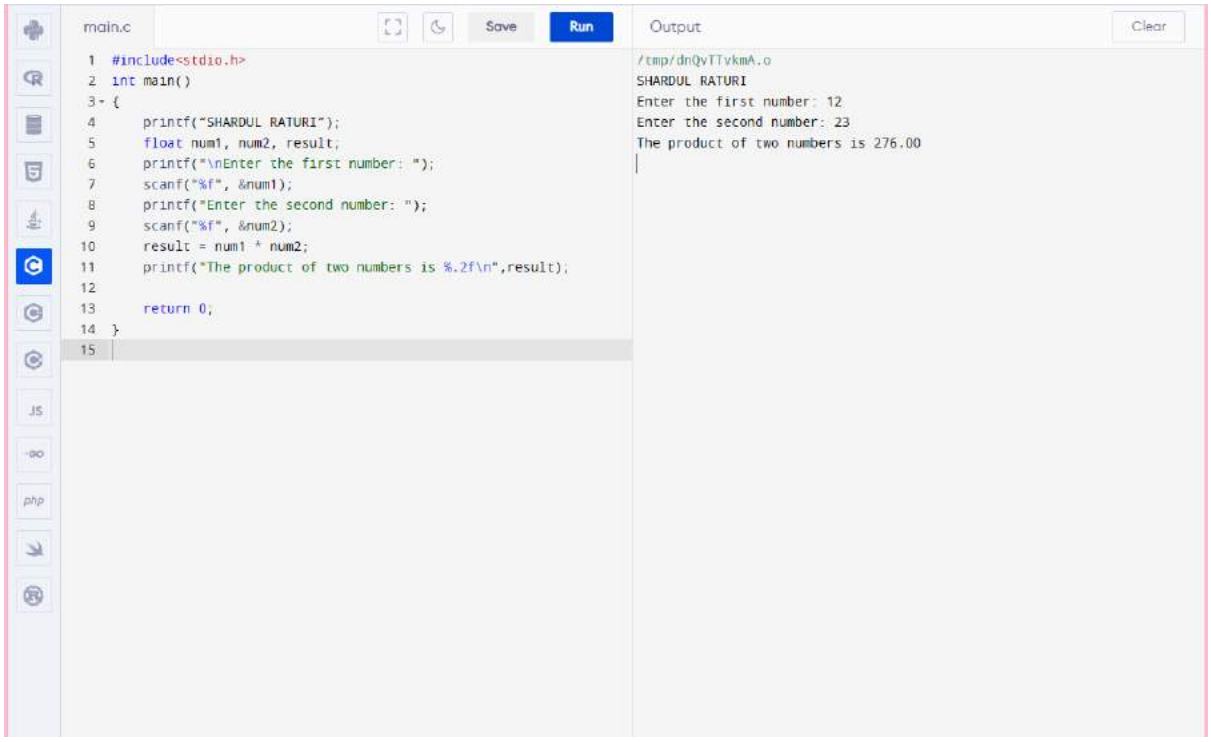
❖ PROGRAM 5:- TO PRINT ASCII VALUE

```
#include<stdio.h>
int main()
{
   printf(“SHARDUL RATURI”);
   char H;
   printf("\nEnter a character:");
   scanf("%c",&H);
   printf("ASCII value of given character:%d",H);
   return 0;
}
```



❖ PROGRAM 6:- TO MULTIPLY FLOATING NUMBERS

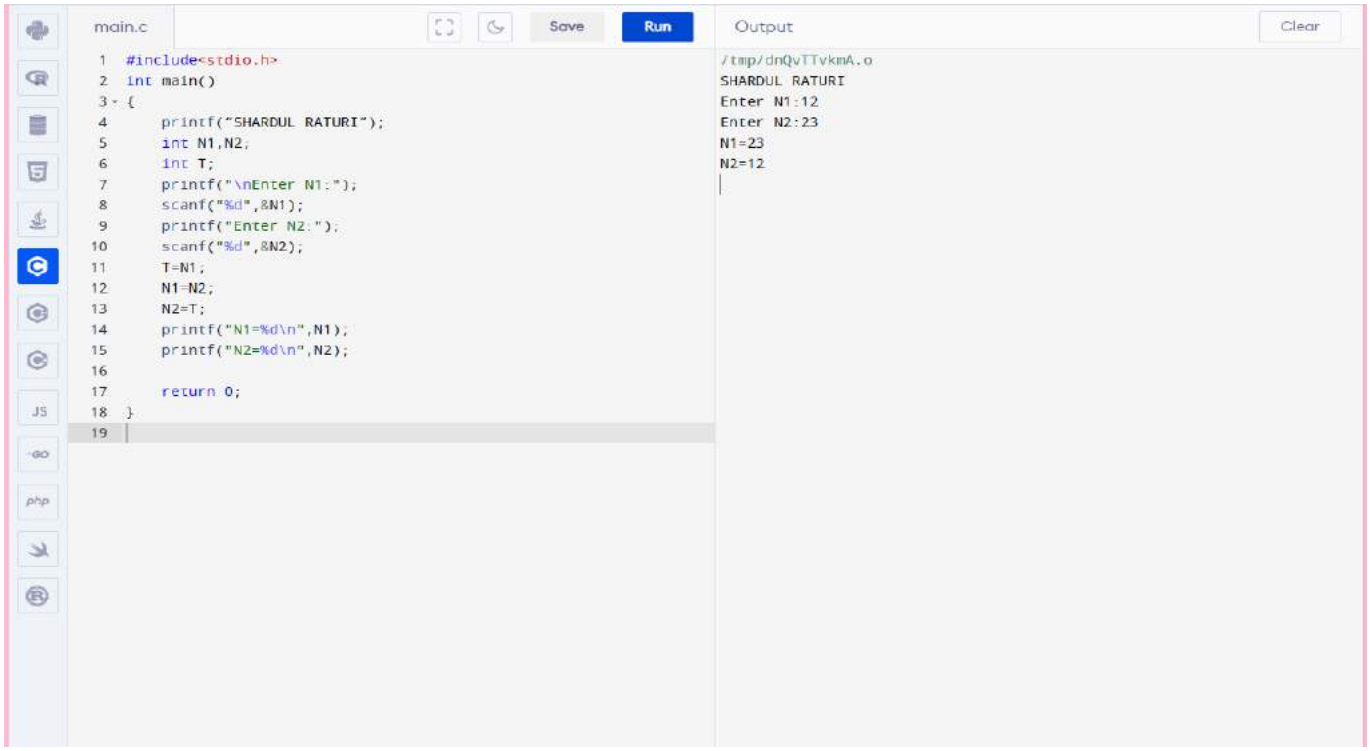
```
#include<stdio.h>
int main()
{
   printf(“SHARDUL RATURI”);
   float num1, num2, result;
   printf("\nEnter the first number: ");
   scanf("%f", &num1);
   printf("Enter the second number: ");
   scanf("%f", &num2);
   result = num1 * num2;
   printf("The product of two numbers is %.2f\n",result);

   return 0;
}
```



❖ PROGRAM 7:- TO SWAP TWO NUMBERS BY USING 3rd VARIABLE

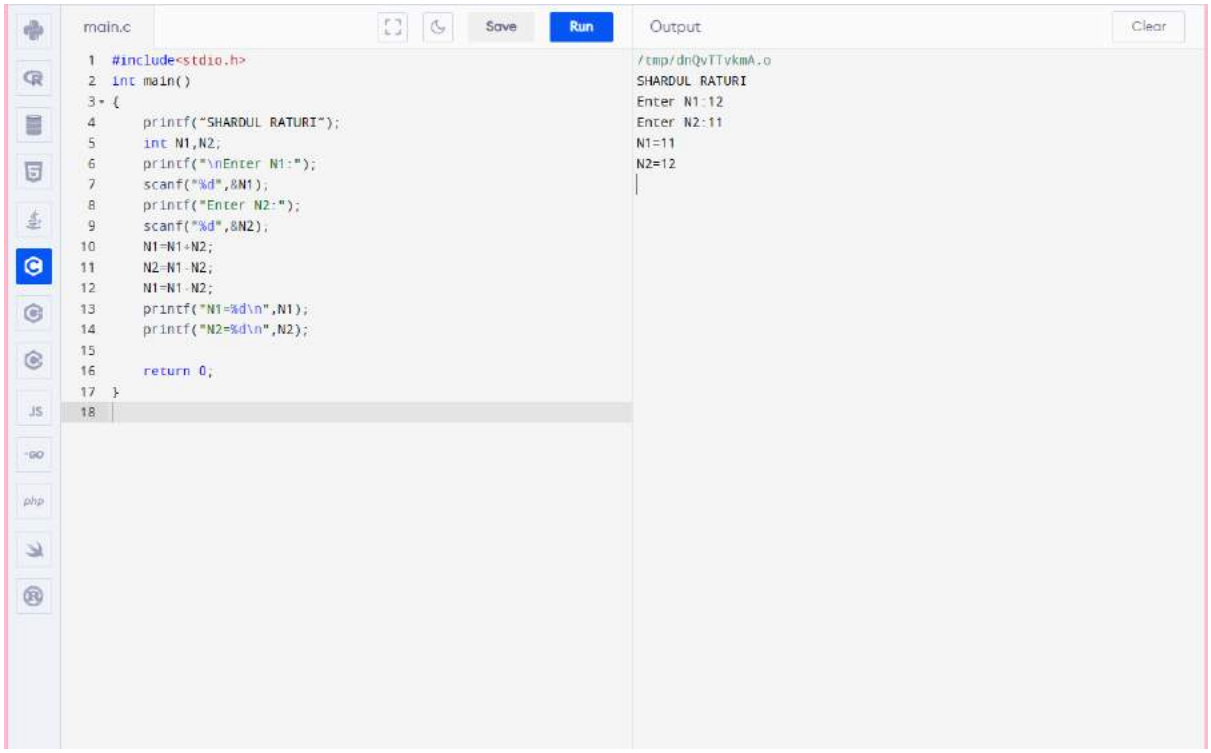
```
#include<stdio.h>
int main()
{
   printf(“SHARDUL RATURI”);
   int N1,N2;
   int T;
   printf("\nEnter N1:");
   scanf("%d",&N1);
   printf("Enter N2:");
   scanf("%d",&N2);
   T=N1;
```

```
    N1=N2;
    N2=T;
    printf("N1=%d\n",N1);
    printf("N2=%d\n",N2);

    return 0;
}
```



❖ PROGRAM 8:- TO SWAP TWO VARIABLES WITHOUT USING 3rd VARIABLE

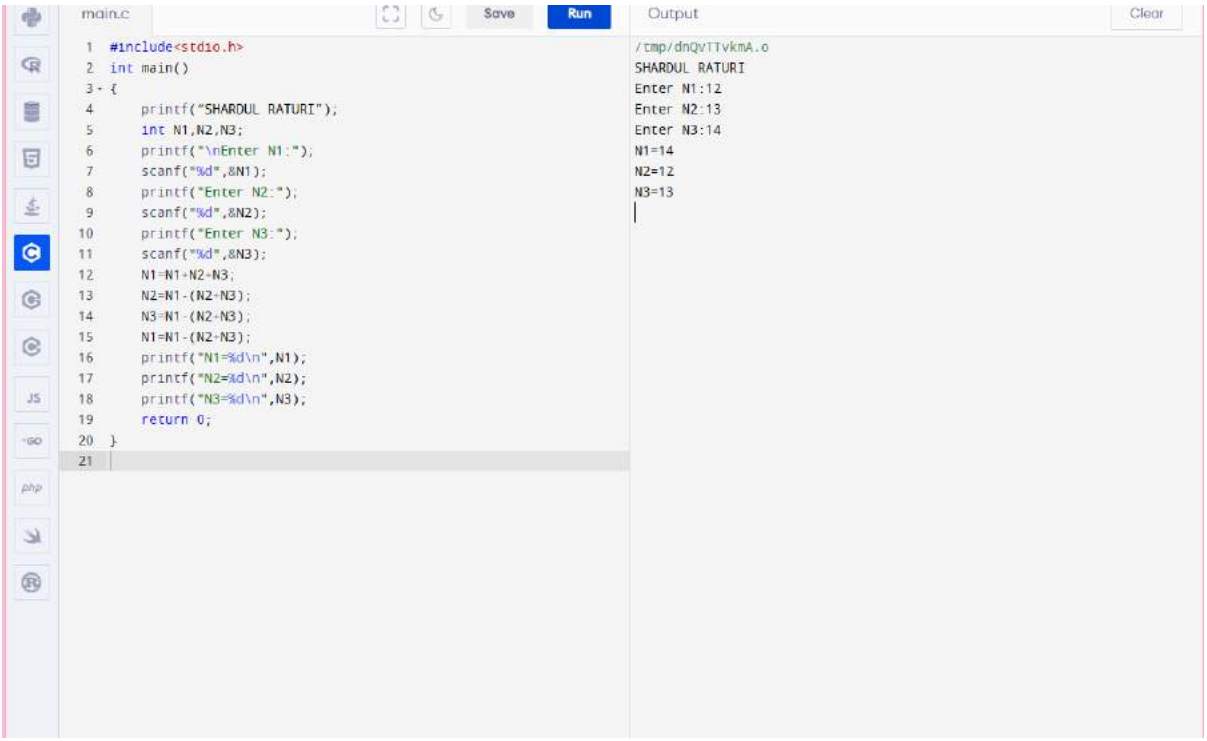
```
#include<stdio.h>
int main()
{
   printf(“SHARDUL RATURI”);
   int N1,N2;
   printf("\nEnter N1:");
   scanf("%d",&N1);
   printf("Enter N2:");
   scanf("%d",&N2);
   N1=N1+N2;
   N2=N1-N2;
   N1=N1-N2;
   printf("N1=%d\n",N1);
   printf("N2=%d\n",N2);

   return 0;
}
```



❖ PROGRAM 9:- TO SWAP THREE VARIABLES WITHOUT USING 3rd VARIABLE

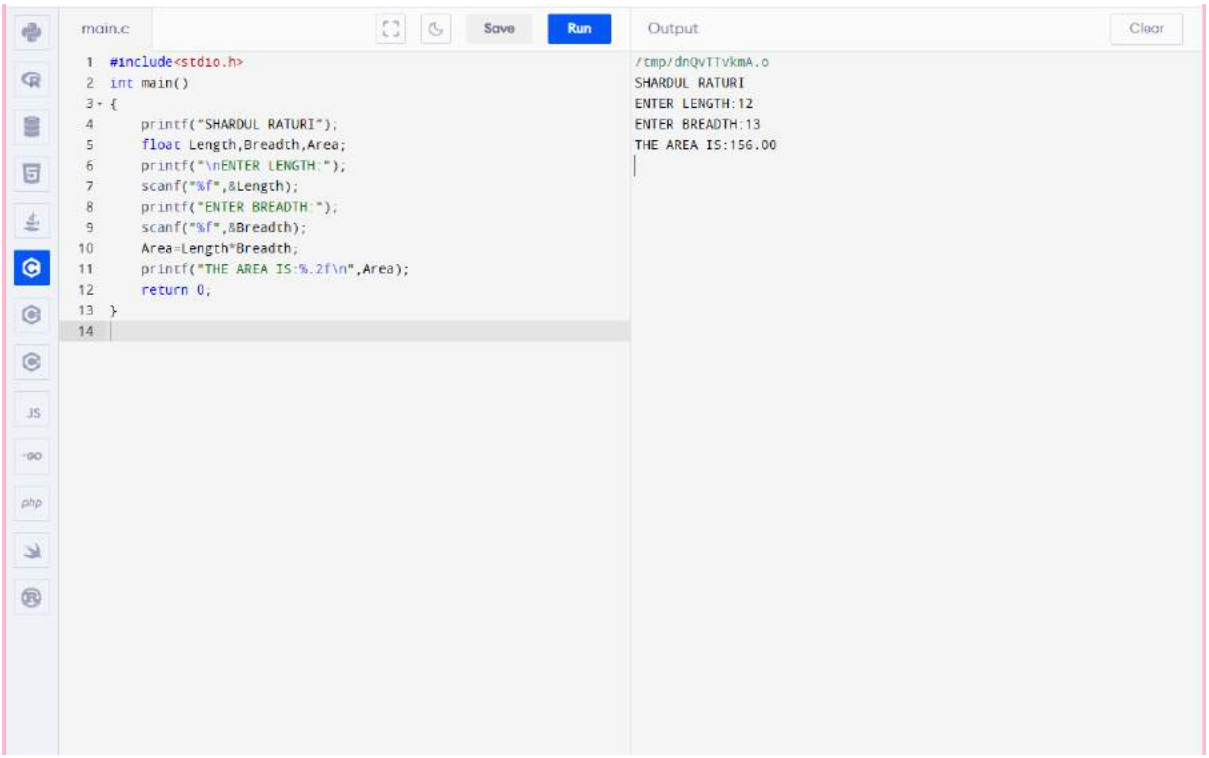
```
#include<stdio.h>
int main()
{
   printf(“SHARDUL RATURI”);
   int N1,N2,N3;
   printf("\nEnter N1:");
   scanf("%d",&N1);
   printf("Enter N2:");
   scanf("%d",&N2);
```

```
    printf("Enter N3:");
    scanf("%d",&N3);
    N1=N1+N2+N3;
    N2=N1-(N2+N3);
    N3=N1-(N2+N3);
    N1=N1-(N2+N3);
    printf("N1=%d\n",N1);
    printf("N2=%d\n",N2);
    printf("N3=%d\n",N3);
    return 0;
}
```



❖ PROGRAM 10:- TO FIND AREA OF RECTANGLE

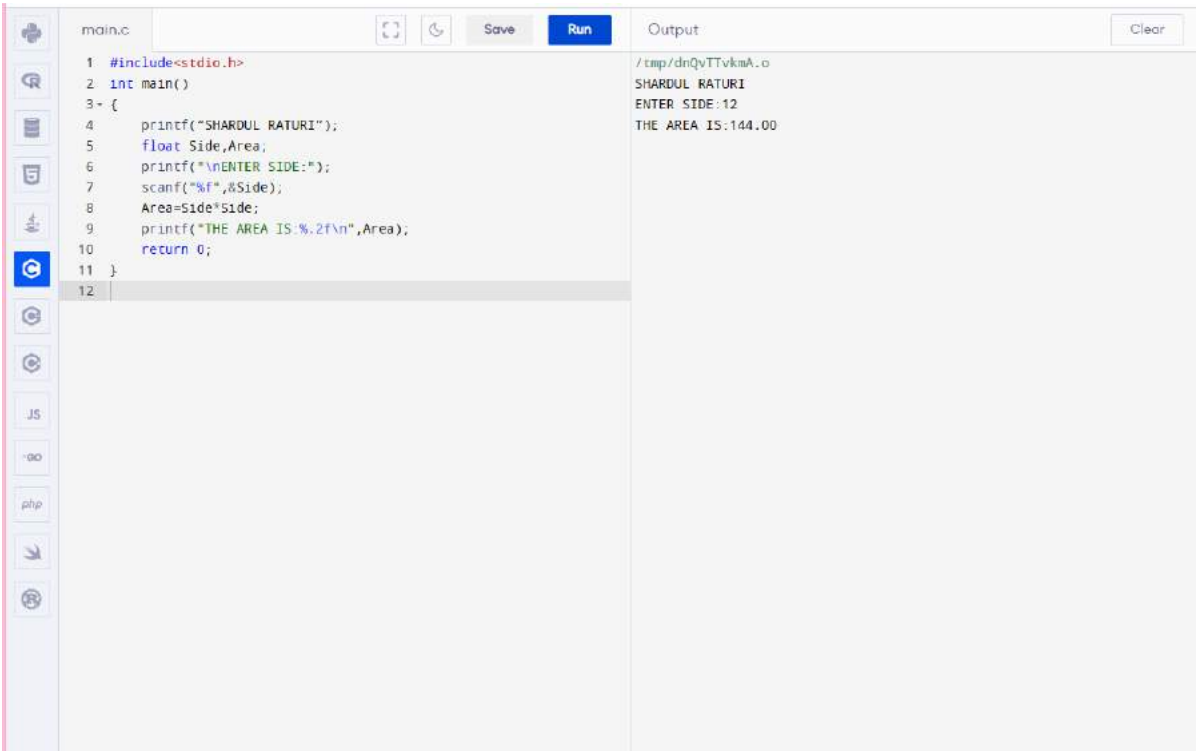
```
#include<stdio.h>
int main()
{
   printf(“SHARDUL RATURI”);
   float Length,Breadth,Area;
   printf("\nENTER LENGTH:");
   scanf("%f",&Length);
   printf("ENTER BREADTH:");
   scanf("%f",&Breadth);
   Area=Length*Breadth;
   printf("THE AREA IS:%.2f\n",Area);
   return 0;
}
```



❖ PROGRAM 11:- TO FIND AREA OF SQUARE

```
#include<stdio.h>
int main()
{
   Printf(“SHARDUL RATURI”);
   float Side,Area;
   printf("\nENTER SIDE:");
   scanf("%f",&Side);
   Area=Side*Side;
   printf("THE AREA IS:%.2f\n",Area);
   return 0;
```

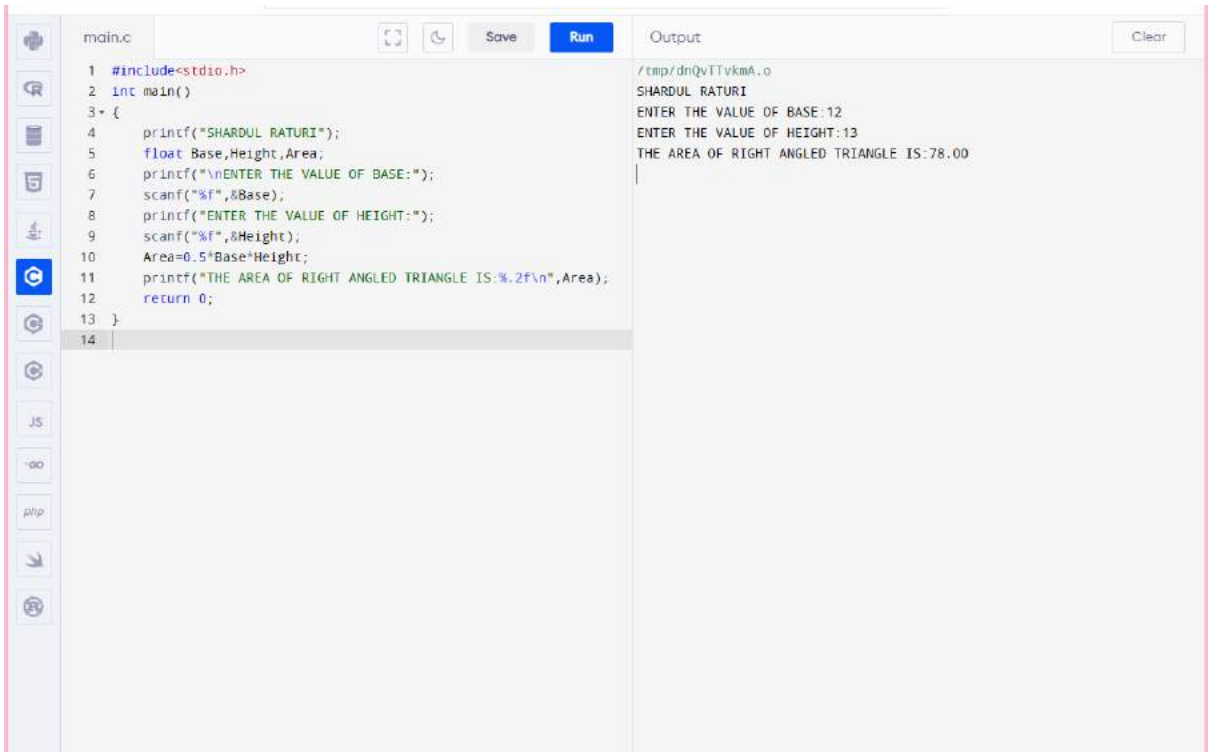
}



❖ PROGRAM 12:- TO FIND AREA OF RIGHT ANGLED TRIANGLE

```
#include<stdio.h>
int main()
{
   printf("SHARDUL RATURI");
   float Base,Height,Area;
   printf("\nENTER THE VALUE OF BASE:");
   scanf("%f",&Base);
   printf("ENTER THE VALUE OF HEIGHT:");
   scanf("%f",&Height);
```

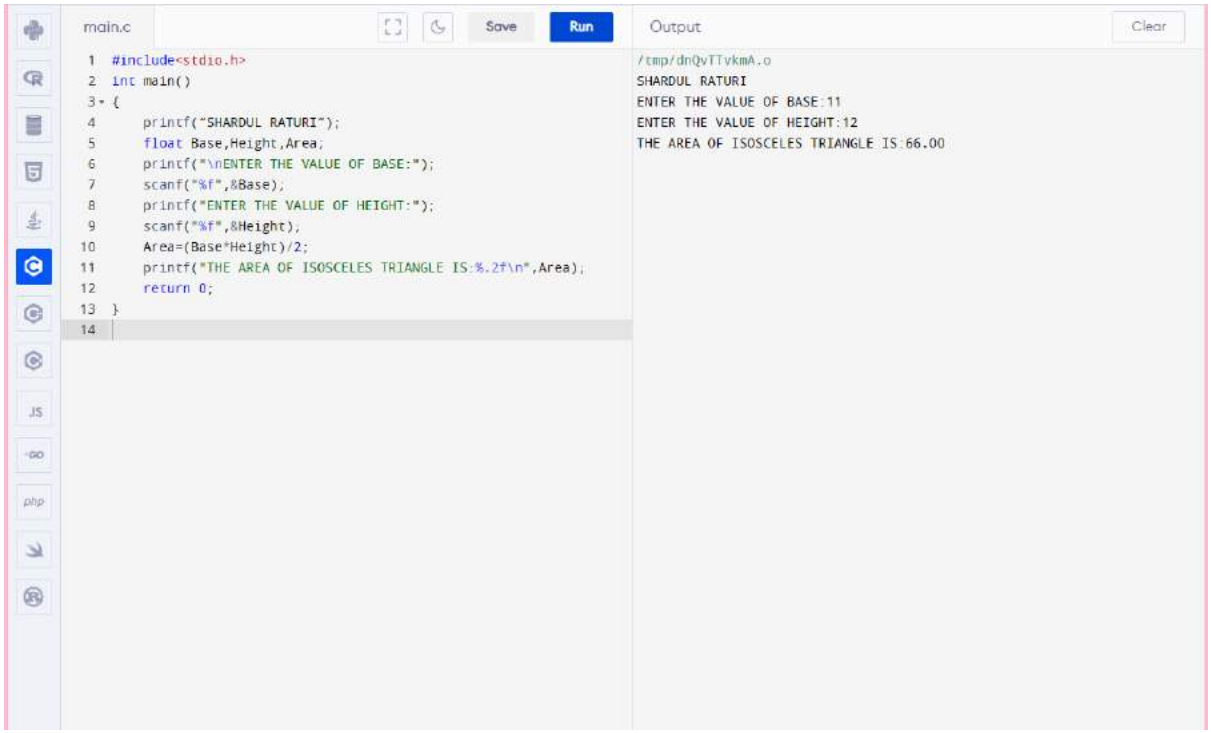
```
    Area=0.5*Base*Height;
    printf("THE AREA OF RIGHT ANGLED TRIANGLE IS:%.2f\n",Area);
    return 0;
}
```



❖ PROGRAM 13:- TO FIND AREA OF ISOSCLES TRIANGLE

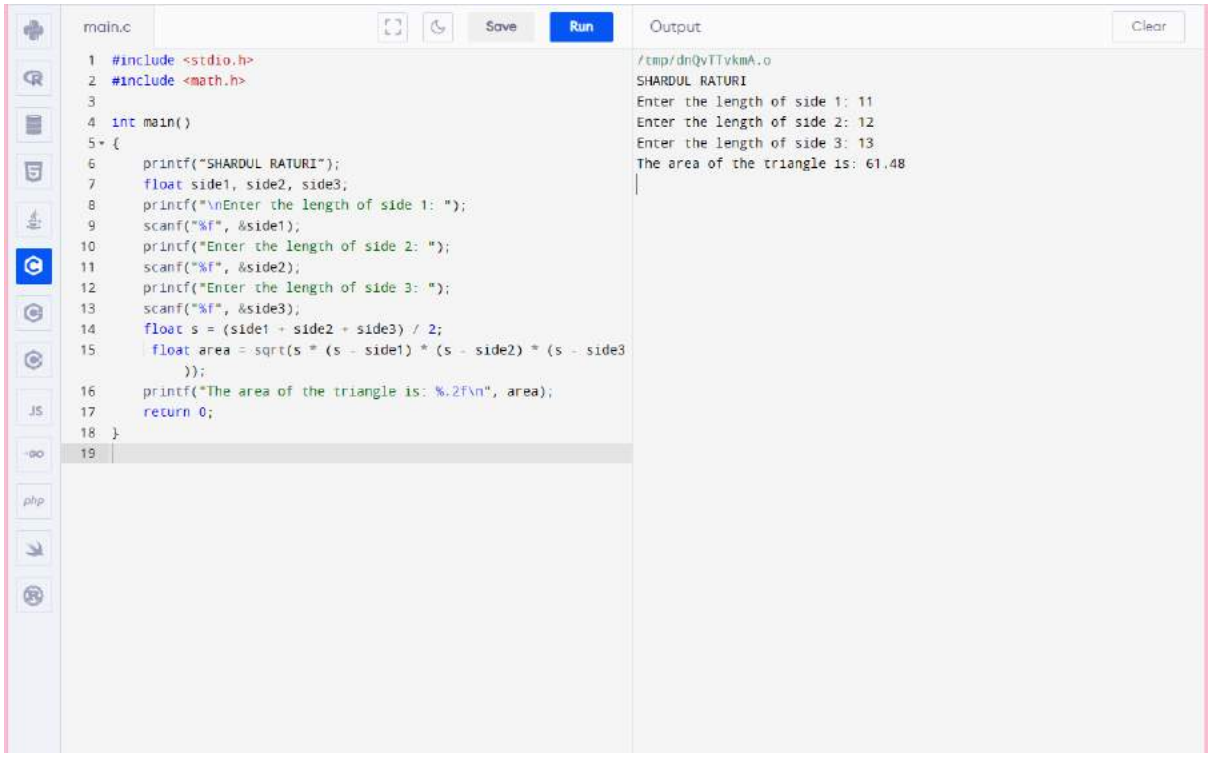
```
#include<stdio.h>
int main()
{
    printf(“SHARDUL RATURI”);
```

```
    float Base,Height,Area;
    printf("\nENTER THE VALUE OF BASE:");
    scanf("%f",&Base);
    printf("ENTER THE VALUE OF HEIGHT:");
    scanf("%f",&Height);
    Area=(Base*Height)/2;
    printf("THE AREA OF ISOSCELES TRIANGLE IS:%.2f\n",Area);
    return 0;
}
```



❖ PROGRAM 14:- TO FIND AREA OF TRIANGLE WITH ANY THREE SIDES

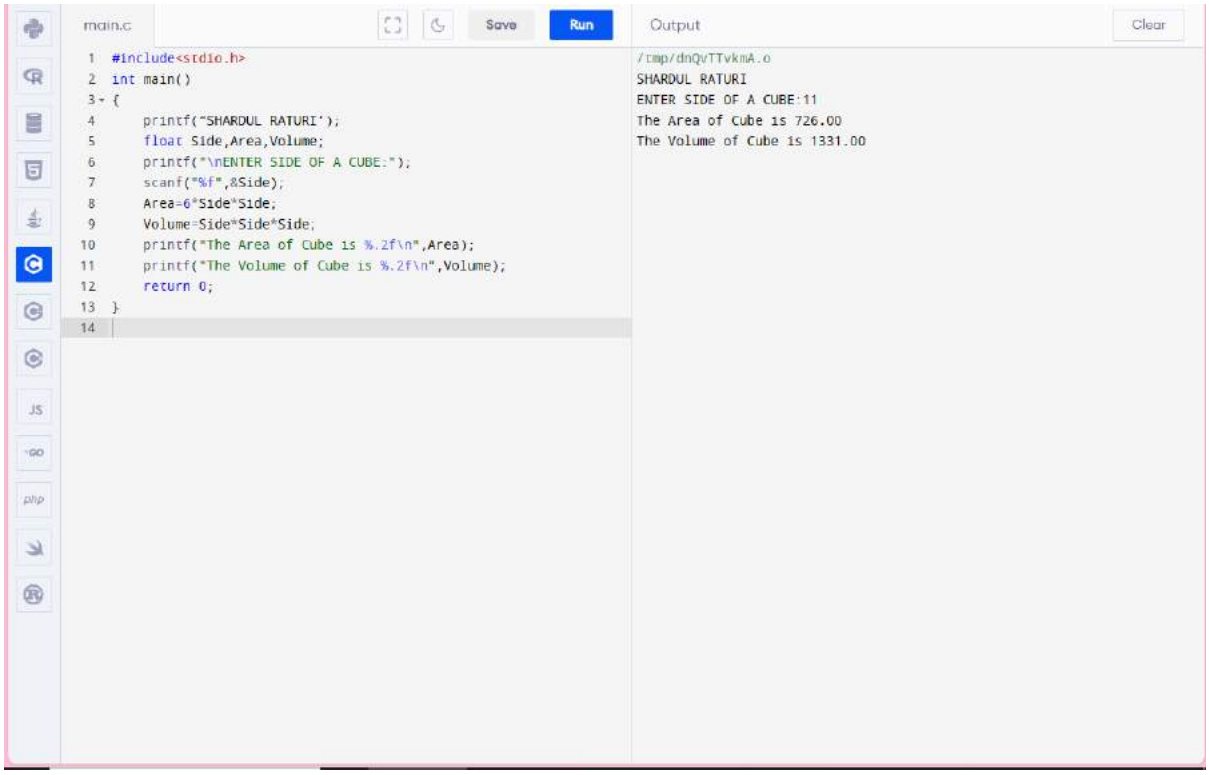
```
#include <stdio.h>
#include <math.h>

int main()
{
   printf(“SHARDUL RATURI”);
   float side1, side2, side3;
   printf("\nEnter the length of side 1: ");
   scanf("%f", &side1);
   printf("Enter the length of side 2: ");
   scanf("%f", &side2);
   printf("Enter the length of side 3: ");
   scanf("%f", &side3);
   float s = (side1 + side2 + side3) / 2;
    float area = sqrt(s * (s - side1) * (s - side2) * (s - side3));
   printf("The area of the triangle is: %.2f\n", area);
   return 0;
}
```



PROGRAM 15:- TO FIND AREA AND VOLUME OF CUBE

```
#include<stdio.h>

int main()

{

   printf(“SHARDUL RATURI’);

   float Side,Area,Volume;

   printf("\nENTER SIDE OF A CUBE:");

   scanf("%f",&Side);

   Area=6*Side*Side;

   Volume=Side*Side*Side;
```

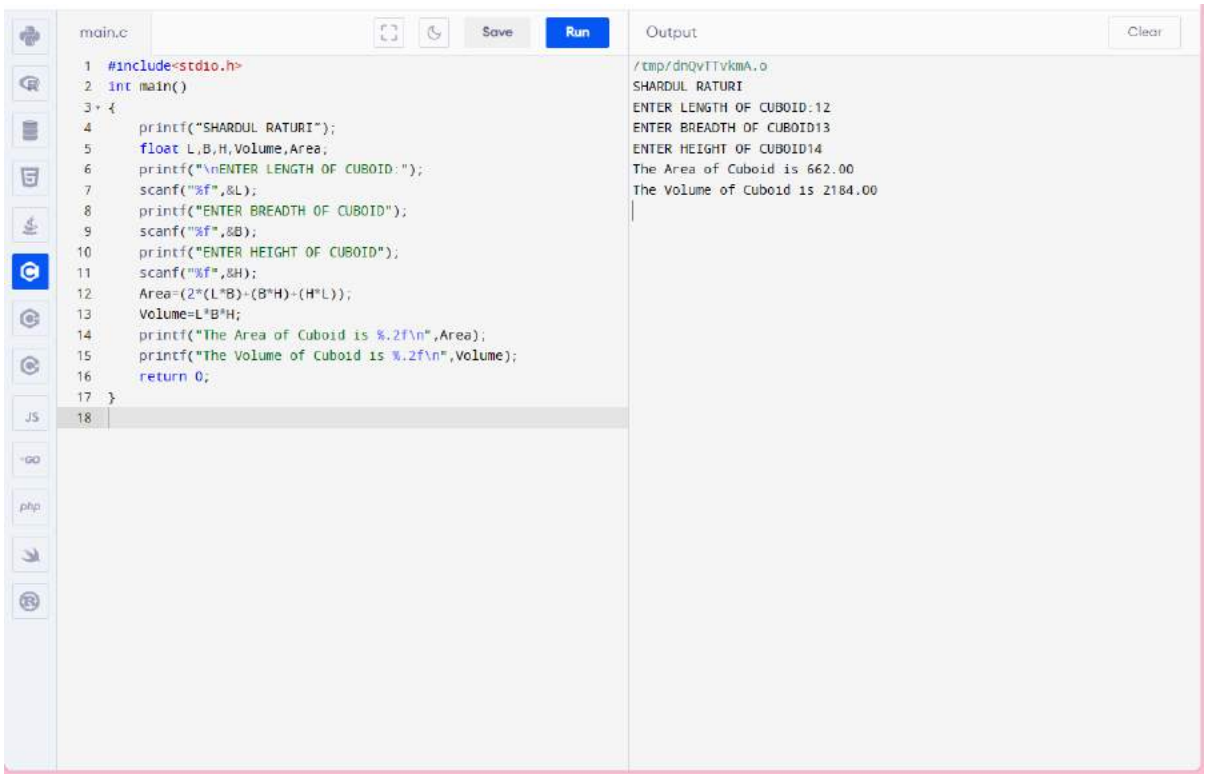
```
    printf("The Area of Cube is %.2f\n",Area);
    printf("The Volume of Cube is %.2f\n",Volume);
    return 0;
}
```



❖ PROGRAM 16: -TO FIND AREA AND VOLUME OF CUBOID

```
#include<stdio.h>
int main()
{
```

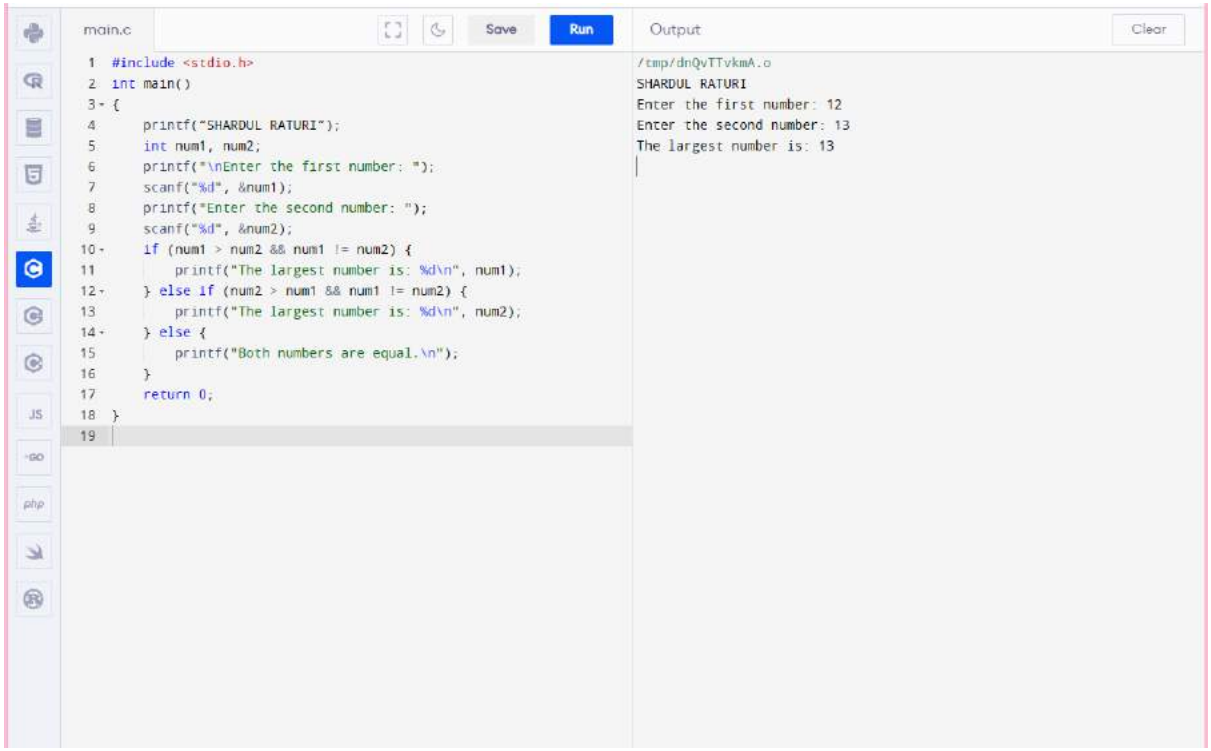
```
    printf(“SHARDUL RATURI”);
    float L,B,H,Volume,Area;
    printf("\nENTER LENGTH OF CUBOID:");
    scanf("%f",&L);
    printf("ENTER BREADTH OF CUBOID");
    scanf("%f",&B);
    printf("ENTER HEIGHT OF CUBOID");
    scanf("%f",&H);
    Area=(2*(L*B)+(B*H)+(H*L));
    Volume=L*B*H;
    printf("The Area of Cuboid is %.2f\n",Area);
    printf("The Volume of Cuboid is %.2f\n",Volume);
    return 0;
}
```



❖ PROGRAM 17: - TO FIND LARGEST NUMBER USING LOGICAL AND OPERATOR

```
#include <stdio.h>
int main()
{
   printf(“SHARDUL RATURI”);
   int num1, num2;
   printf("\nEnter the first number: ");
   scanf("%d", &num1);
   printf("Enter the second number: ");
```

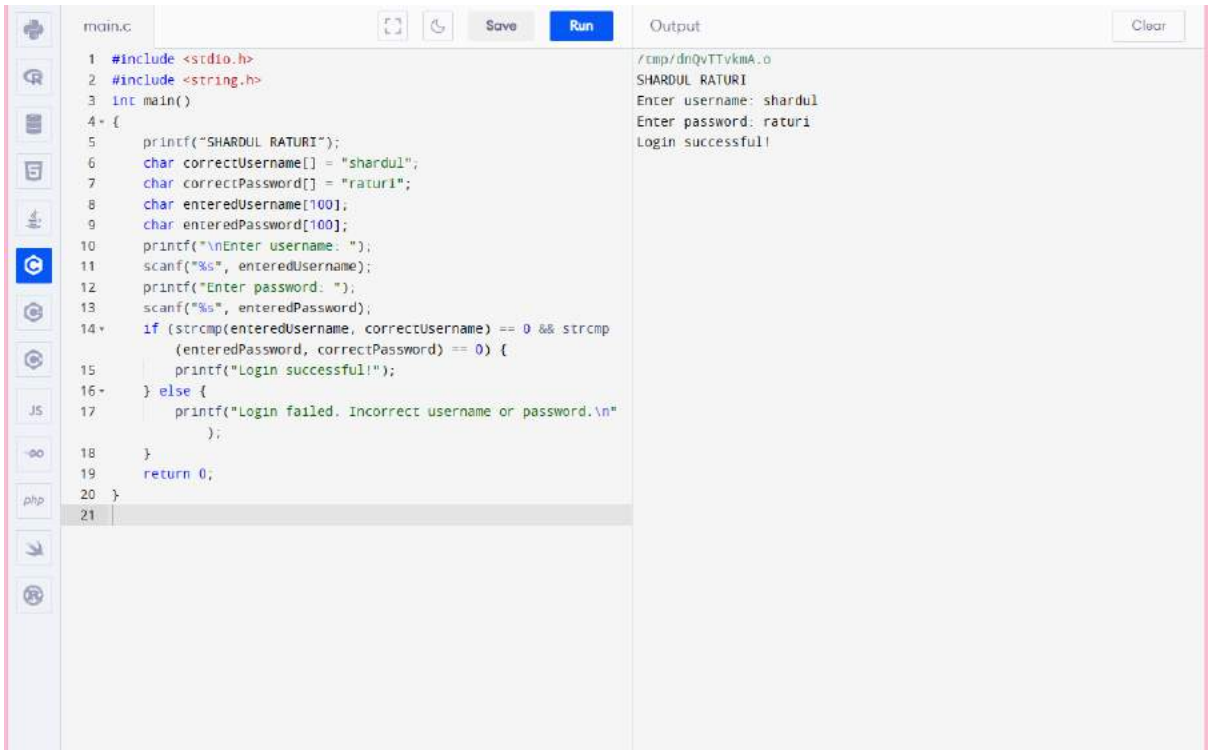
```
    scanf("%d", &num2);
    if (num1 > num2 && num1 != num2) {
        printf("The largest number is: %d\n", num1);
    } else if (num2 > num1 && num1 != num2) {
        printf("The largest number is: %d\n", num2);
    } else {
        printf("Both numbers are equal.\n");
    }
    return 0;
}
```



❖ PROGRAM 18: - TO VALIDATE THE USERNAME AND PASSWORD ENTERED BY USER IS CORRECT OR NOT USING THE PREDEFINED USERNAME AND PASSWORD

```
#include <stdio.h>
#include <string.h>
int main()
{
   printf(“SHARDUL RATURI”);
   char correctUsername[] = "HIMANSHUMAWDI";
   char correctPassword[] = "MAWDIHIMANSHU";
   char enteredUsername[100];
   char enteredPassword[100];
   printf("\nEnter username: ");
   scanf("%s", enteredUsername);
   printf("Enter password: ");
   scanf("%s", enteredPassword);
   if (strcmp(enteredUsername, correctUsername) == 0 &&
strcmp(enteredPassword, correctPassword) == 0) {
      printf("Login successful!");
   } else {
```

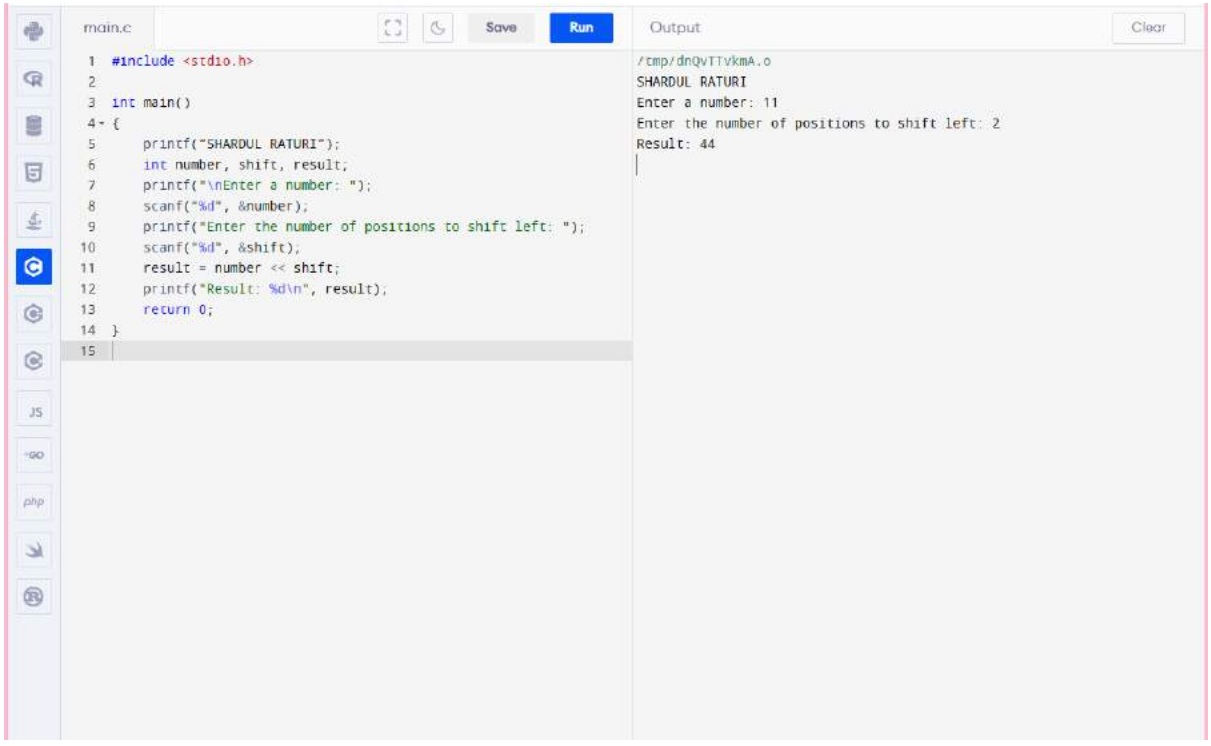
```
        printf("Login failed. Incorrect username or password.\n");
    }
    return 0;
}
```



❖ PROGRAM 19: - TO INPUT A POSITIVE NUMBER FROM THE USER AND PERFORM THE LEFT SHIFT OPERATOR

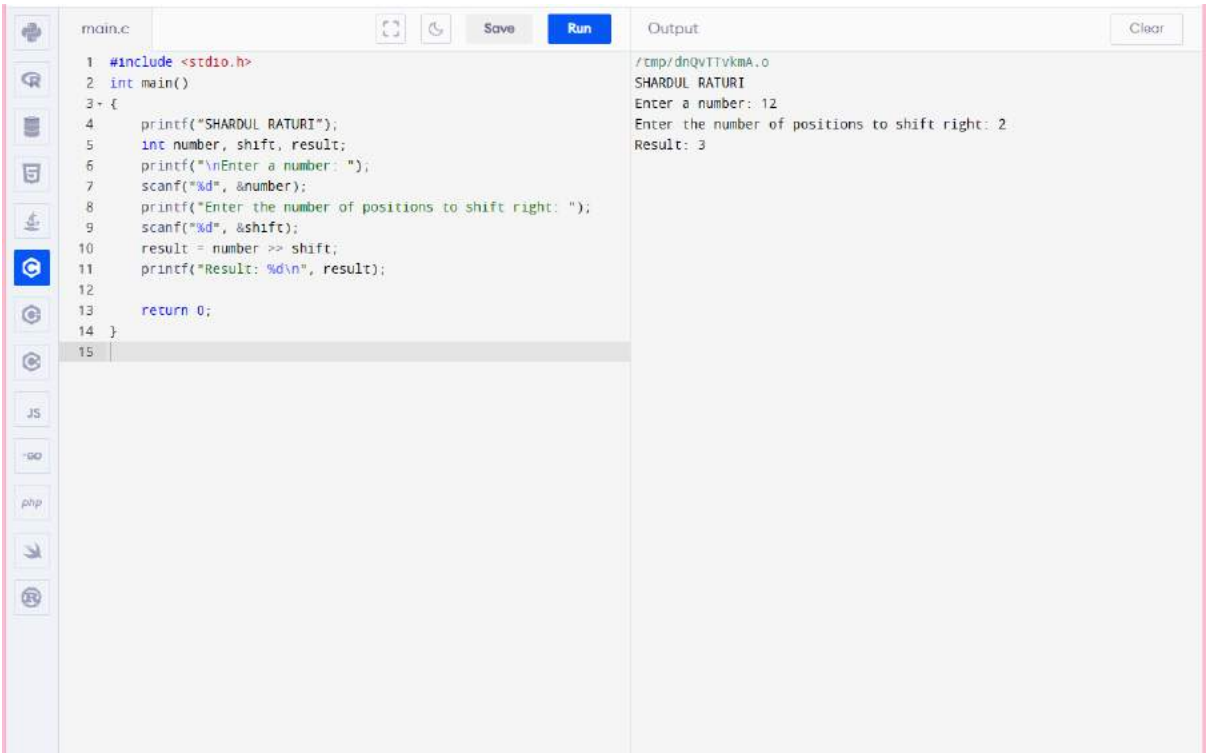
```
#include <stdio.h>


int main()
{
```

```
    printf(“SHARDUL RATURI”);
    int number, shift, result;
    printf("\nEnter a number: ");
    scanf("%d", &number);
    printf("Enter the number of positions to shift left: ");
    scanf("%d", &shift);
    result = number << shift;
    printf("Result: %d\n", result);
    return 0;
}
```



❖ PROGRAM 20: - TO INPUT THE POSITIVE NUMBER FROM THE USER TO PERFORM THE RIGHT SHIFT OPERATOR

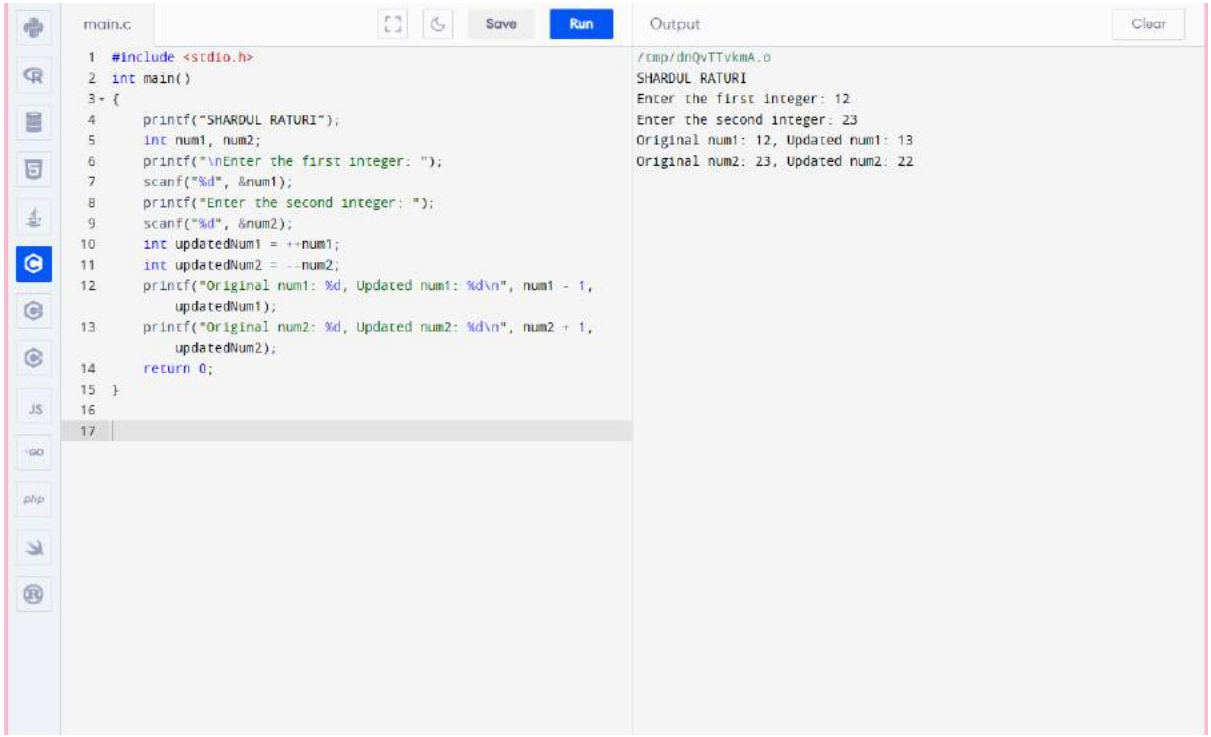
```
#include <stdio.h>
int main()
{
   printf(“SHARDUL RATURI”);
   int number, shift, result;
   printf("\nEnter a number: ");
   scanf("%d", &number);
   printf("Enter the number of positions to shift right: ");
   scanf("%d", &shift);
   result = number >> shift;
   printf("Result: %d\n", result);

   return 0;
}
```



❖ PROGRAM 21: - TO PERFORM THE PRE-INCREMENT AND PRE-DECREMENT OPERATOR ON TWO INTEGER AND PRINT BOTH ORIGINAL VALUE AND UPDATE VALUE

```
#include <stdio.h>
int main()
{
   printf(“SHARDUL RATURI”);
   int num1, num2;
   printf("\nEnter the first integer: ");
```

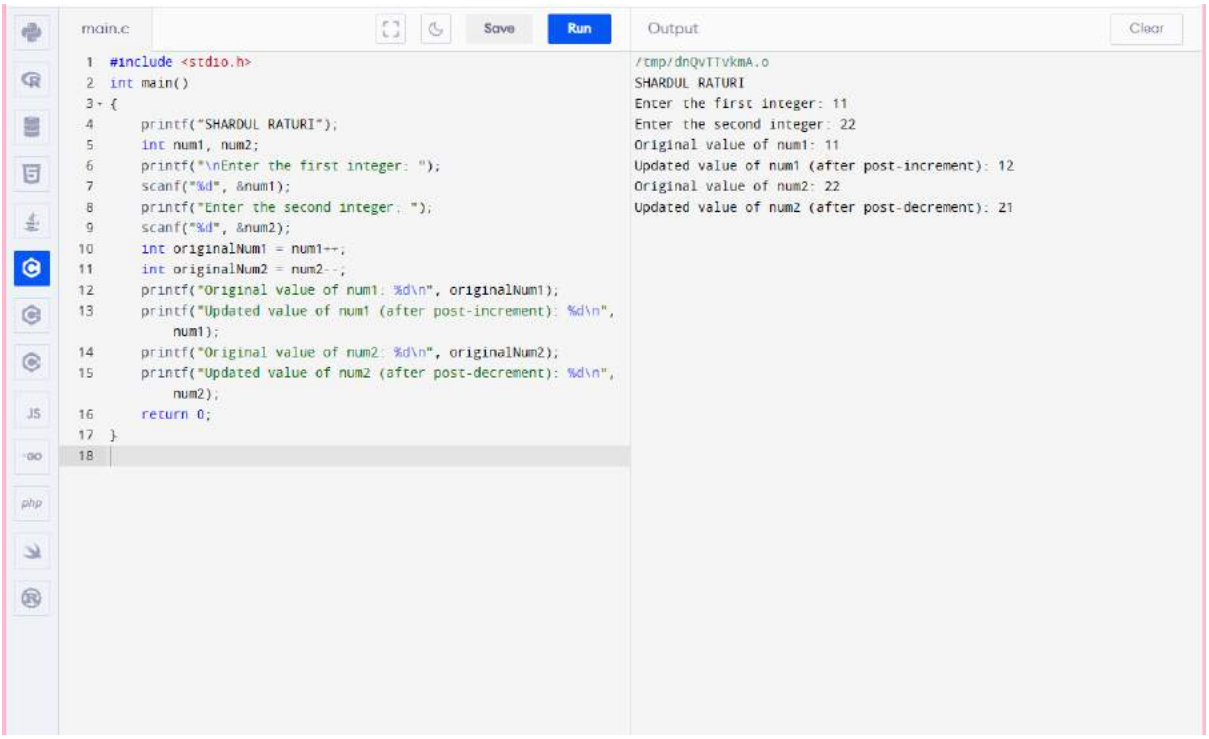
```
    scanf("%d", &num1);
    printf("Enter the second integer: ");
    scanf("%d", &num2);
    int updatedNum1 = ++num1;
    int updatedNum2 = --num2;
    printf("Original num1: %d, Updated num1: %d\n", num1 - 1,
updatedNum1);
    printf("Original num2: %d, Updated num2: %d\n", num2 + 1,
updatedNum2);
    return 0;
}
```



❖ PROGRAM 22: - TO PERFORM THE POST-INCREMENT AND POST-DECREMENT OPERATOR ON TWO INTEGER AND PRINT BOTH ORIGINAL VALUE AND UPDATE VALUE

```
#include <stdio.h>
int main()
{
   printf(“SHARDUL RATURI”);
   int num1, num2;
   printf("\nEnter the first integer: ");
   scanf("%d", &num1);
   printf("Enter the second integer: ");
   scanf("%d", &num2);
   int originalNum1 = num1++;
   int originalNum2 = num2--;
   printf("Original value of num1: %d\n", originalNum1);
   printf("Updated value of num1 (after post-increment): %d\n", num1);
   printf("Original value of num2: %d\n", originalNum2);
   printf("Updated value of num2 (after post-decrement): %d\n", num2);
```

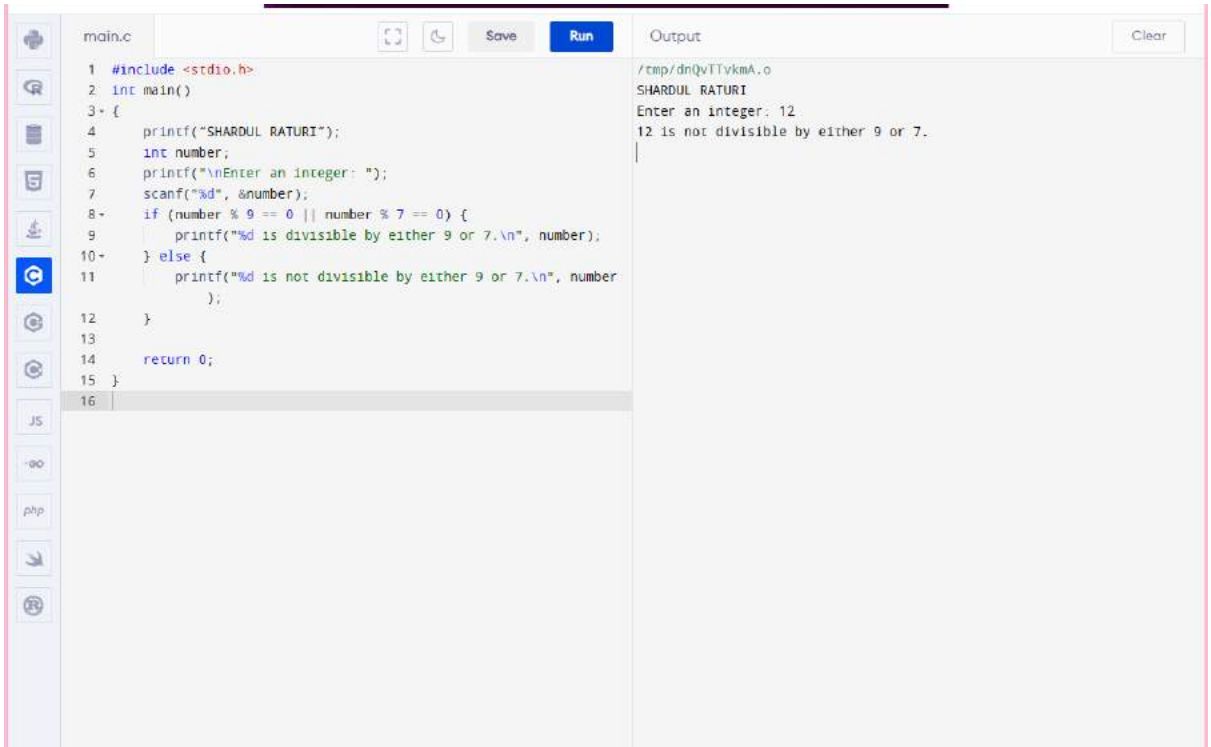
```
    return 0;
}
```



❖ PROGRAM 23: - TO CHECK WHETHER FOR AN INTEGER NUMBER THAT IT IS DIVISIBLE BY 9 OR 7 USING OR OPERATOR.

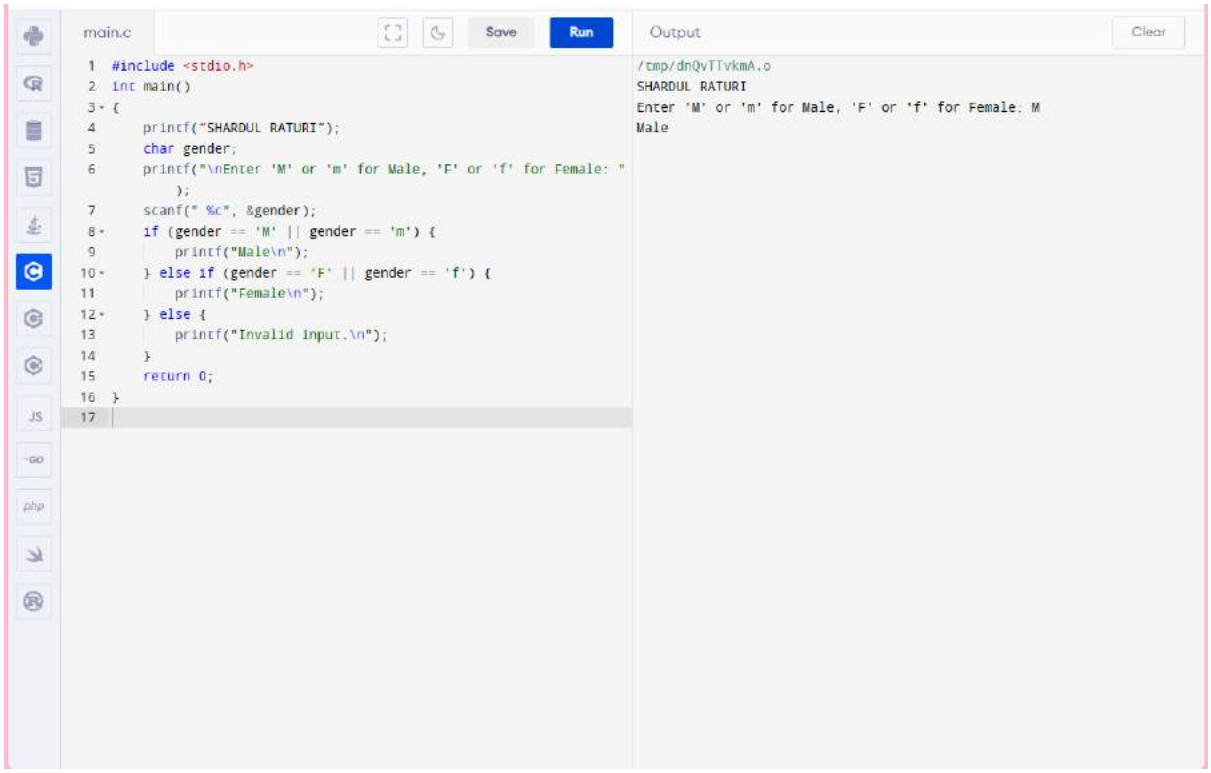
```
#include <stdio.h>
int main()
{
    printf(“SHARDUL RATURI”);
```

```
    int number;
    printf("\nEnter an integer: ");
    scanf("%d", &number);
    if (number % 9 == 0 || number % 7 == 0) {
        printf("%d is divisible by either 9 or 7.\n", number);
    } else {
        printf("%d is not divisible by either 9 or 7.\n", number);
    }

    return 0;
}
```



❖ PROGRAM 24: - TO IDENTIFY GENDER IN SINGLE CHARACTER AND PRINT FULL GENDER(EX: IF INPUT IS ‘M’ OR ‘m’-IT SHOULD PRINT “MALE”

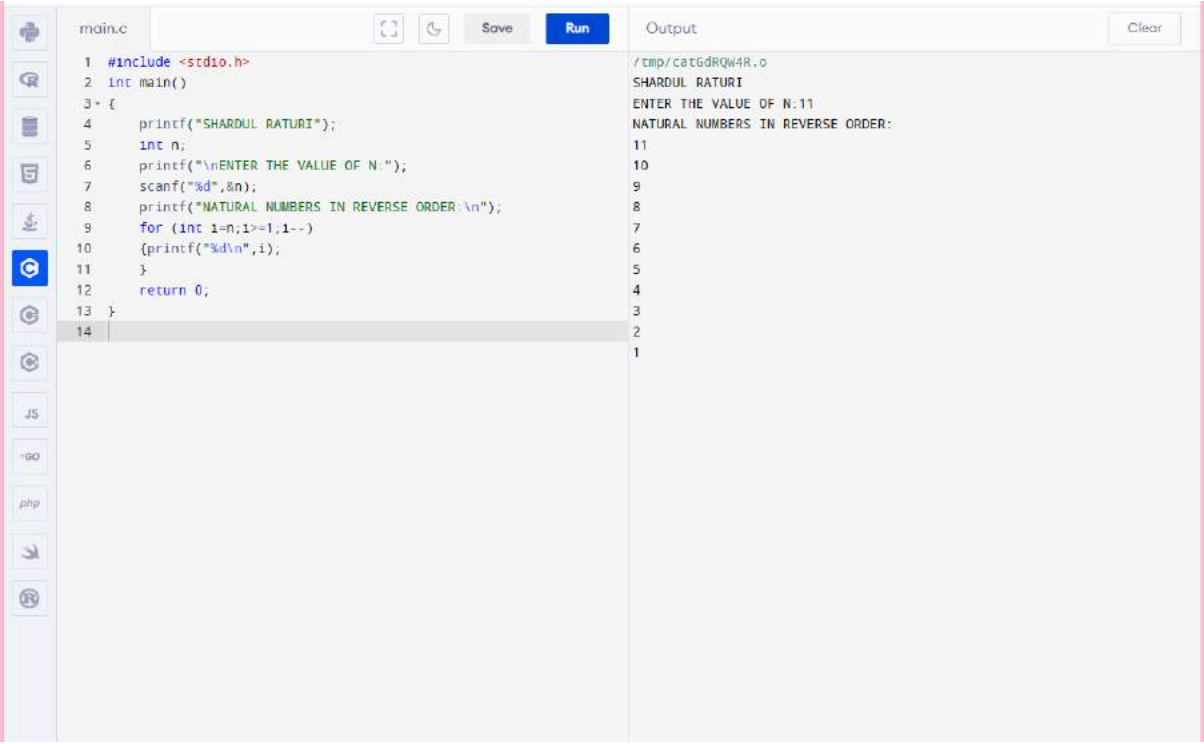
```
#include <stdio.h>
int main()
{
   printf(“SHARDUL RATURI”);
   char gender;
   printf("\nEnter 'M' or 'm' for Male, 'F' or 'f' for Female: ");
   scanf(" %c", &gender);
   if (gender == 'M' || gender == 'm') {
      printf("Male\n");
   } else if (gender == 'F' || gender == 'f') {
      printf("Female\n");
   } else {
      printf("Invalid input.\n");
   }
   return 0;
}
```



❖ PROGRAM 25:- TO PRINT ALL NATURAL NUMBERS IN REVERSE (FROM n TO 1)

```
#include <stdio.h>

int main()

{

   printf("SHARDUL RATURI");

   int n;

   printf("\nENTER THE VALUE OF N:");

   scanf("%d",&n);

   printf("NATURAL NUMBERS IN REVERSE ORDER:\n");
```

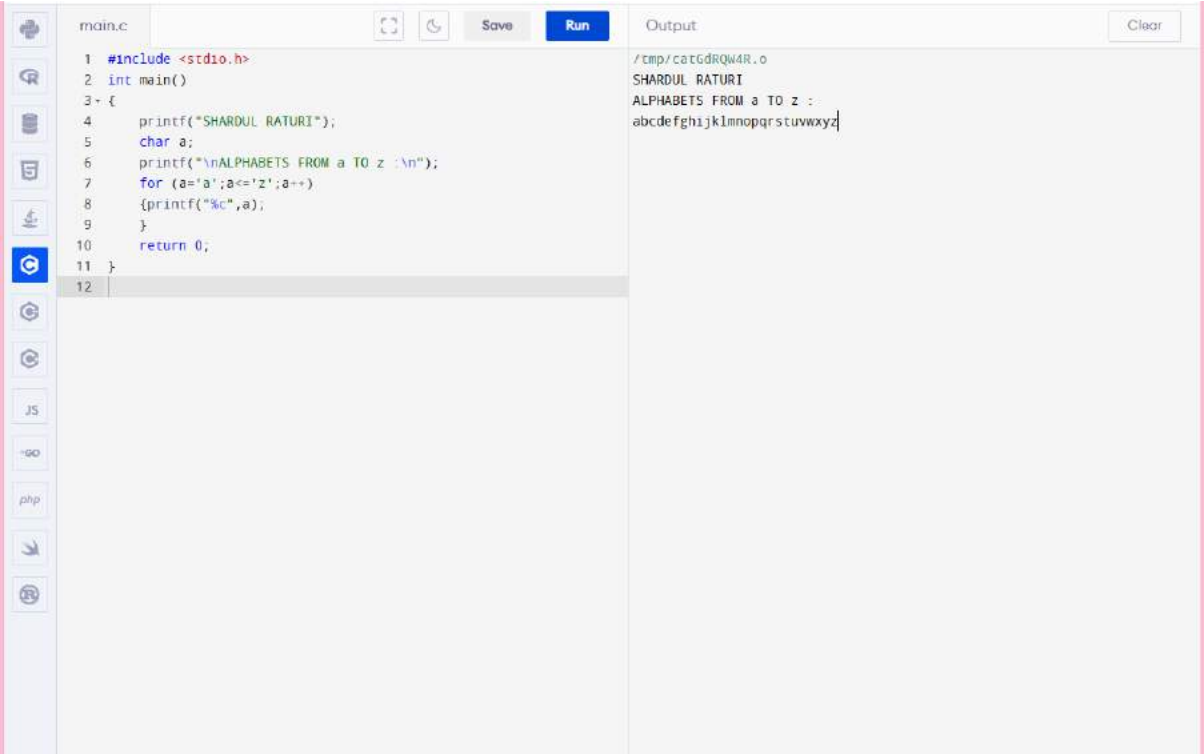
```
    for (int i=n;i>=1;i--)
    {printf("%d\n",i);
    }
    return 0;
}
```



❖ PROGRAM 26:- TO PRINT ALL ALPHABET FROM a TO z

```
#include <stdio.h>
int main()
{
    printf("SHARDUL RATURI");
    char a;
```

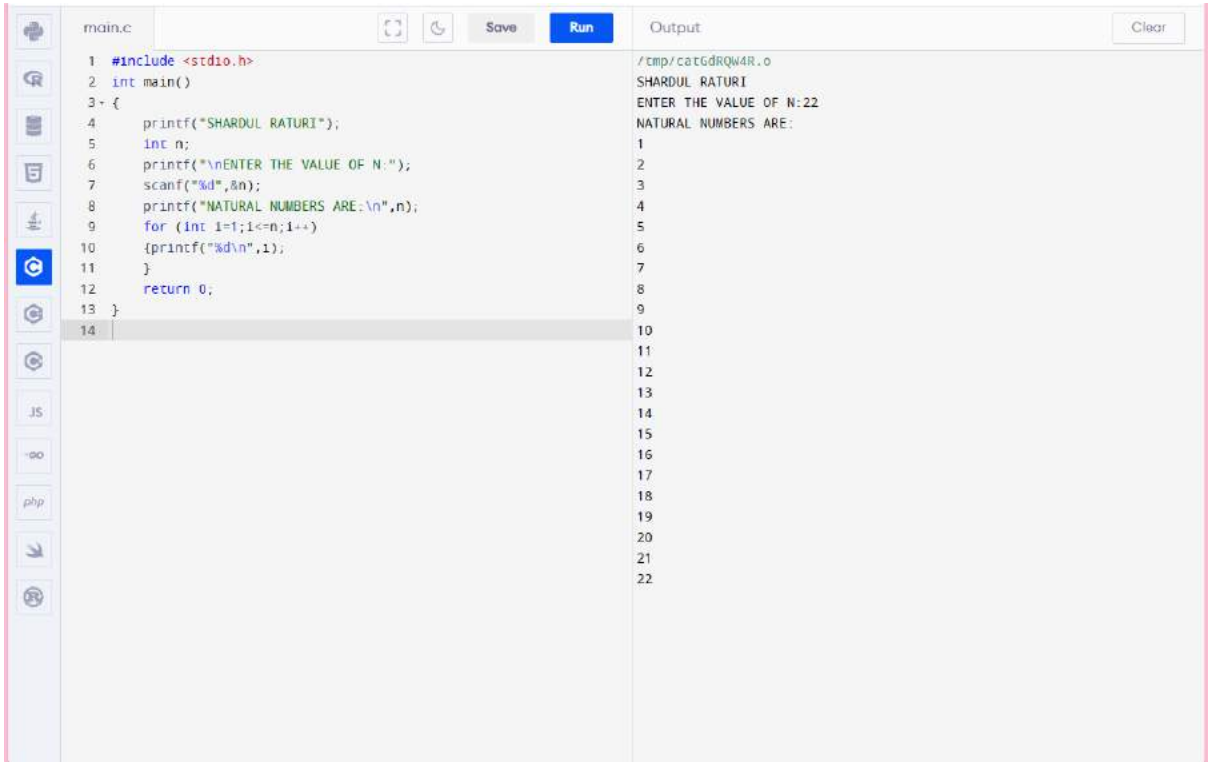
```
    printf("\nALPHABETS FROM a TO z :\n");
    for (a='a';a<='z';a++)
    {printf("%c",a);
    }
    return 0;
}
```



❖ PROGRAM 27:- TO PRINT ALL NATURAL NUMBERS FROM 1 TO n

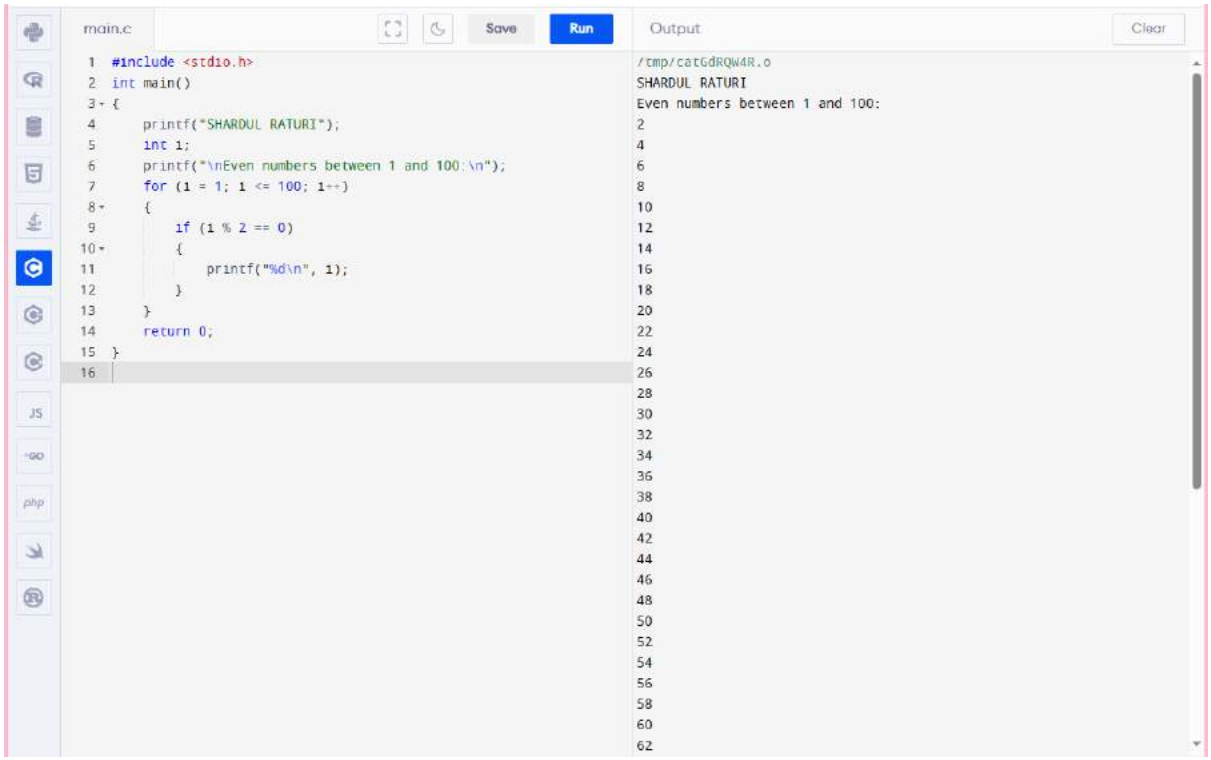
```
#include <stdio.h>
int main()
{
    printf("SHARDUL RATURI");
```

```
    int n;
    printf("\nENTER THE VALUE OF N:");
    scanf("%d",&n);
    printf("NATURAL NUMBERS ARE:\n",n);
    for (int i=1;i<=n;i++)
    {printf("%d\n",i);
    }
    return 0;
}
```



❖ PROGRAM 28:- TO PRINT ALL EVEN NUMBERS BETWEEN 1 TO 100

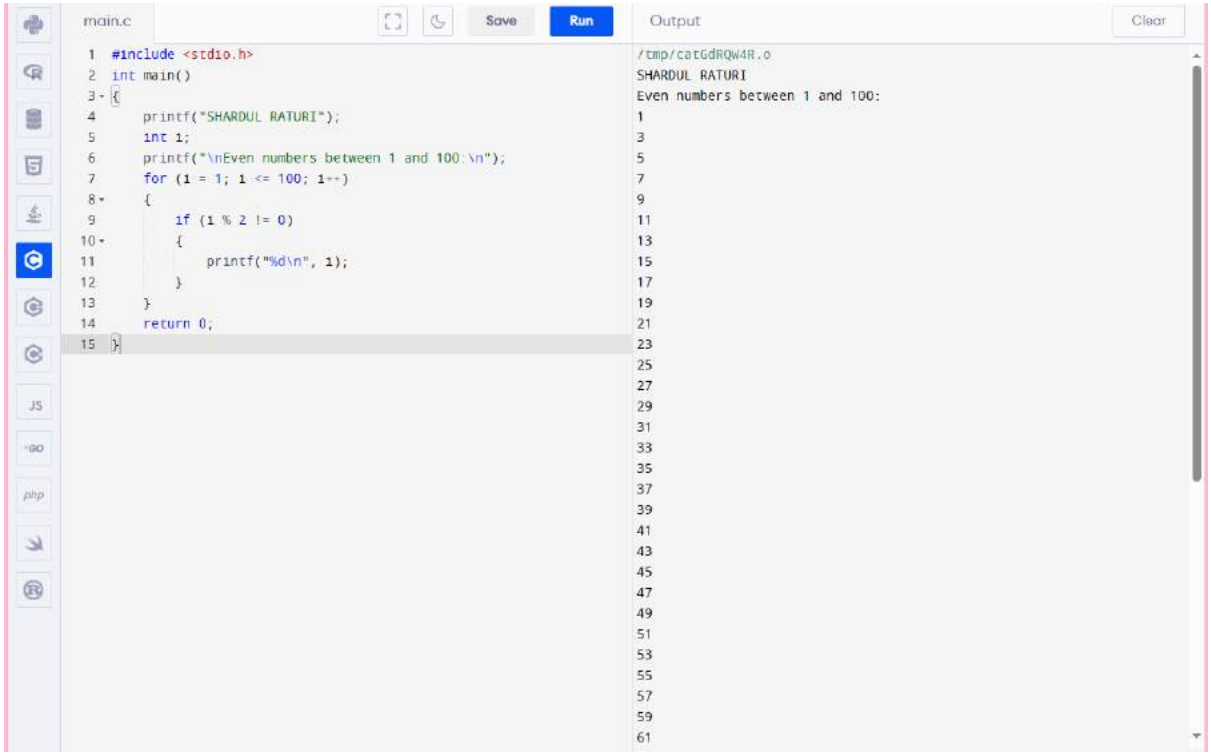
```
#include <stdio.h>
int main()
{
   printf("SHARDUL RATURI");
   int i;
   printf("\nEven numbers between 1 and 100:\n");
   for (i = 1; i <= 100; i++)
   {
      if (i % 2 == 0)
      {
         printf("%d\n", i);
      }
   }
   return 0;
}
```



PROGRAM 29:- TO PRINT ALL ODD NUMBER BETWEEN 1 TO 100

```
#include <stdio.h>

int main()

{

   printf("SHARDUL RATURI");

   int i;

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

   for (i = 1; i <= 100; i++)

   {

      if (i % 2 != 0)

      {

         printf("%d\n", i);
```

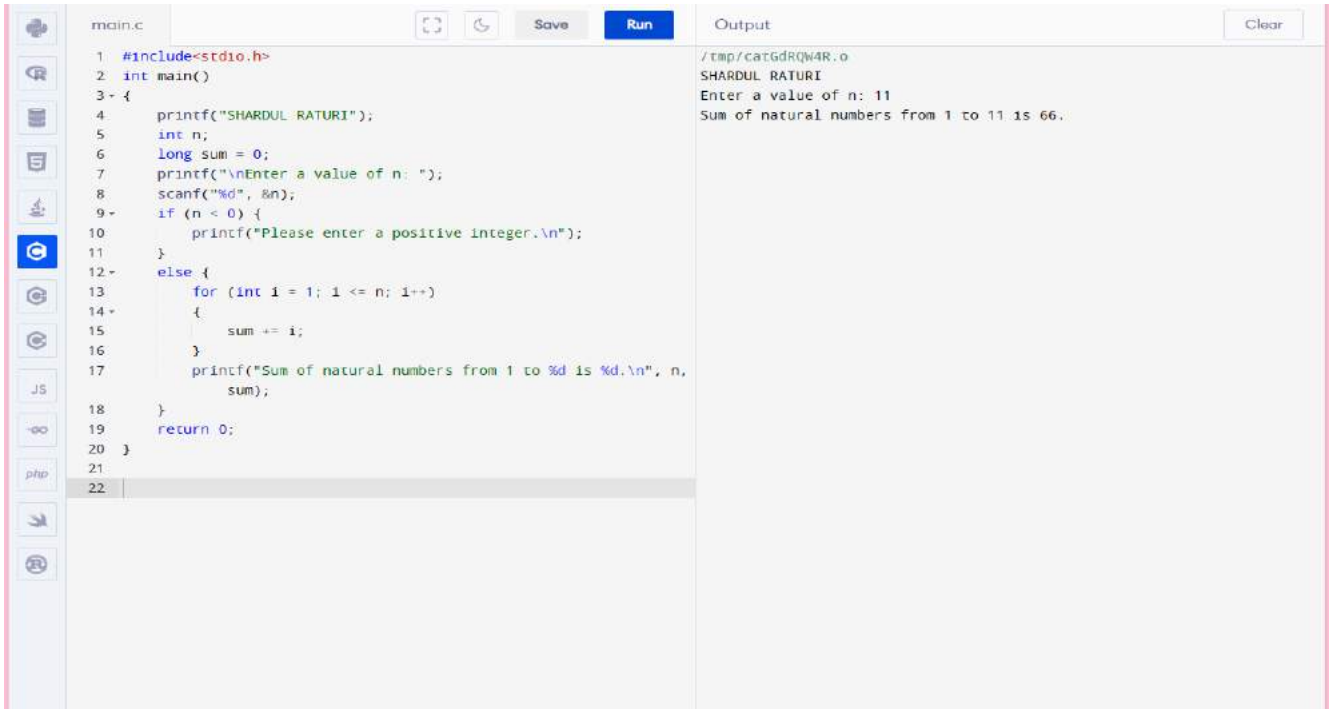
```
        }
    }
    return 0;
}
```



❖ PROGRAM 30:- TO FIND SUM OF ALL NATURAL NUMBERS BETWEEN 1 TO N

```
#include<stdio.h>
int main()
{
    printf("SHARDUL RATURI");
```

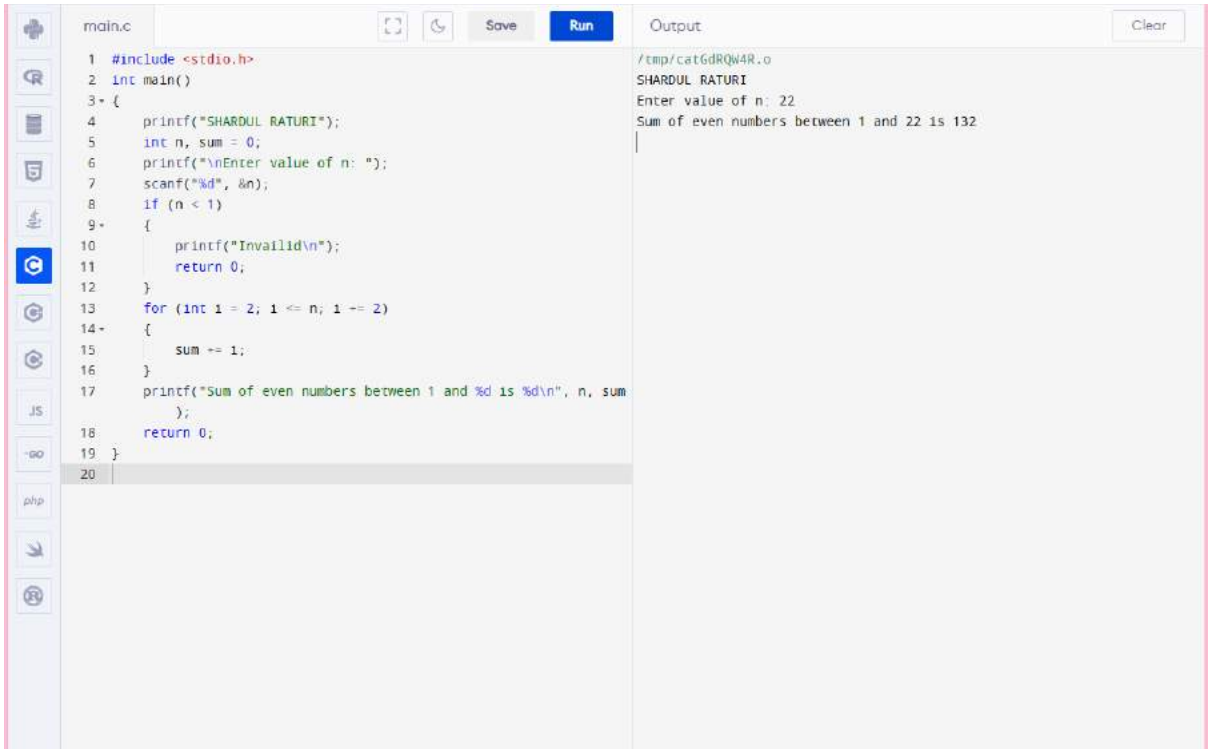
```
    int n;
    long sum = 0;
    printf("\nEnter a value of n: ");
    scanf("%d", &n);
    if (n < 0) {
        printf("Please enter a positive integer.\n");
    }
    else {
        for (int i = 1; i <= n; i++)
        {
            sum += i;
        }
        printf("Sum of natural numbers from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



❖ PROGRAM 31:- TO FIND SUM AF ALL EVEN NUMBER BETWEEN 1 TO N

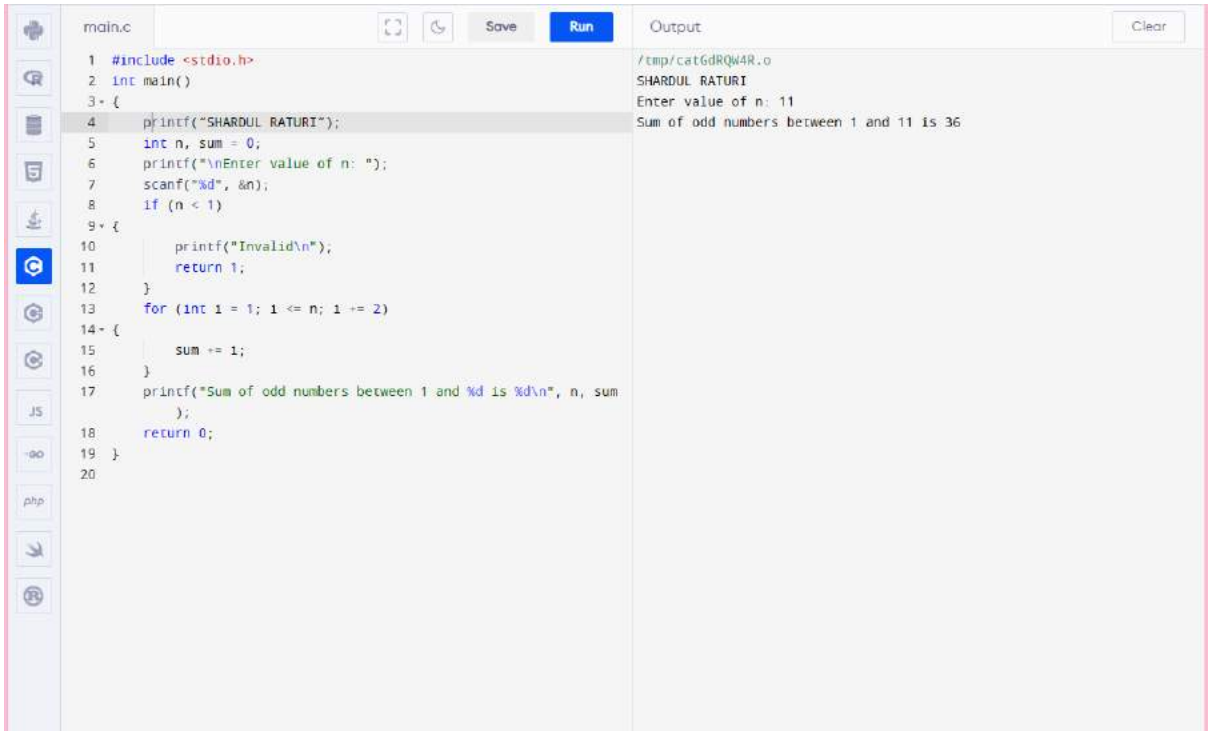
```
#include <stdio.h>
int main()
{
   printf("SHARDUL RATURI");
   int n, sum = 0;
   printf("\nEnter value of n: ");
   scanf("%d", &n);
   if (n < 1)
   {
      printf("Invailid\n");
      return 0;
```

```
    }
    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;
}
```



❖ PROGRAM 32:- TO FIND SUM OF ALL ODD NUMBER BETWEEN 1 TO N

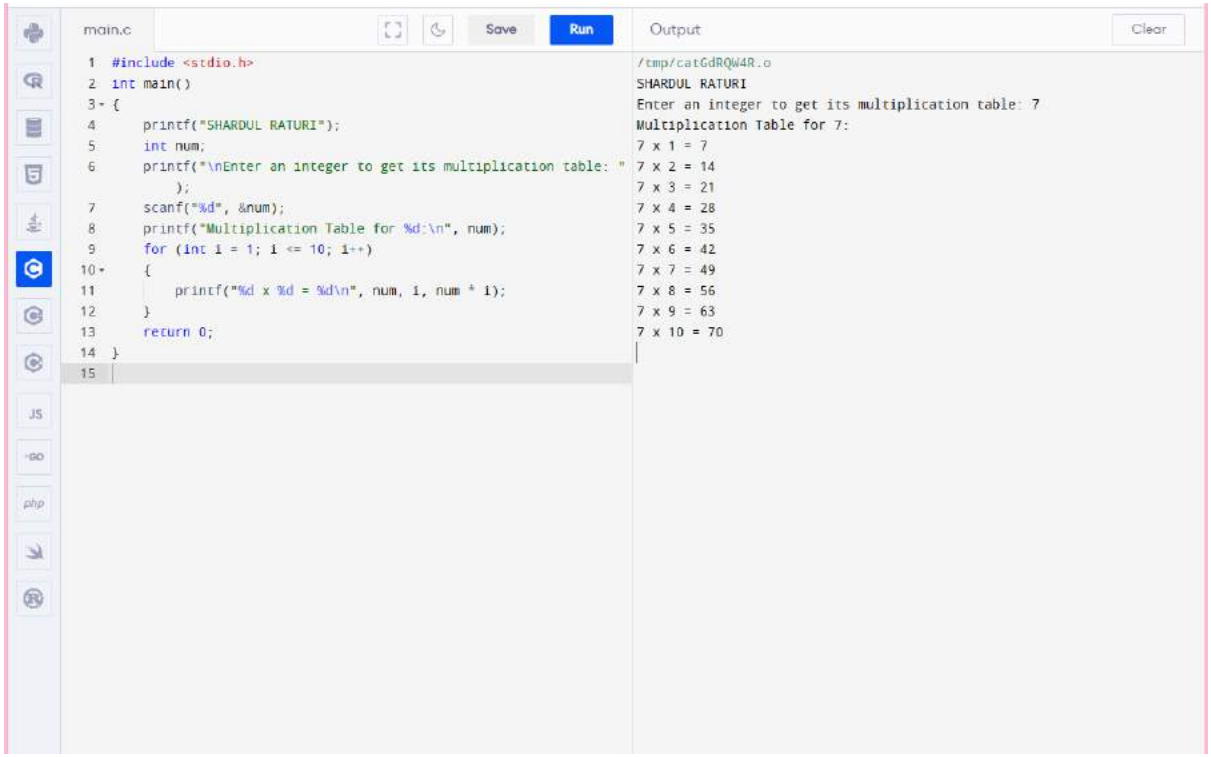
```
#include <stdio.h>
int main()
{
   Printf(“SHARDUL RATURI”);
   int n, sum = 0;
   printf("\nEnter value of n: ");
   scanf("%d", &n);
   if (n < 1)
{
      printf("Invalid\n");
      return 1;
   }
   for (int i = 1; i <= n; i += 2)
{
      sum += i;
   }
   printf("Sum of odd numbers between 1 and %d is %d\n", n, sum);
   return 0;
}
```



❖ PROGRAM 33:- TO PRINT MULTIPLICATION TABLE OF ANY NUMBER

```
#include <stdio.h>

int main()

{

   printf("SHARDUL RATURI");

   int num;

   printf("\nEnter an integer to get its multiplication table: ");

   scanf("%d", &num);

   printf("Multiplication Table for %d:\n", num);

   for (int i = 1; i <= 10; i++)

   {
```

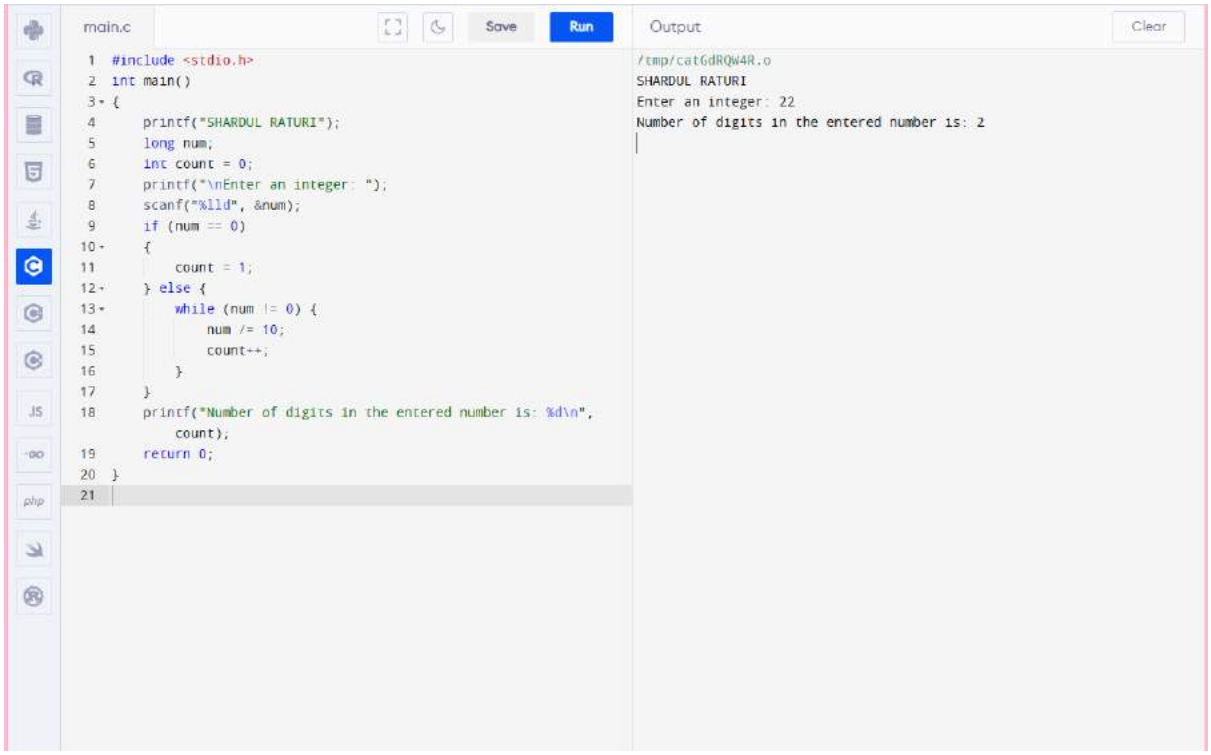
```
        printf("%d x %d = %d\n", num, i, num * i);
    }
    return 0;
}
```



❖ PROGRAM 34:- TO COUNT NUMBERS OF DIGITS IN A NUMBER

```
#include <stdio.h>
int main()
{
    printf("SHARDUL RATURI");
    long num;
    int count = 0;
```

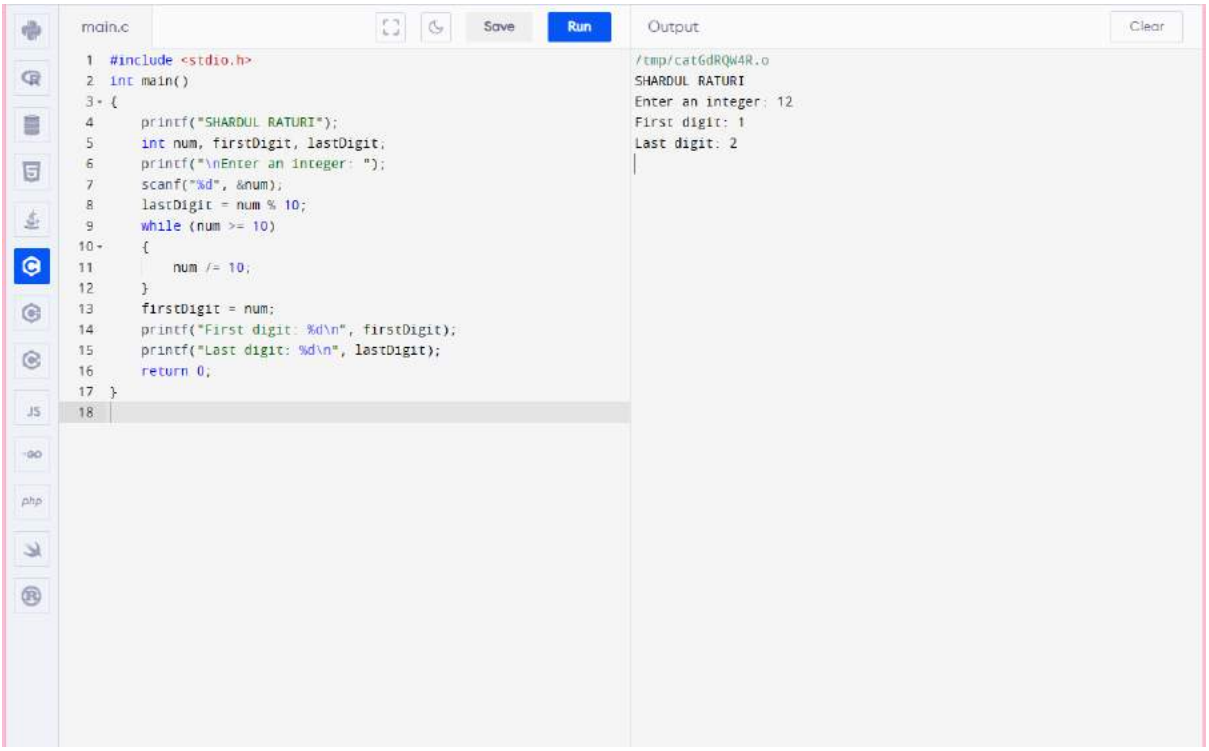
```
    printf("\nEnter an integer: ");
    scanf("%lld", &num);
    if (num == 0)
    {
        count = 1;
    } else {
        while (num != 0) {
            num /= 10;
            count++;
        }
    }
    printf("Number of digits in the entered number is: %d\n", count);
    return 0;
}
```



❖ PROGRAM 35:- TO FIND FIRST AND LAST DIGIT OF A NUMBER

```
#include <stdio.h>
int main()
{
   printf("SHARDUL RATURI");
   int num, firstDigit, lastDigit;
   printf("\nEnter an integer: ");
   scanf("%d", &num);
   lastDigit = num % 10;
```

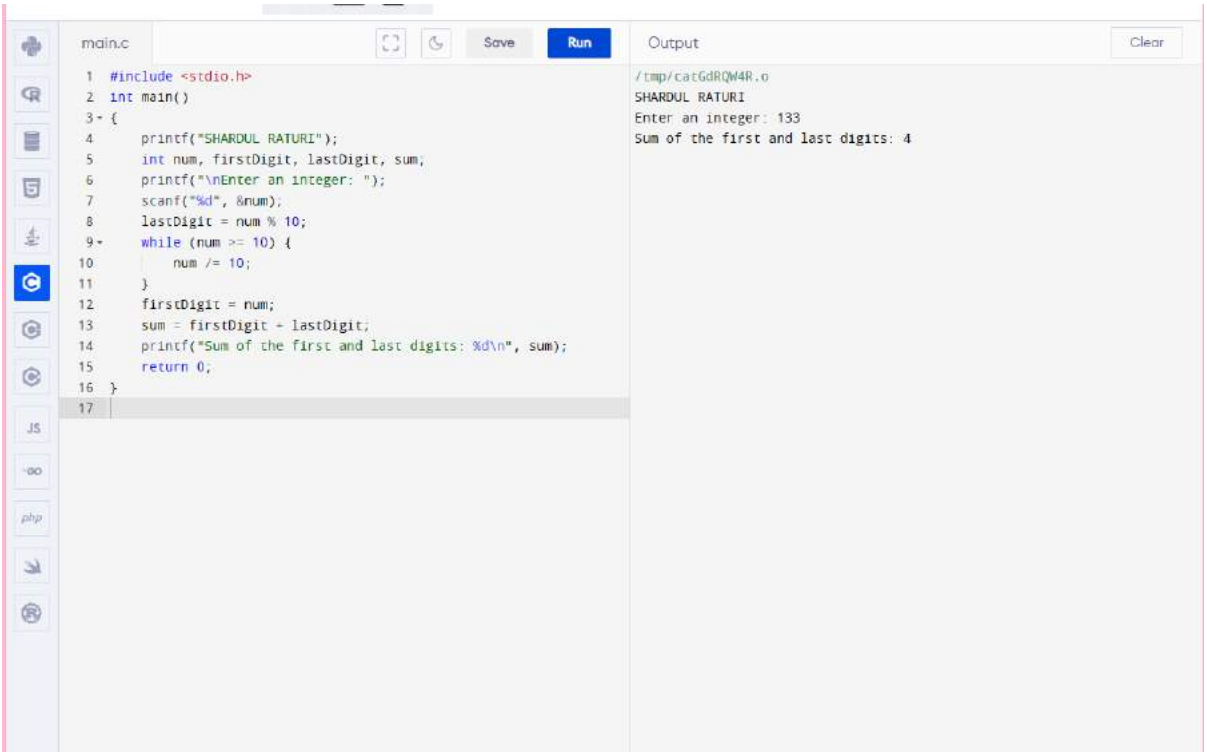
```
    while (num >= 10)
    {
        num /= 10;
    }
    firstDigit = num;
    printf("First digit: %d\n", firstDigit);
    printf("Last digit: %d\n", lastDigit);
    return 0;
}
```



PROGRAM 36:- TO FIND SUM OF FIRST AND LAST DIGIT OF A NUMBER

```
#include <stdio.h>
int main()
{
   printf("SHARDUL RATURI");
   int num, firstDigit, lastDigit, sum;
   printf("\nEnter an integer: ");
   scanf("%d", &num);
   lastDigit = num % 10;
   while (num >= 10) {
      num /= 10;
   }
```

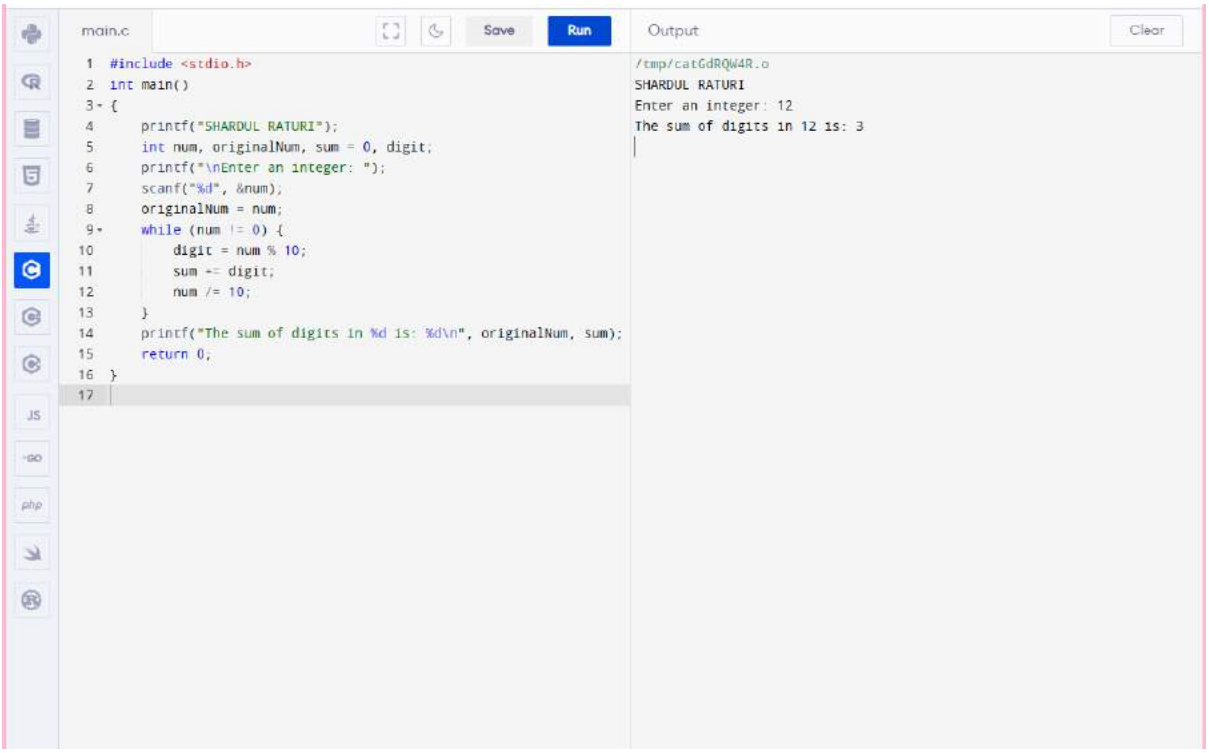
```
    firstDigit = num;
    sum = firstDigit + lastDigit;
    printf("Sum of the first and last digits: %d\n", sum);
    return 0;
}
```



❖ PROGRAM 38:- TO CALCULATE SUM OF DIGITS IN A NUMBER

```
#include <stdio.h>
int main()
{
    printf("SHARDUL RATURI");
```

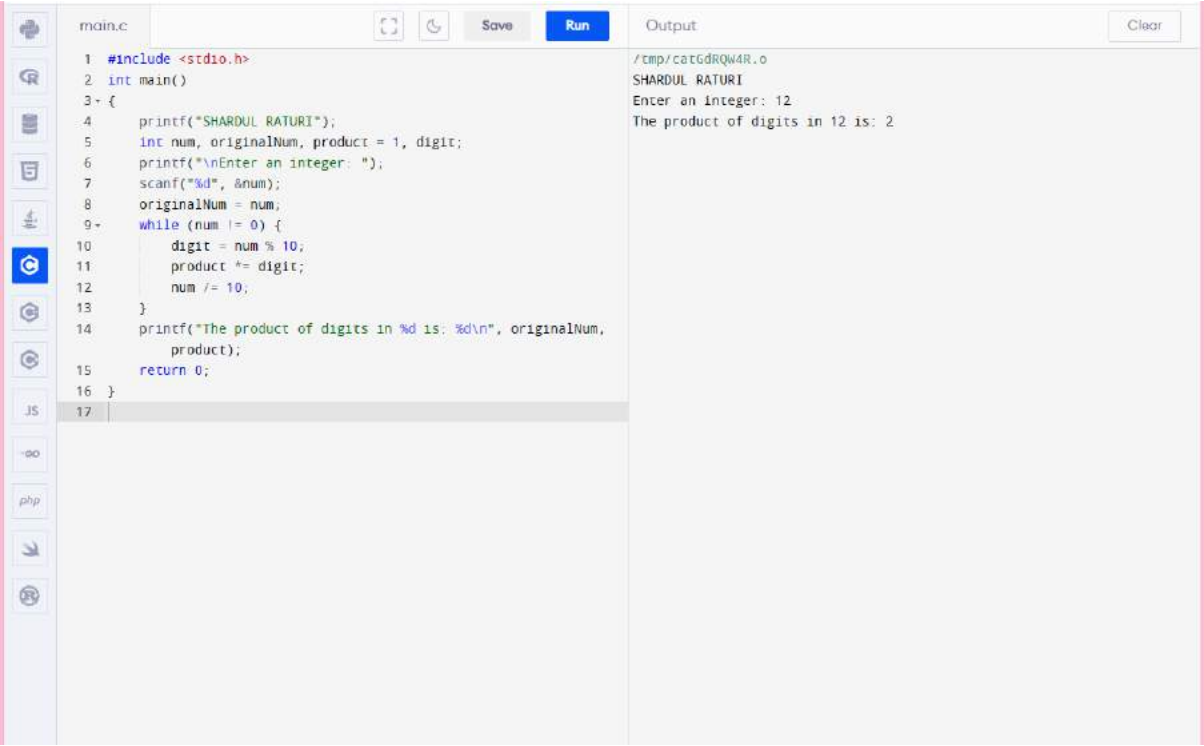
```
    int num, originalNum, sum = 0, digit;
    printf("\nEnter an integer: ");
    scanf("%d", &num);
    originalNum = num;
    while (num != 0) {
        digit = num % 10;
        sum += digit;
        num /= 10;
    }
    printf("The sum of digits in %d is: %d\n", originalNum, sum);
    return 0;
}
```



❖ PROGRAM 39:- TO CALCULATE PRODUCT OF DIGITS OF A NUMBER

```
#include <stdio.h>
int main()
{
   printf("SHARDUL RATURI");
   int num, originalNum, product = 1, digit;
   printf("\nEnter an integer: ");
   scanf("%d", &num);
   originalNum = num;
   while (num != 0) {
      digit = num % 10;
```

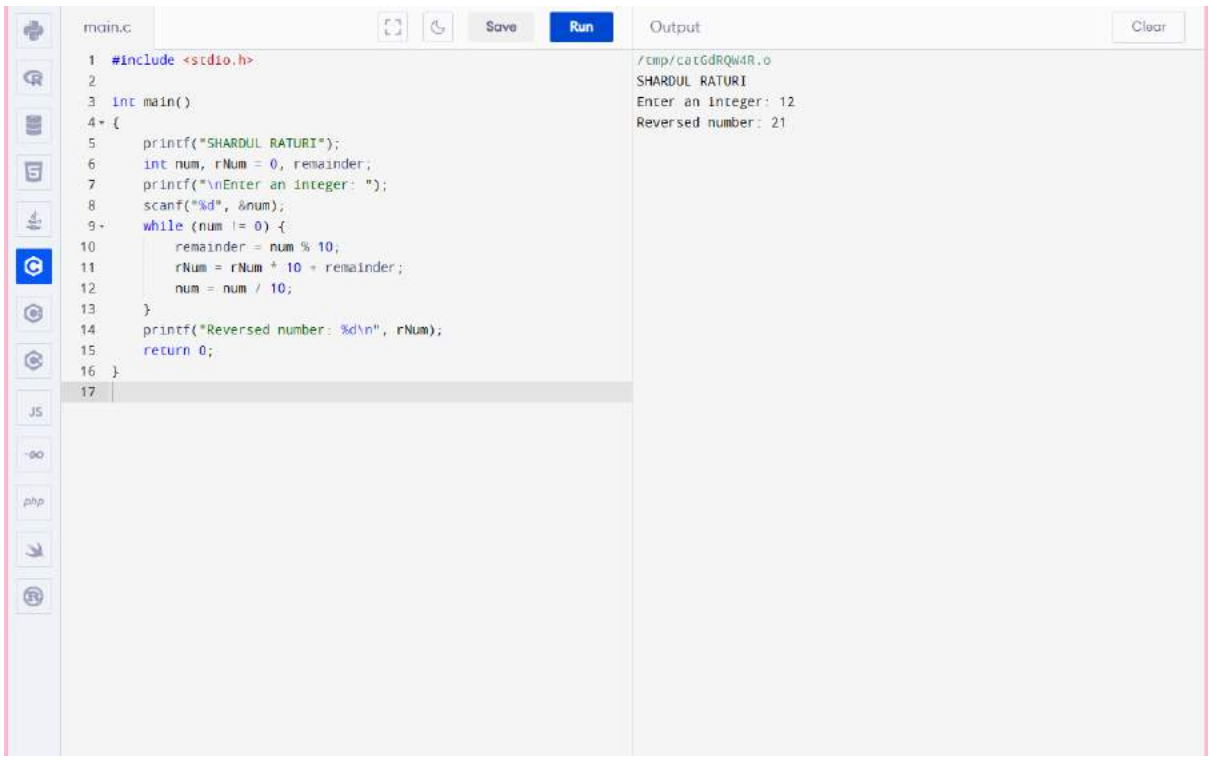
```
        product *= digit;
        num /= 10;
    }
    printf("The product of digits in %d is: %d\n", originalNum,
product);
    return 0;
}
```



❖ PROGRAM 40:- TO ENTER A NUMBER AND PRINT ITS REVERSE

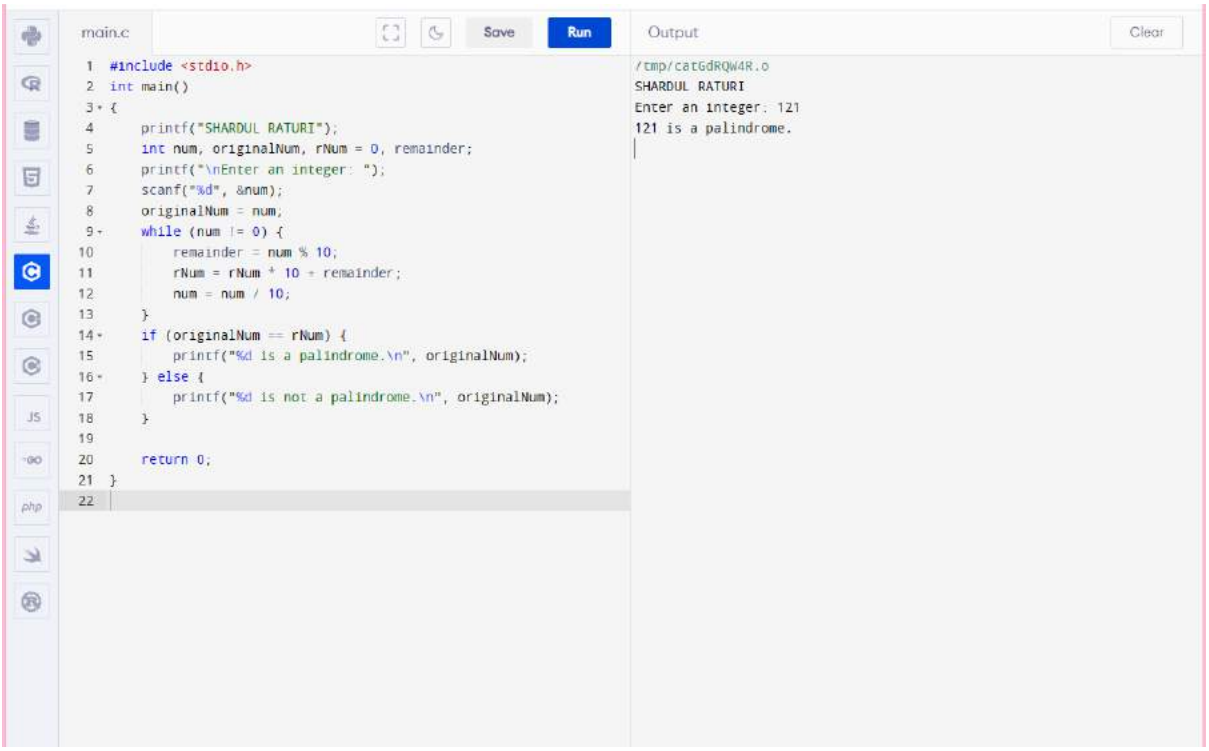
```
#include <stdio.h>


int main()
{
```

```
    printf("SHARDUL RATURI");
    int num, rNum = 0, remainder;
    printf("\nEnter an integer: ");
    scanf("%d", &num);
    while (num != 0) {
        remainder = num % 10;
        rNum = rNum * 10 + remainder;
        num = num / 10;
    }
    printf("Reversed number: %d\n", rNum);
    return 0;
}
```



❖ PROGRAM 41:- TO CHECK WHETHER THE NUMBER IS PALINDROME OR NOT

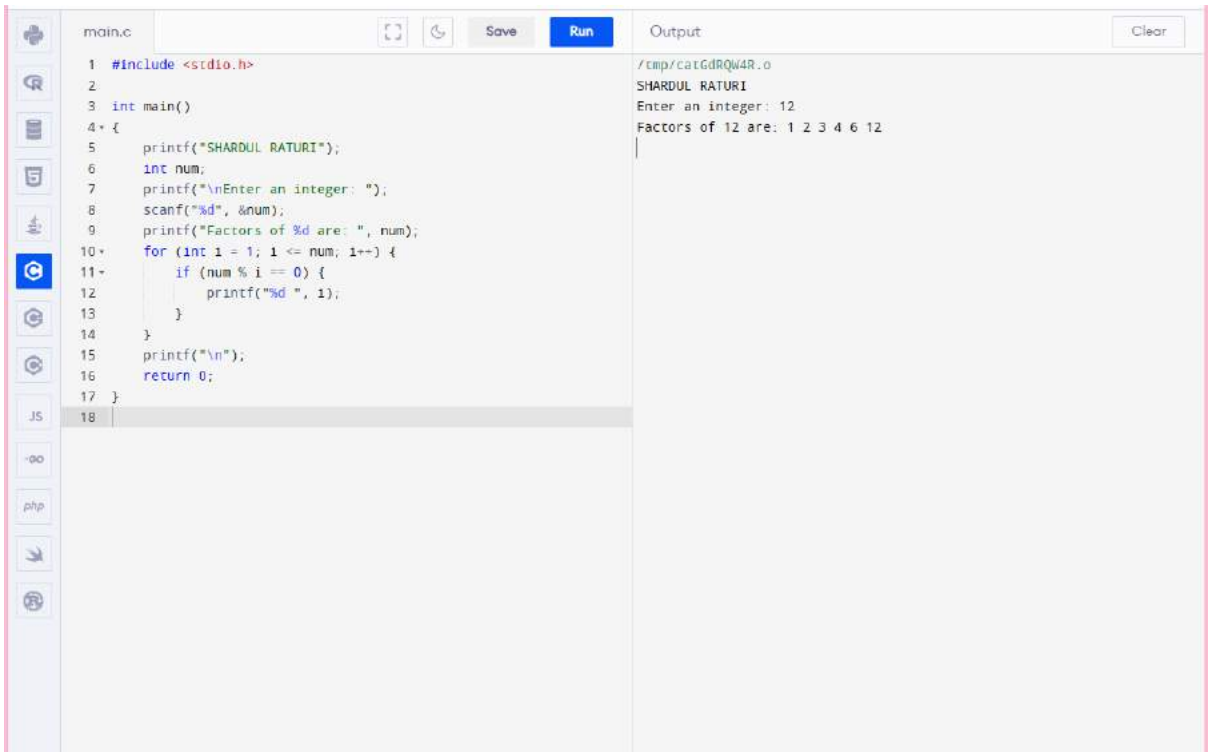
```
#include <stdio.h>
int main()
{
   printf("SHARDUL RATURI");
   int num, originalNum, rNum = 0, remainder;
   printf("\nEnter an integer: ");
   scanf("%d", &num);
   originalNum = num;
   while (num != 0) {
      remainder = num % 10;
      rNum = rNum * 10 + remainder;
      num = num / 10;
   }
   if (originalNum == rNum) {
      printf("%d is a palindrome.\n", originalNum);
   } else {
      printf("%d is not a palindrome.\n", originalNum);
   }

   return 0;
}
```



PROGRAM 42:- TO FIND ALL FACTORS OF A NUMBER

```
#include <stdio.h>


int main()
{
   printf("SHARDUL RATURI");
   int num;


   printf("\nEnter an integer: ");
   scanf("%d", &num);
   printf("Factors of %d are: ", num);
```

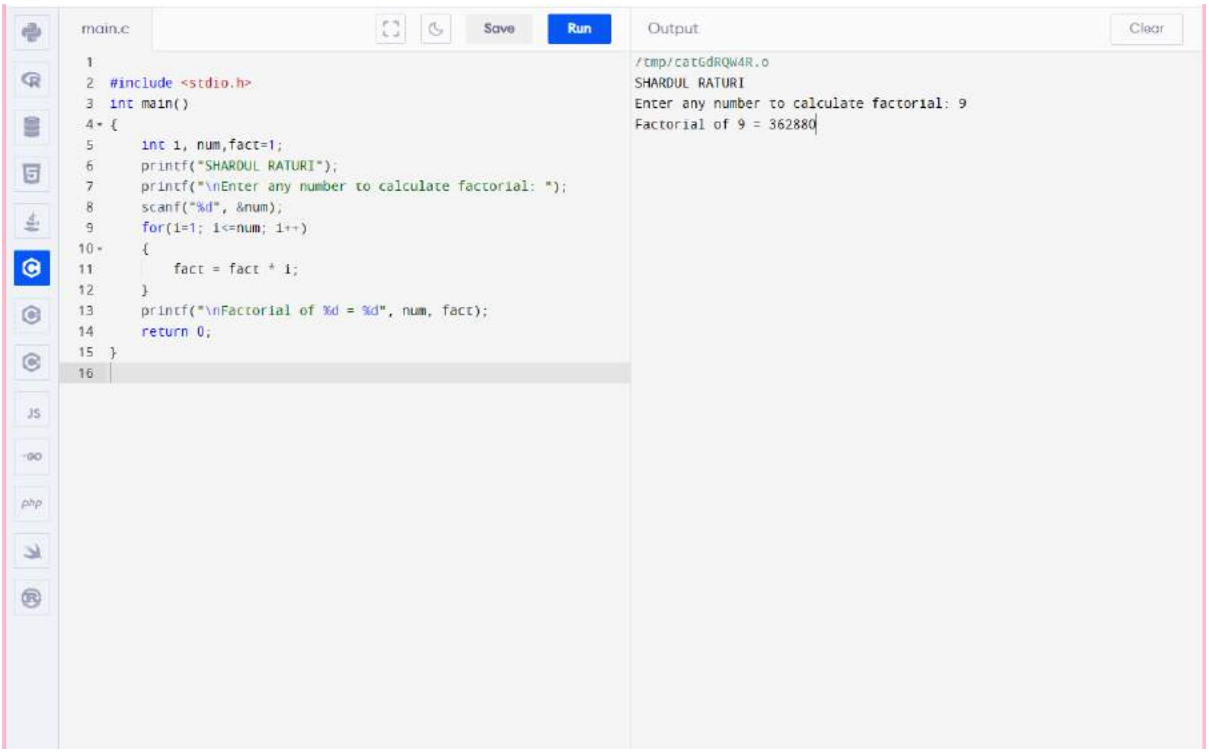
```
    for (int i = 1; i <= num; i++) {
        if (num % i == 0) {
            printf("%d ", i);
        }
    }
    printf("\n");
    return 0;
}
```



PROGRAM 43:- TO FIND FACTORIAL OF A NUMBER

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

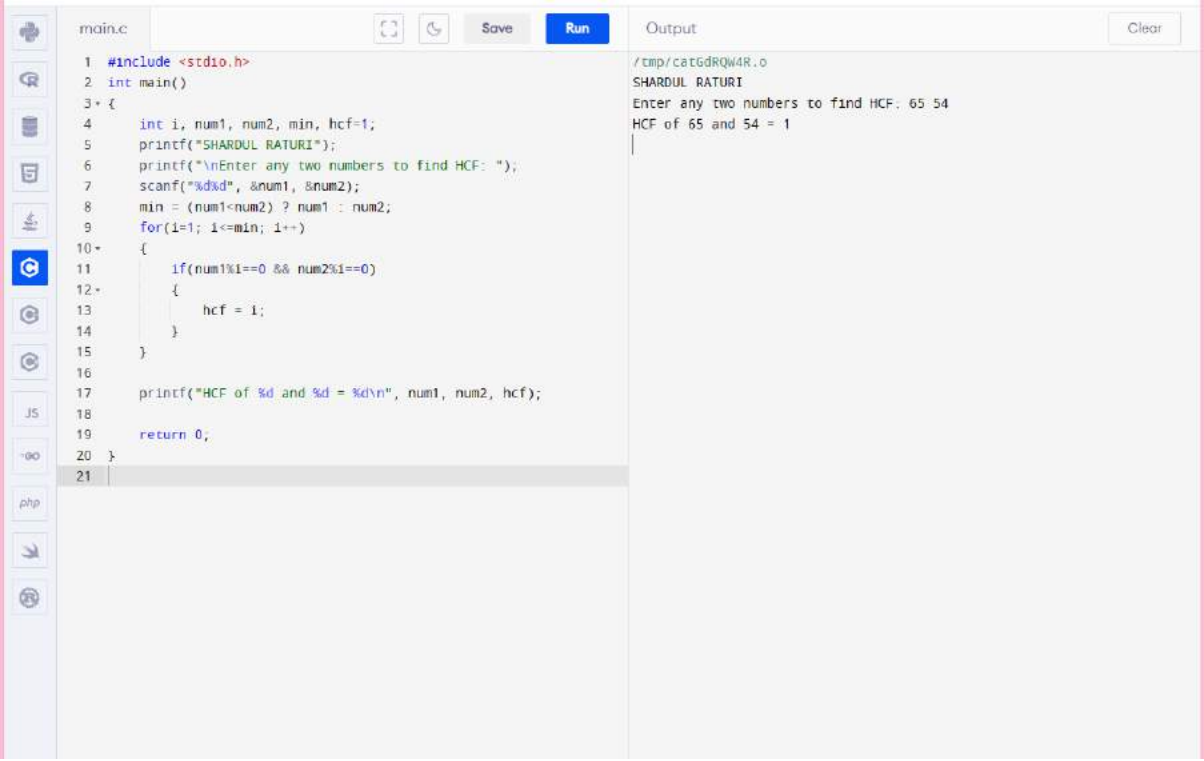
```
int main()
{
   int i, num,fact=1;
   printf("SHARDUL RATURI");
   printf("\nEnter any number to calculate factorial: ");
   scanf("%d", &num);
   for(i=1; i<=num; i++)
   {
      fact = fact * i;
   }
   printf("\nFactorial of %d = %d", num, fact);
   return 0;
}
```



PROGRAM 44:- TO FIND HCF OF TWO NUMBERS

```
#include <stdio.h>
int main()
{
   int i, num1, num2, min, hcf=1;
   printf("SHARDUL RATURI");
   printf("\nEnter any two numbers to find HCF: ");
   scanf("%d%d", &num1, &num2);
   min = (num1<num2) ? num1 : num2;
   for(i=1; i<=min; i++)
   {
      if(num1%i==0 && num2%i==0)
```

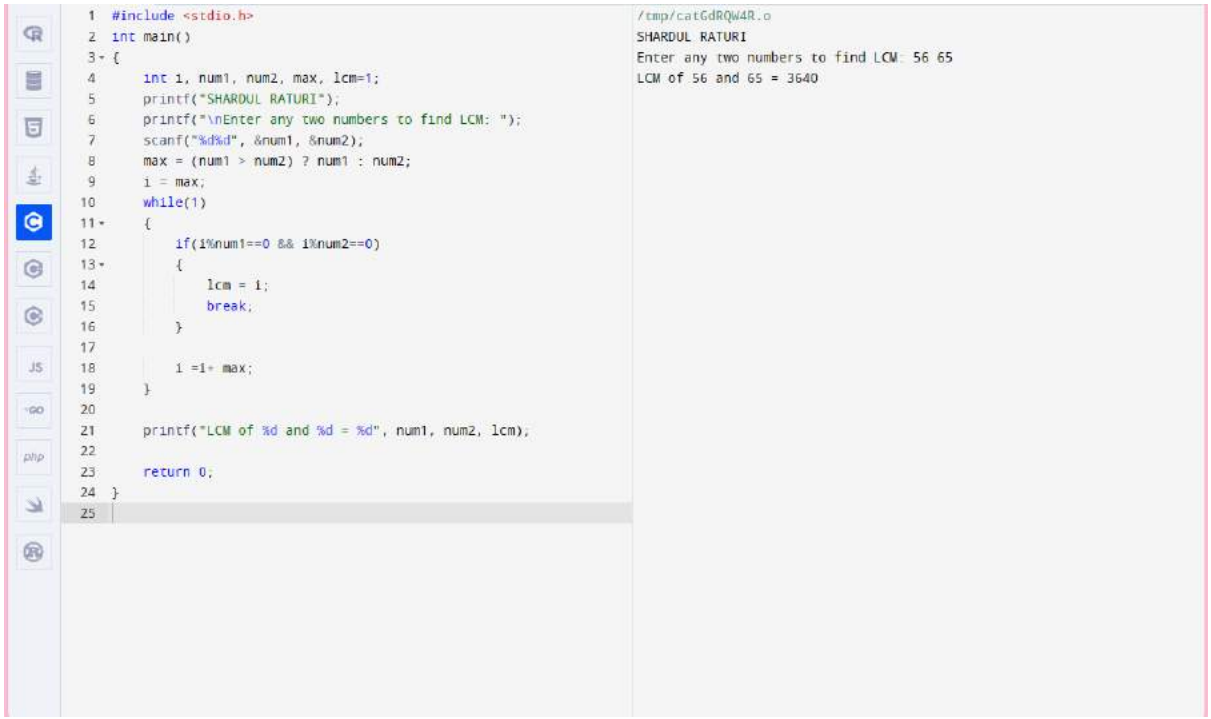
```
        {
            hcf = i;
        }
    }

    printf("HCF of %d and %d = %d\n", num1, num2, hcf);

    return 0;
}
```



PROGRAM 45:- TO FIND LCM OF TWO NUMBERS

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

```
int main()
{
   int i, num1, num2, max, lcm=1;
   printf("SHARDUL RATURI");
   printf("\nEnter any two numbers to find LCM: ");
   scanf("%d%d", &num1, &num2);
   max = (num1 > num2) ? num1 : num2;
   i = max;
   while(1)
   {
      if(i%num1==0 && i%num2==0)
      {
         lcm = i;
         break;
      }

      i =i+ max;
   }

   printf("LCM of %d and %d = %d", num1, num2, lcm);

   return 0;
}
```



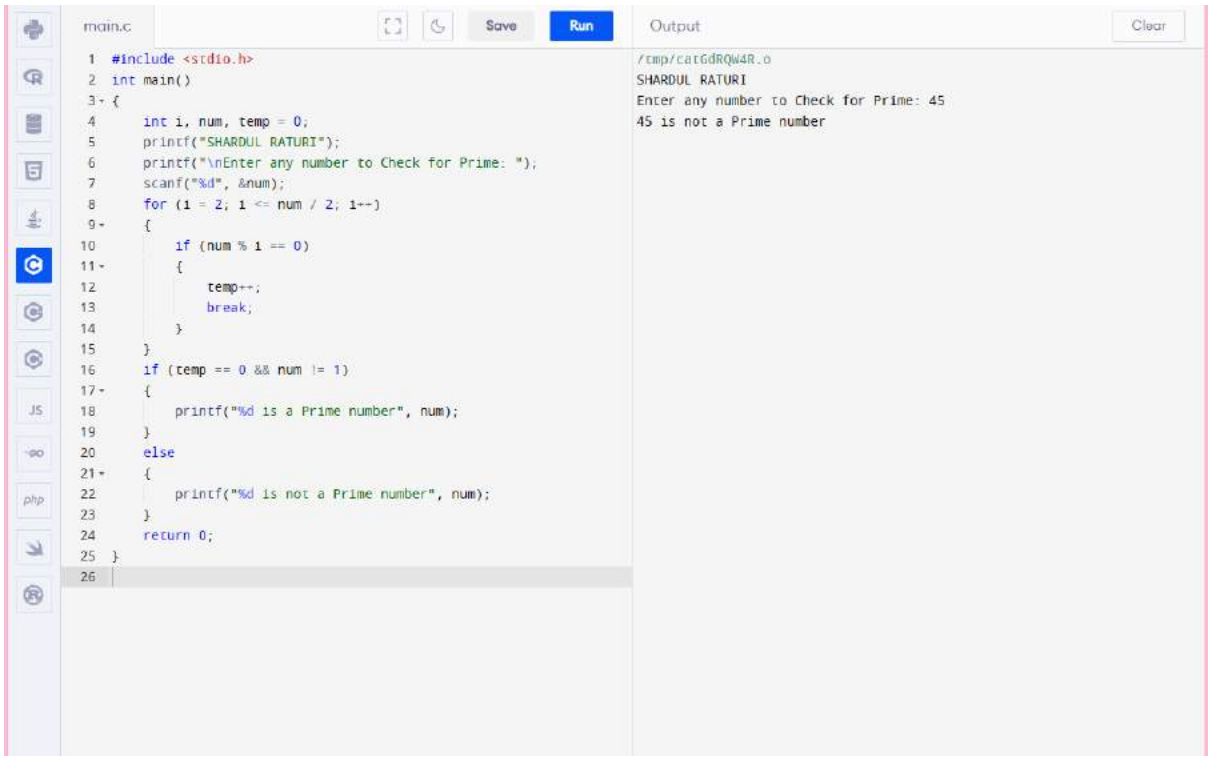
```c
#include <stdio.h>
int main()
{
    int i, num1, num2, max, lcm=1;
    printf("SHARDUL RATURI");
    printf("\nEnter any two numbers to find LCM: ");
    scanf("%d%d", &num1, &num2);
    max = (num1 > num2) ? num1 : num2;
    i = max;
    while(1)
    {
        if(i%num1==0 && i%num2==0)
        {
            lcm = i;
            break;
        }

        i =i+ max;
    }

    printf("LCM of %d and %d = %d", num1, num2, lcm);

    return 0;
}
```

```
/tmp/catGdRQW4R.o
SHARDUL RATURI
Enter any two numbers to find LCM: 56 65
LCM of 56 and 65 = 3640
```

PROGRAM 46:- TO CHECK WHETHER THE NUMBER IS PRIME OR NOT

```c
#include <stdio.h>

int main()

{

   int i, num, temp = 0;

   printf("SHARDUL RATURI");

   printf("\nEnter any number to Check for Prime: ");

   scanf("%d", &num);

   for (i = 2; i <= num / 2; i++)

   {

      if (num % i == 0)

      {

         temp++;
```

```
            break;
        }
    }
    if (temp == 0 && num != 1)
    {
        printf("%d is a Prime number", num);
    }
    else
    {
        printf("%d is not a Prime number", num);
    }
    return 0;
}
```



PROGRAM 47:- TO PRINT ALL PRIME NUMBER BETWEEN 1 to n

```
#include<stdio.h>
int main()
{
   int num,i,count,n;
   printf("SHARDUL RATURI");
   printf("\nEnter num: ");
   scanf("%d",&n);
   for(num = 1;num<=n;num++)
      {
       count = 0;
       for(i=2;i<=num/2;i++)
       {
          if(num%i==0)
          {
             count++;
             break;
          }
      }
       if(count==0 && num!= 1)
       {
          printf("%d ",num);
```

```
        }
    }

    return 0;
}
```

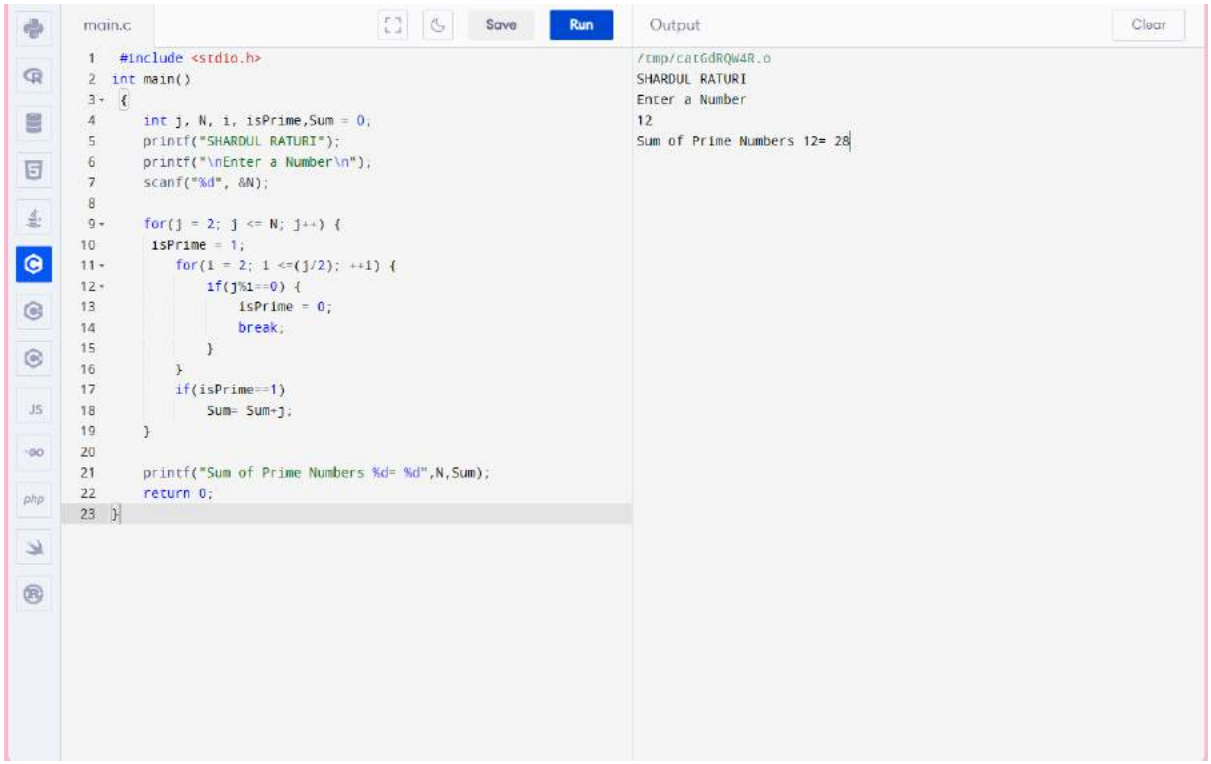
```
#include<stdio.h>
int main()
{
    int num,i,count,n;
    printf("SHARDUL RATURI");
    printf("\nEnter num: ");
    scanf("%d",&n);
    for(num = 1;num<=n;num++)
        {
         count = 0;
         for(i=2;i<=num/2;i++)
         {
             if(num%i==0)
             {
                 count++;
                 break;
             }
         }
         if(count==0 && num!= 1)
         {
             printf("%d ",num);
         }
    }

   return 0;
}
```

```
/tmp/catGdRQW4R.o
SHARDUL RATURI
Enter num: 12
2 3 5 7 11
```

PROGRAM 48:-TO FIND SUM OF ALL PRIME NUMBER BETWEEN 1 to n

```
#include <stdio.h>
int main()
{
   int j, N, i, isPrime,Sum = 0;
   printf("SHARDUL RATURI");
   printf("\nEnter a Number\n");
```

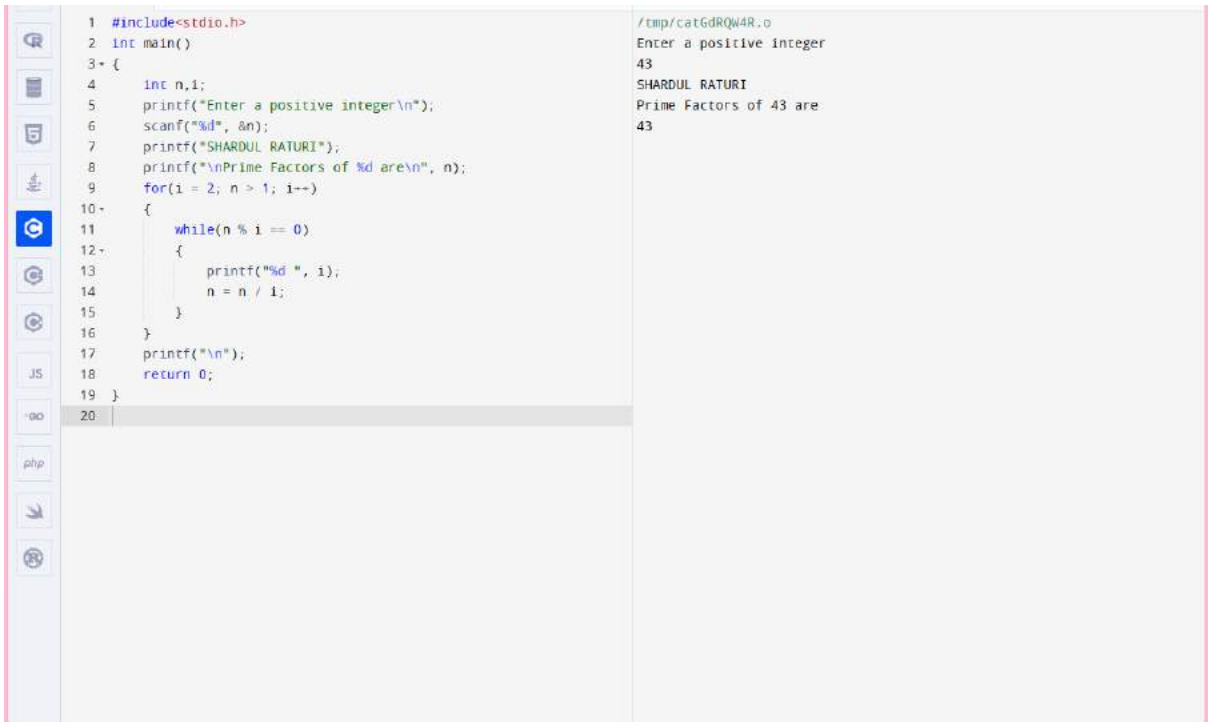
```
    scanf("%d", &N);

    for(j = 2; j <= N; j++) {
     isPrime = 1;
        for(i = 2; i <=(j/2); ++i) {
            if(j%i==0) {
                isPrime = 0;
                break;
            }
        }
        if(isPrime==1)
            Sum= Sum+j;
    }

    printf("Sum of Prime Numbers %d= %d",N,Sum);
    return 0;
}
```



PROGRAM 49:- TO FIND ALL PRIME FACTORS OF A NUMBER

```
#include<stdio.h>
int main()
{
   int n,i;
   printf("Enter a positive integer\n");
   scanf("%d", &n);
   printf("SHARDUL RATURI");
   printf("\nPrime Factors of %d are\n", n);
   for(i = 2; n > 1; i++)
   {
```

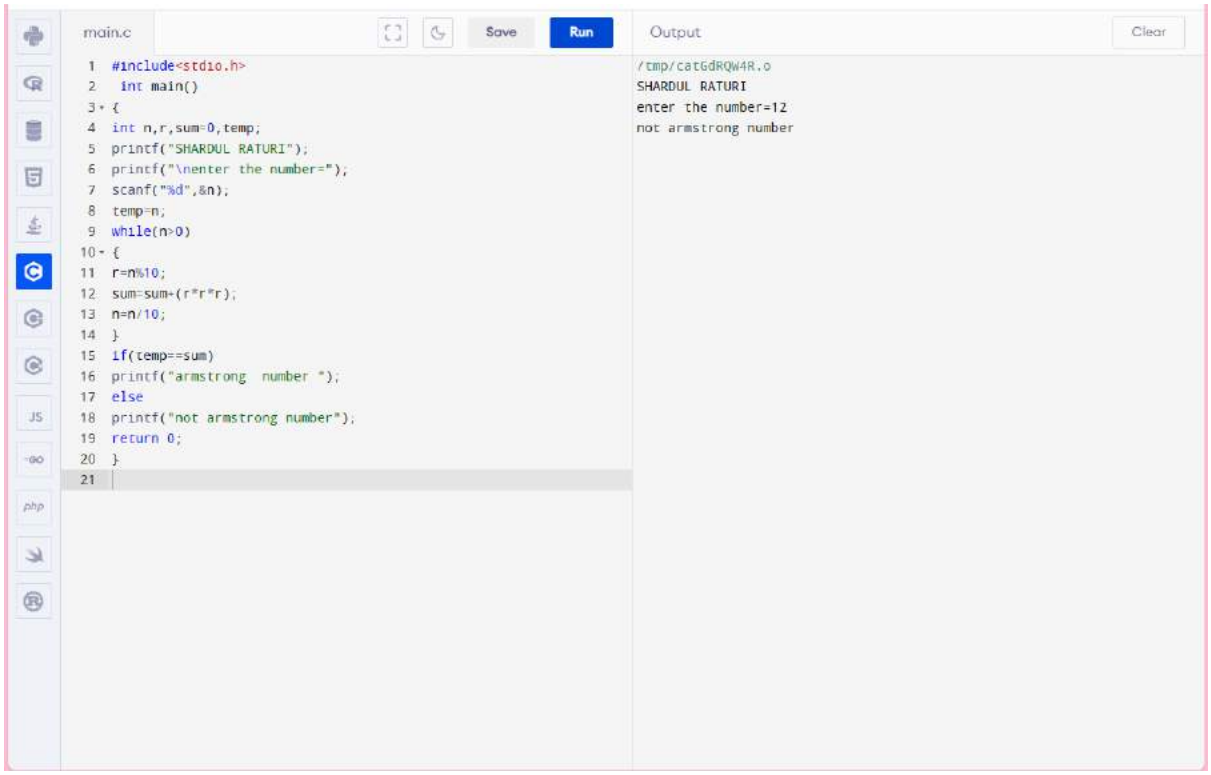
```
        while(n % i == 0)
        {
            printf("%d ", i);
            n = n / i;
        }
    }
    printf("\n");
    return 0;
}
```



PROGRAM 50:-TO CHECK WHETHER A NUMBER IS ARMSTRONG OR NOT

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

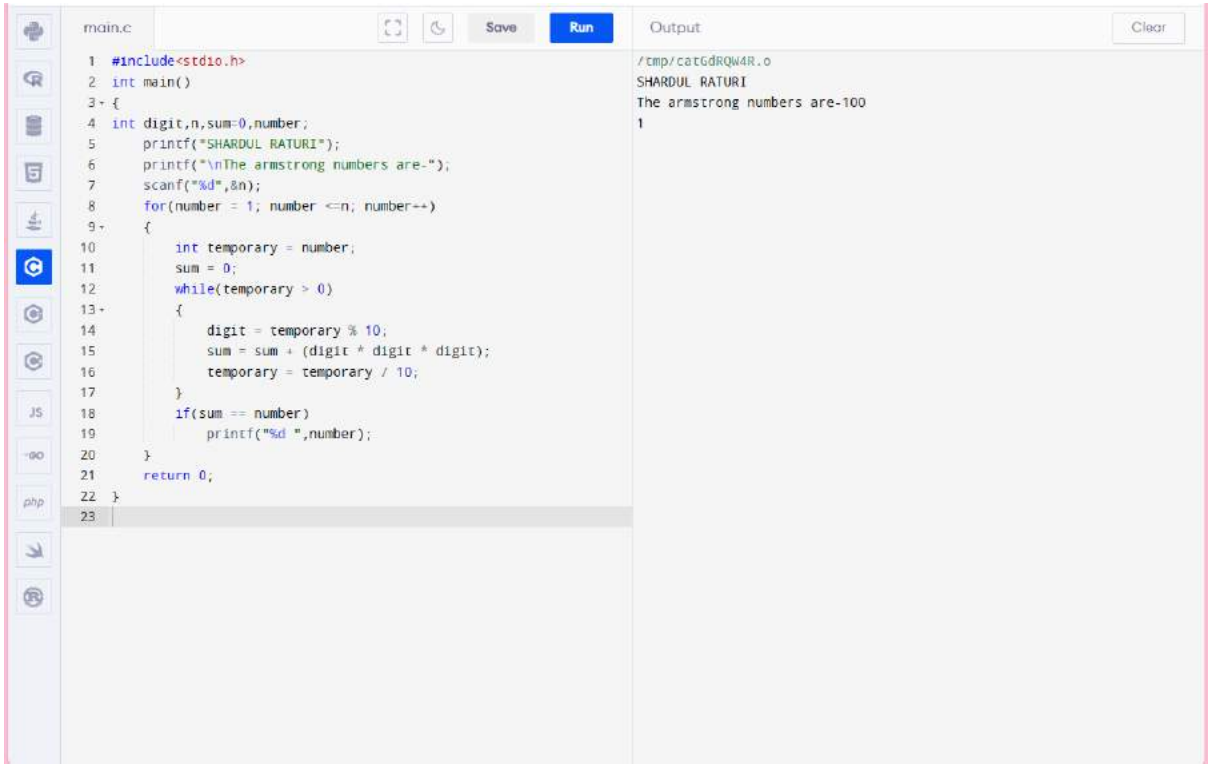
```
{
int n,r,sum=0,temp;
printf("SHARDUL RATURI");
printf("\nenter the number=");
scanf("%d",&n);
temp=n;
while(n>0)
{
r=n%10;
sum=sum+(r*r*r);
n=n/10;
}
if(temp==sum)
printf("armstrong  number ");
else
printf("not armstrong number");
return 0;
}
```



PROGRAM 51:- TO PRINT ALL ARMSTRONG NUMBER BETWEEN 1 to n

```
#include<stdio.h>
int main()
{
int digit,n,sum=0,number;
   printf("SHARDUL RATURI");
   printf("\nThe armstrong numbers are-");
   scanf("%d",&n);
   for(number = 1; number <=n; number++)
   {
      int temporary = number;
      sum = 0;
```

```
        while(temporary > 0)
        {
            digit = temporary % 10;
            sum = sum + (digit * digit * digit);
            temporary = temporary / 10;
        }
        if(sum == number)
            printf("%d ",number);
    }
    return 0;
}
```

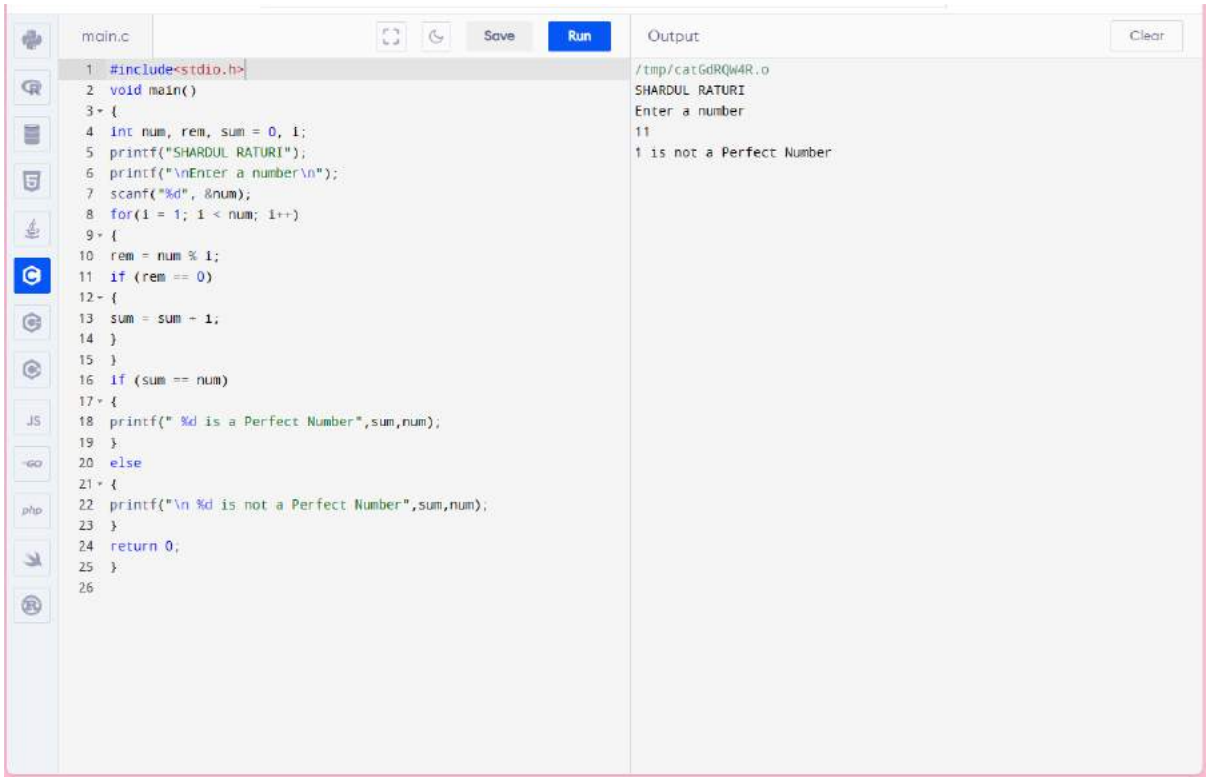


PROGRAM 52:- TO CHECK WHETHER NUMBER IS PERFECT NUMBER OR NOT

```
#include<stdio.h>
#include<conio.h>
void main()
{
int num, rem, sum = 0, i;
printf("SHARDUL RATURI");
printf("\nEnter a number\n");
scanf("%d", &num);
for(i = 1; i < num; i++)
{
rem = num % i;
if (rem == 0)
{
sum = sum + i;
}
}
if (sum == num)
{
printf(" %d is a Perfect Number",sum,num);
}
else
{
printf("\n %d is not a Perfect Number",sum,num);
}
```

return 0;

}



PROGRAM 53:- TO PRINT ALL PERFECT NUMBER BETWEEN 1 to n

#include <stdio.h>

int main()

{

int i, j, n, sum;

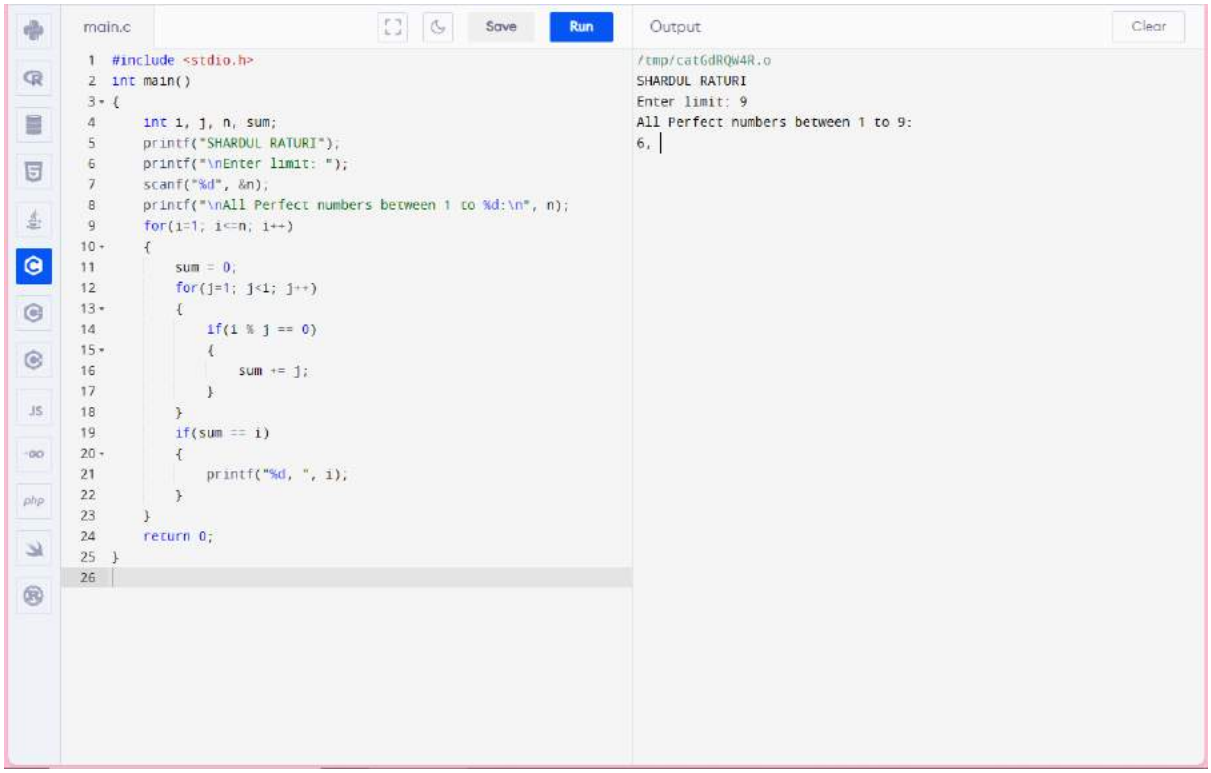
printf("SHARDUL RATURI");

printf("\nEnter limit: ");

scanf("%d", &n);

printf("\nAll Perfect numbers between 1 to %d:\n", n);

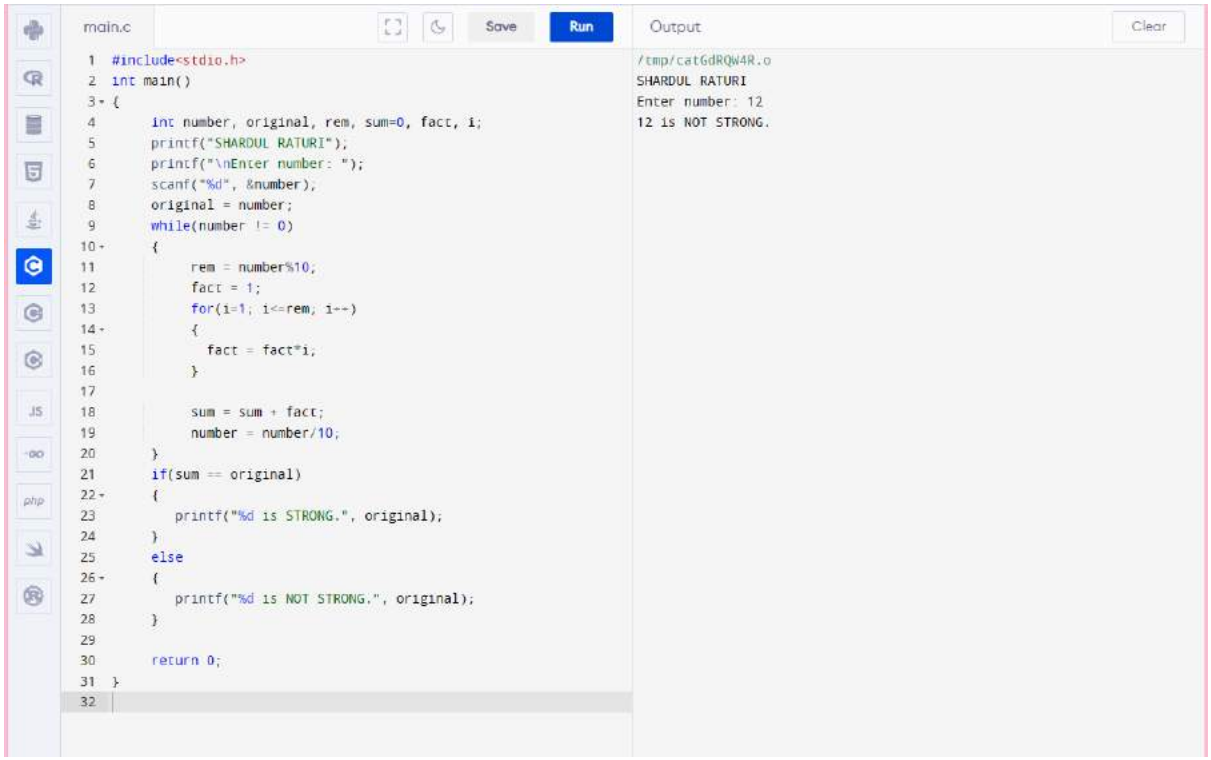
```
    for(i=1; i<=n; i++)
    {
        sum = 0;
        for(j=1; j<i; j++)
        {
            if(i % j == 0)
            {
                sum += j;
            }
        }
        if(sum == i)
        {
            printf("%d, ", i);
        }
    }
    return 0;
}
```



PROGRAM 54:- Write a C program to check whether a number is Strong number or not.

```
#include<stdio.h>
int main()
{
        int number, original, rem, sum=0, fact, i;
        printf("SHARDUL RATURI");
        printf("/nEnter number: ");
        scanf("%d", &number);
        original = number;
        while(number != 0)
        {
```

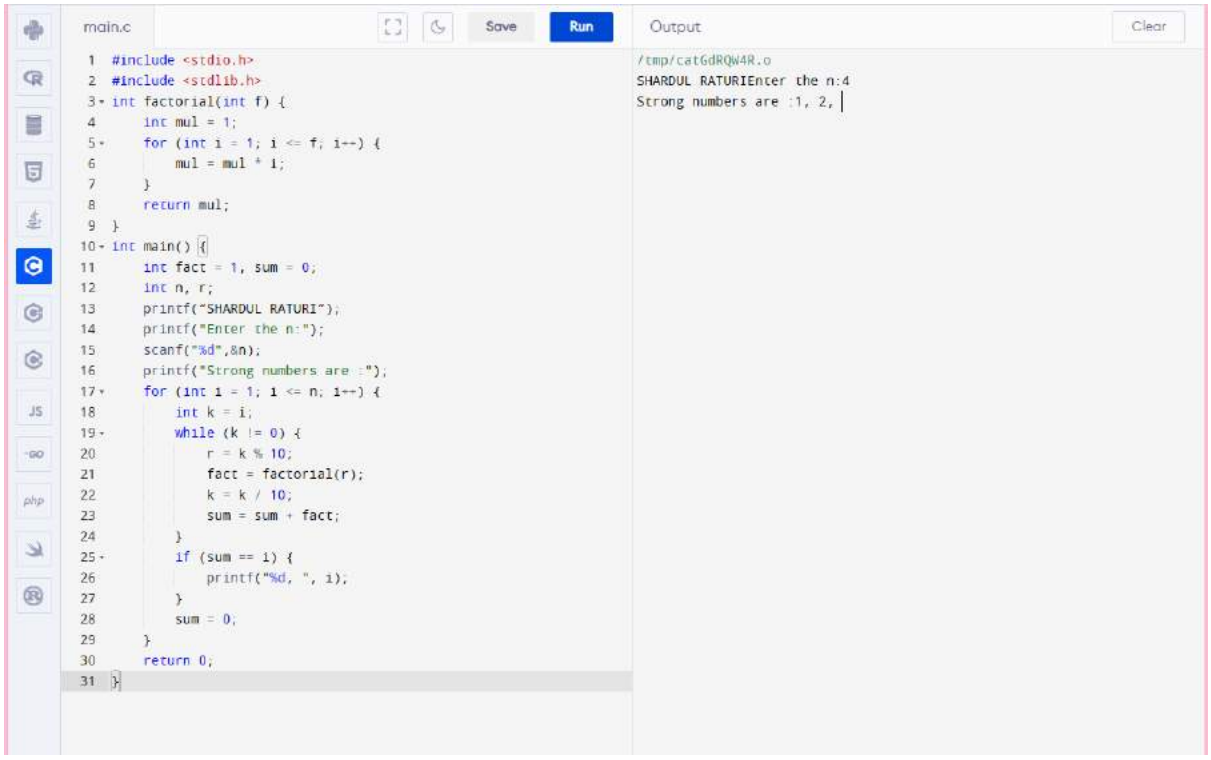
```
            rem = number%10;
            fact = 1;
            for(i=1; i<=rem; i++)
            {
                fact = fact*i;
            }

            sum = sum + fact;
            number = number/10;
        }
        if(sum == original)
        {
            printf("%d is STRONG.", original);
        }
        else
        {
            printf("%d is NOT STRONG.", original);
        }

        return 0;
}
```



PROGRAM 54:- TO PRINT ALL STRONG NUMBERS BETWEEN 1 to n

```
#include <stdio.h>
#include <stdlib.h>
int factorial(int f) {
   int mul = 1;
   for (int i = 1; i <= f; i++) {
      mul = mul * i;
   }
   return mul;
}
int main() {
   int fact = 1, sum = 0;
```

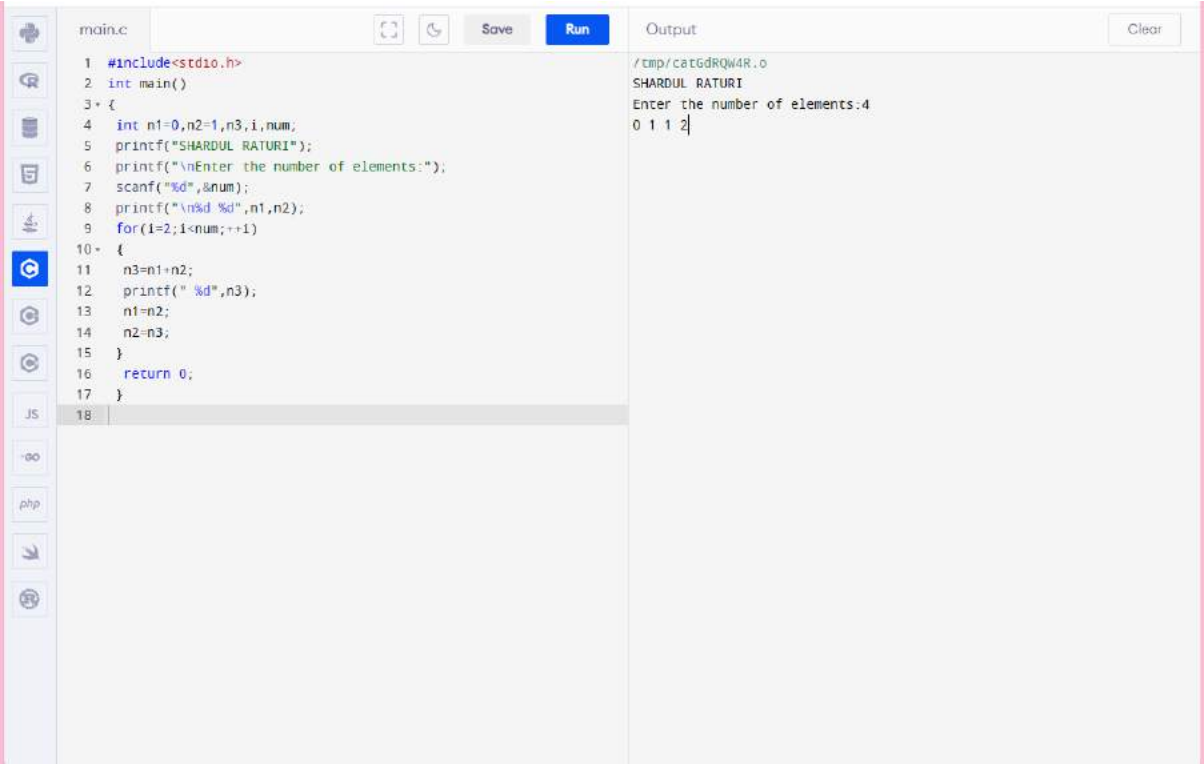
```
    int n, r;
    printf(“SHARDUL RATURI”);
    printf("Enter the n:");
    scanf("%d",&n);
    printf("Strong numbers are :");
    for (int i = 1; i <= n; i++) {
        int k = i;
        while (k != 0) {
            r = k % 10;
            fact = factorial(r);
            k = k / 10;
            sum = sum + fact;
        }
        if (sum == i) {
            printf("%d, ", i);
        }
        sum = 0;
    }
    return 0;
}
```



PROGRAM 55:- TO PRINT FIBONACCI SERIES UPTO n Terms

```
#include<stdio.h>
int main()
{
 int n1=0,n2=1,n3,i,num;
 printf("SHARDUL RATURI");
 printf("\nEnter the number of elements:");
 scanf("%d",&num);
 printf("\n%d %d",n1,n2);
 for(i=2;i<num;++i)
 {
  n3=n1+n2;
```

```
 printf(" %d",n3);
 n1=n2;
 n2=n3;
}
 return 0;
}
```

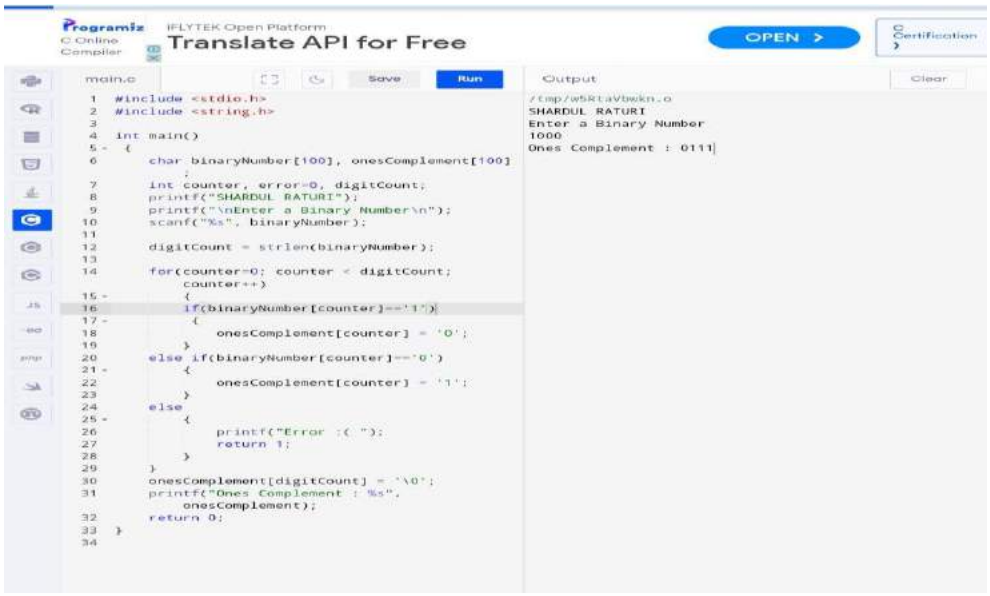


PROGRAM 56:- TO FIND ONEs COMPLEMENT OF A BINARY NUMBER.

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

```
int main()
 {
   char binaryNumber[100], onesComplement[100];
   int counter, error=0, digitCount;
   printf("SHARDUL RATURI");
   printf("\nEnter a Binary Number\n");
   scanf("%s", binaryNumber);

   digitCount = strlen(binaryNumber);

   for(counter=0; counter < digitCount; counter++)
      {
      if(binaryNumber[counter]=='1')
       {
          onesComplement[counter] = '0';
      }
   else if(binaryNumber[counter]=='0')
      {
          onesComplement[counter] = '1';
      }
   else
      {
          printf("Error :( ");
          return 1;
```

```
    }
  }
  onesComplement[digitCount] = '\0';
  printf("Ones Complement : %s", onesComplement);
  return 0;
}
```

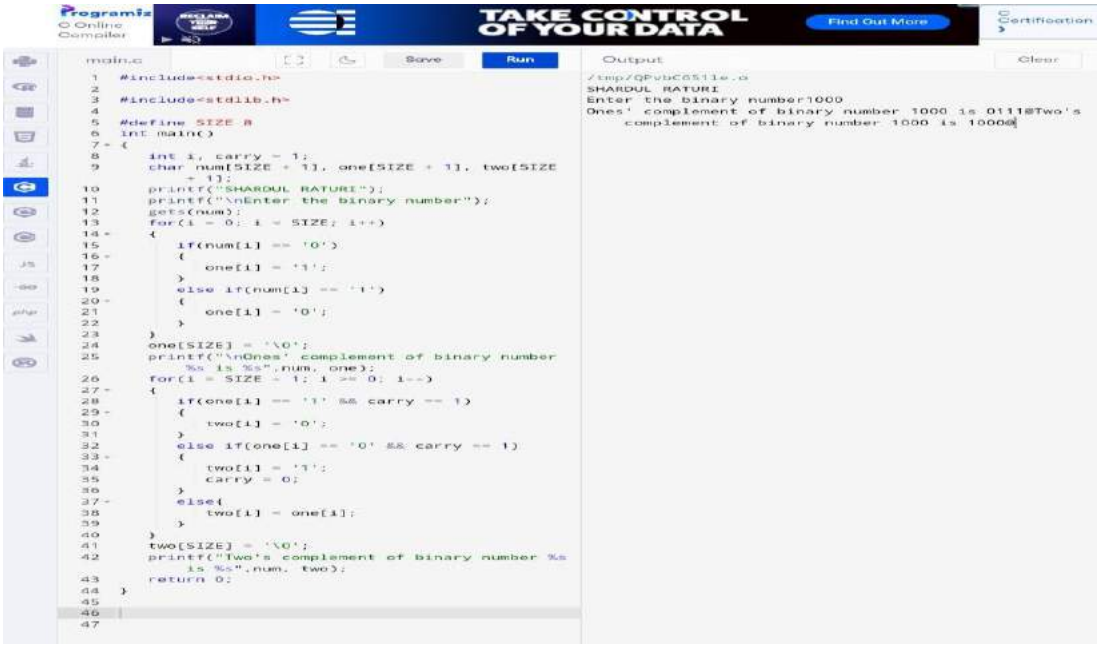


PROGAM 57:- TO FIND TWO's COMPLEMENT OF A BINARY NUMBER

```
#include<stdio.h>
#include<stdlib.h>
#define SIZE 8
int main()
{
  int i, carry = 1;
  char num[SIZE + 1], one[SIZE + 1], two[SIZE + 1];
```

```
  printf("SHARDUL RATURI");
  printf("\nEnter the binary number");
  gets(num);
  for(i = 0; i < SIZE; i++)
  {
    if(num[i] == '0')
    {
      one[i] = '1';
    }
    else if(num[i] == '1')
    {
      one[i] = '0';
    }
  }
  one[SIZE] = '\0';
  printf("\nOnes' complement of binary number %s is %s",num,
one);
  for(i = SIZE - 1; i >= 0; i--)
  {
    if(one[i] == '1' && carry == 1)
    {
      two[i] = '0';
    }
    else if(one[i] == '0' && carry == 1)
```

```
    {
      two[i] = '1';
      carry = 0;
    }
    else{
      two[i] = one[i];
    }
  }
  two[SIZE] = '\0';
  printf("Two's complement of binary number %s is %s",num, two);
  return 0;
}
```

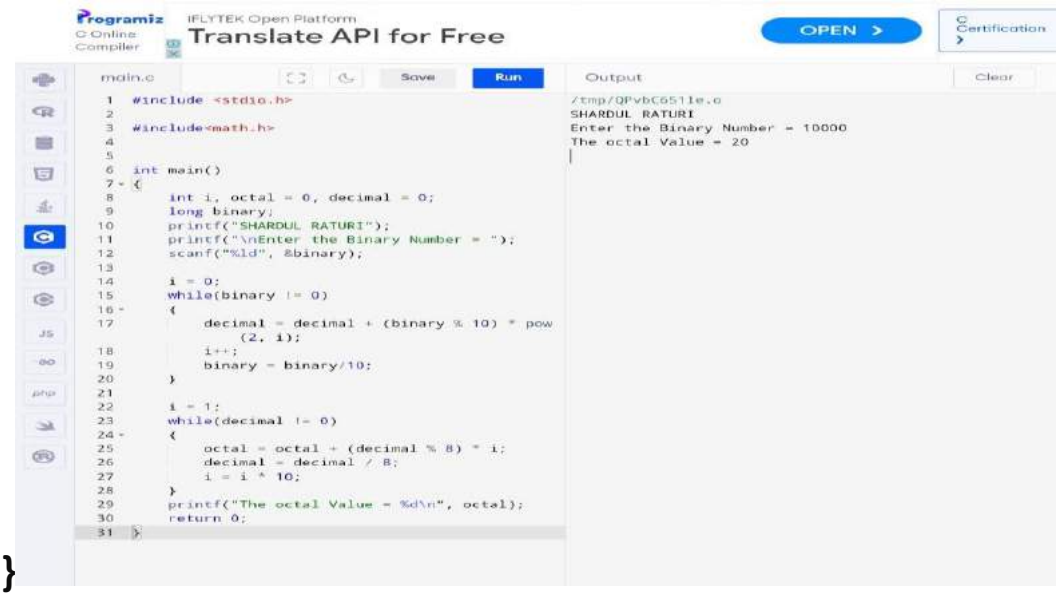


PROGRAM 58:- TO CONVERT BINARY NUMBER TO OCTAL NUMBER

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

```
#include<math.h>

int main()
{
   int i, octal = 0, decimal = 0;
   long binary;
   printf("SHARDUL RATURI");
   printf("\nEnter the Binary Number = ");
   scanf("%ld", &binary);

   i = 0;
   while(binary != 0)
   {
      decimal = decimal + (binary % 10) * pow(2, i);
      i++;
      binary = binary/10;
   }

   i = 1;
   while(decimal != 0)
   {
      octal = octal + (decimal % 8) * i;
      decimal = decimal / 8;
      i = i * 10;
```

```
    }
    printf("The octal Value = %d\n", octal);
    return 0;
```




```
}
```

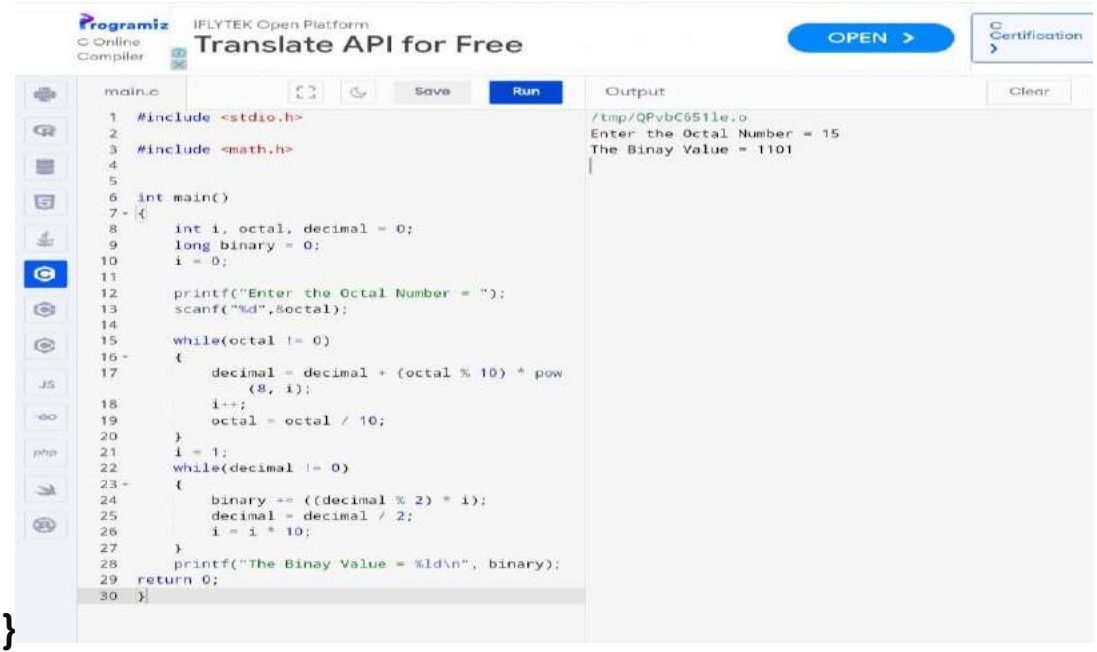
PROGRAM 59:- TO CONVERT BINARY NUMBER TO DECIMAL NUMBER

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

PROGRAM 62:- TO CONVERT OCTAL NUMBER TO BINARY NUMBER

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

int main()
{
   int i, octal, decimal = 0;
   long binary = 0;
   i = 0;

   printf("Enter the Octal Number = ");
   scanf("%d",&octal);

   while(octal != 0)
   {
      decimal = decimal + (octal % 10) * pow(8, i);
      i++;
```

```
    octal = octal / 10;
  }
  i = 1;
  while(decimal != 0)
  {
    binary += ((decimal % 2) * i);
    decimal = decimal / 2;
    i = i * 10;
  }
  printf("The Binay Value = %ld\n", binary);
```

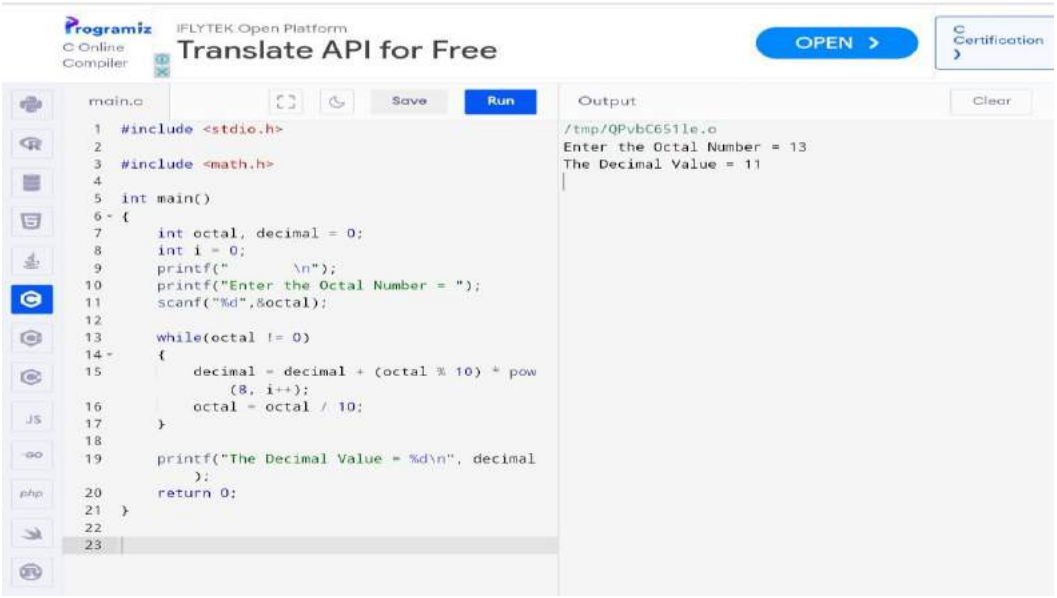



```
}
```

PROGRAM 63:- TO CONERT OCTAL NUMBER TO DECIMAL NUMBER

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

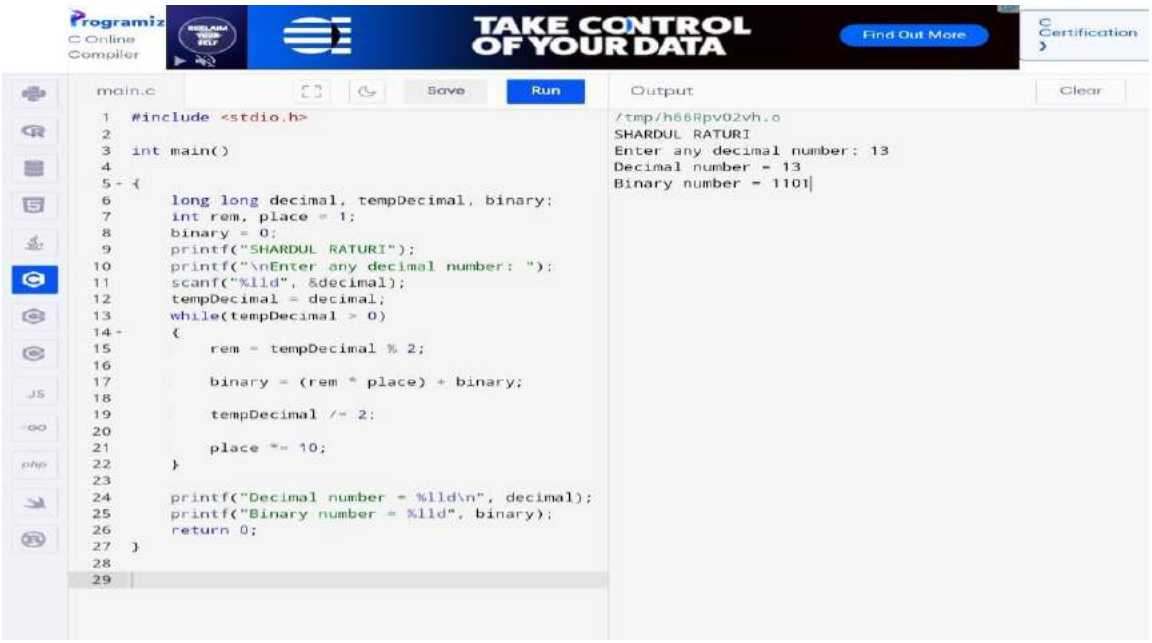
```
#include <math.h>
int main()
{
   int octal, decimal = 0;
   int i = 0;
   printf("       \n");
   printf("Enter the Octal Number = ");
   scanf("%d",&octal);

   while(octal != 0)
   {
      decimal = decimal + (octal % 10) * pow(8, i++);
      octal = octal / 10;
   }

   printf("The Decimal Value = %d\n", decimal);
   return 0;
}
```



PROGRAM 65:- TO CONVERT DECIMAL NUMBER TO BINARY NUMBER

```
#include <stdio.h>

int main()

{

   long long decimal, tempDecimal, binary;

   int rem, place = 1;

   binary = 0;

   printf("SHARDUL RATURI");

   printf("\nEnter any decimal number: ");

   scanf("%lld", &decimal);

   tempDecimal = decimal;

   while(tempDecimal > 0)

   {

      rem = tempDecimal % 2;
```

```
        binary = (rem * place) + binary;

        tempDecimal /= 2;

        place *= 10;
    }

    printf("Decimal number = %lld\n", decimal);
    printf("Binary number = %lld", binary);
    return 0;
}
```

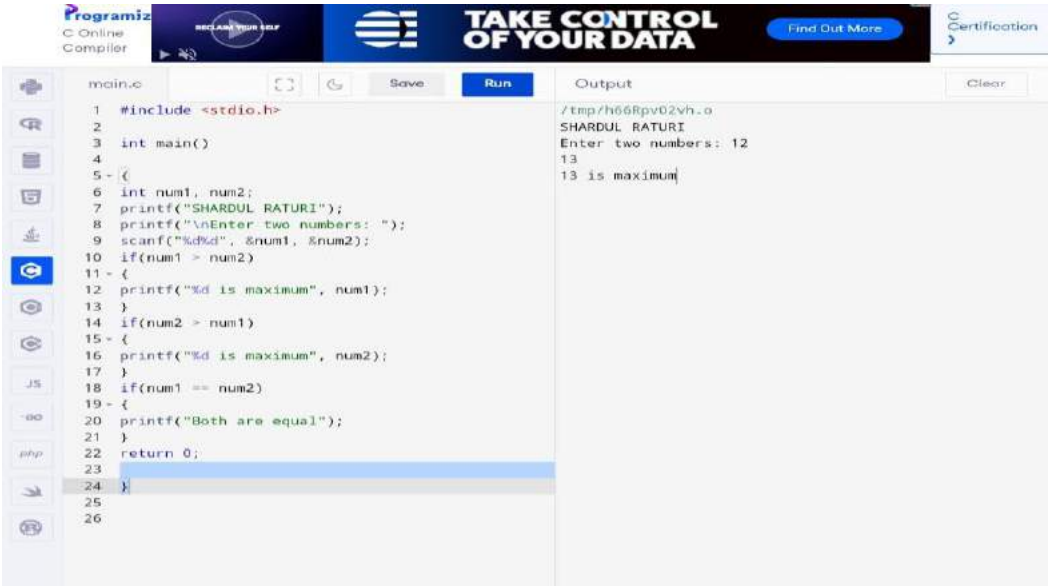


If...Else Exercises

PROGRAM 66. TO FIND MAXIMUM BETWEEN TWO NUMBERS.

```
#include <stdio.h>
int main()
{
int num1, num2;
printf("SHARDUL RATURI");
printf("\nEnter two numbers: ");
scanf("%d%d", &num1, &num2);
if(num1 > num2)
{
printf("%d is maximum", num1);
}
if(num2 > num1)
{
printf("%d is maximum", num2);
}
if(num1 == num2)
{
printf("Both are equal");
}
return 0;
```

}



PROGRAM 67. TO FIND MAXIMUM BETWEEN THREE NUMBERS.

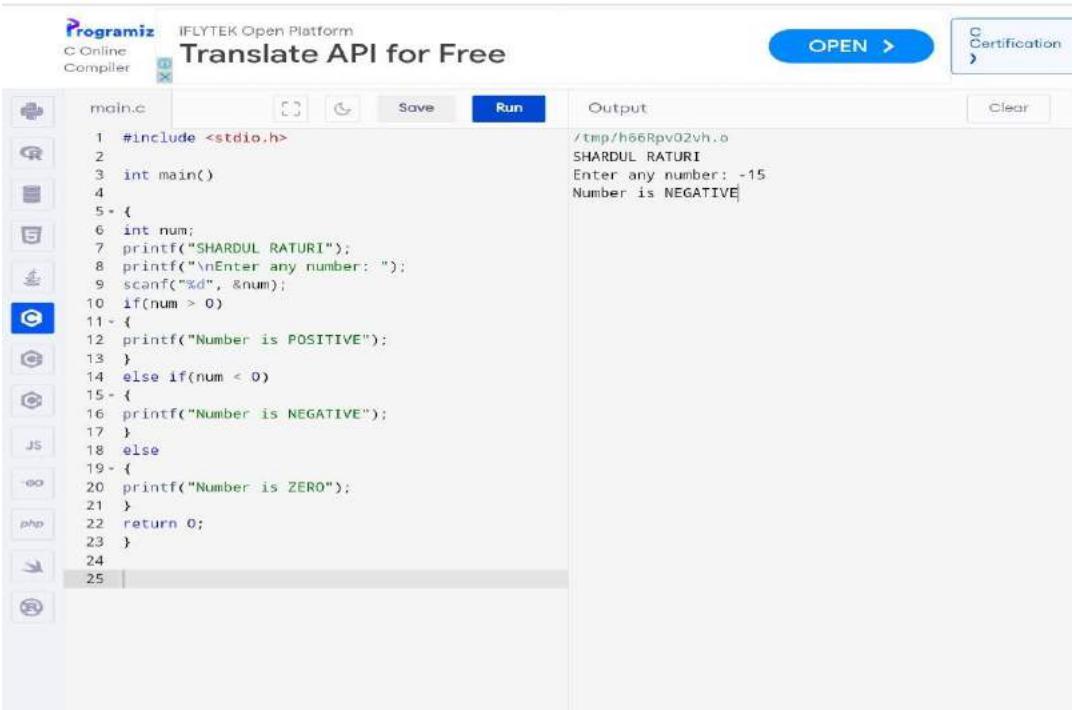
```
#include <stdio.h>
int main()
{
int num1, num2, num3, max;
printf("SHARDUL RATURI");
printf("\nEnter three numbers: ");
scanf("%d%d%d", &num1, &num2, &num3);
if(num1 > num2)
{
if(num1 > num3)
{
max = num1;
```

```
}
else
{
max = num3;
}
}
else
{
if(num2 > num3)
{
max = num2;
}
else
{
max = num3;
}
}
printf("Maximum among all three numbers = %d", max);
return 0;
}
```

PROGRAM 68. TO CHECK WHETHER A NUMBER IS NEGATIVE, POSITIVE OR ZERO.

```
#include <stdio.h>
int main()
{
int num;
printf("SHARDUL RATURI");
printf("\nEnter any number: ");
scanf("%d", &num);
if(num > 0)
{
printf("Number is POSITIVE");
}
else if(num < 0)
```

```
{
printf("Number is NEGATIVE");
}
else
{
printf("Number is ZERO");
}
return 0;
}
```



PROGRAM 69. TO CHECK WHETHER A NUMBER IS DIVISIBLE BY 5 AND 11 OR NOT.

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

```
{
int num;
printf("SHARDUL RATURI");
printf("\nEnter any number: ");
scanf("%d", &num);
if((num % 5 == 0) && (num % 11 == 0))
{
printf("Number is divisible by 5 and 11");
}
else
{
printf("Number is not divisible by 5 and 11");
}
return 0;
}
```

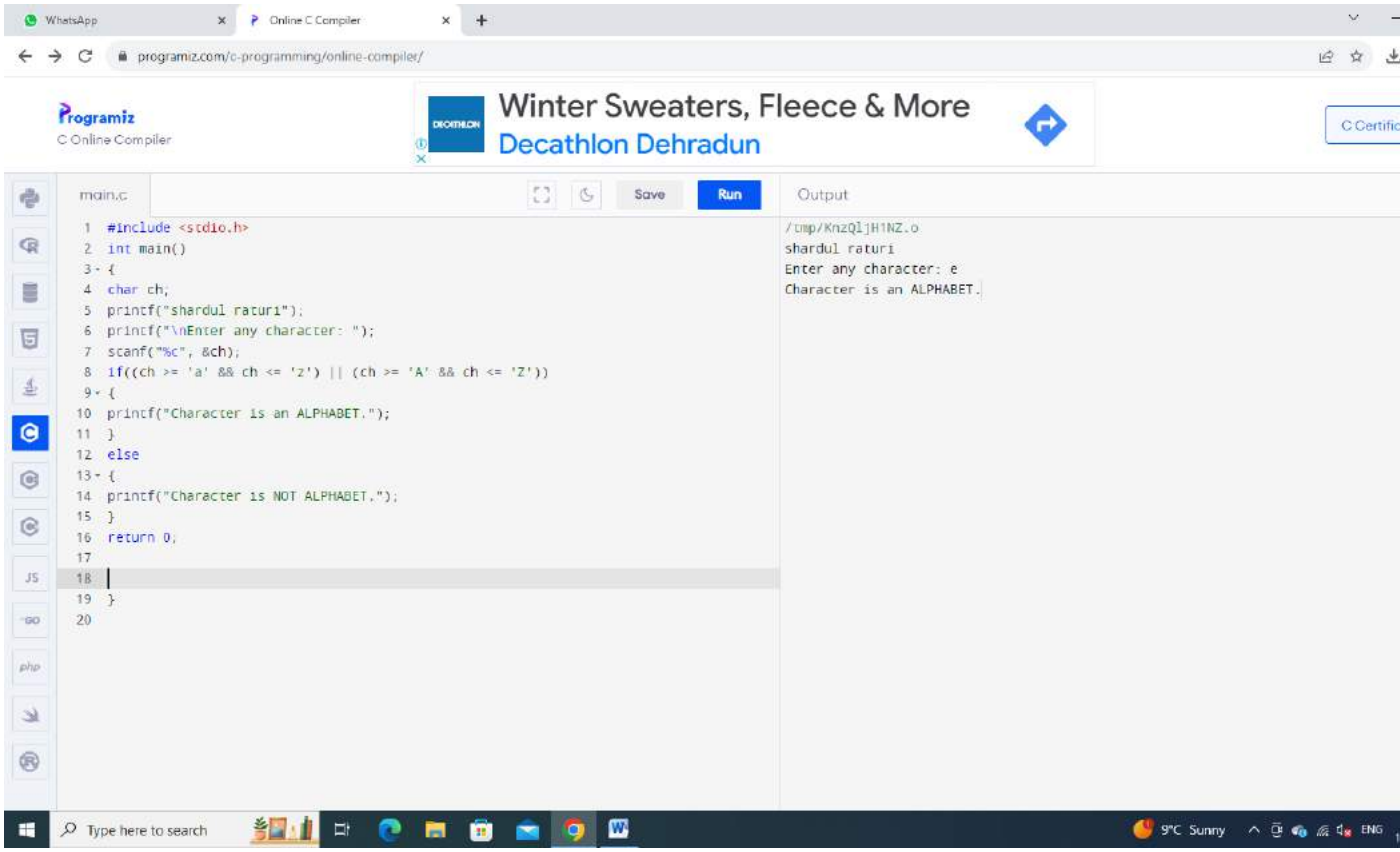
PROGRAM 70. TO CHECK WHETHER A NUMBER IS EVEN OR ODD.

```
#include <stdio.h>
int main()
{
int num;
printf("SHARDUL RATURI");
printf("\nEnter any number to check even or odd: ");
scanf("%d", &num);
if(num % 2 == 0)
{
printf("Number is Even.");
}
else
{
printf("Number is Odd.");
}
return 0;
}
```

TO CHECK WHETHER A CHARACTER IS ALPHABET OR NOT

```
#include <stdio.h>
int main()
{
char ch;
printf("shardul raturi");
printf("\nEnter any character: ");
```

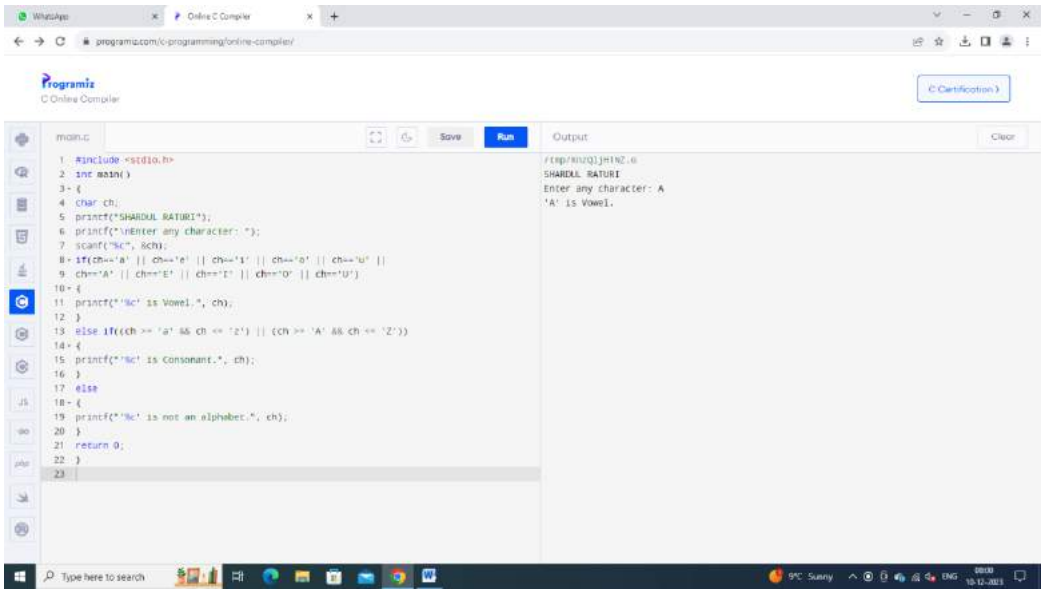
```
scanf("%c", &ch);
if((ch >= 'a' && ch <= 'z') || (ch >= 'A' &&
ch <= 'Z'))
{
printf("Character is an ALPHABET.");
}
else
{
printf("Character is NOT ALPHABET.");
}
return 0;



}
```



PROGRAM 73. TO INPUT ANY ALPHABET AND CHECK WHETHER IT IS VOWEL OR CONSONANT.

```
#include <stdio.h>

int main()

{

char ch;

printf("SHARDUL RATURI");

printf("\nEnter any character: ");

scanf("%c", &ch);

if(ch=='a' || ch=='e' || ch=='i' || ch=='o' || ch=='u' ||

ch=='A' || ch=='E' || ch=='I' || ch=='O' || ch=='U')
```

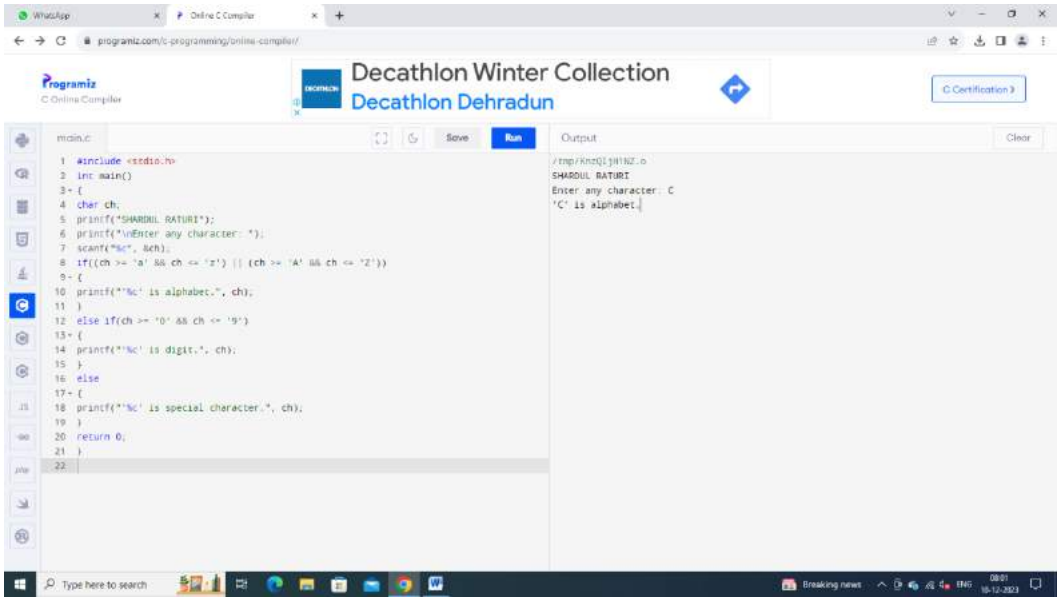
```
{
printf("'%c' is Vowel.", ch);
}
else if((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z'))
{
printf("'%c' is Consonant.", ch);
}
else
{
printf("'%c' is not an alphabet.", ch);
}
return 0;
}
```



PROGRAM 74. TO INPUT ANY CHARACTER AND CHECK WHETHER IT IS ALPHABET, DIGIT OR SPECIAL CHARACTER.

```
#include <stdio.h>
int main()
{
char ch;
printf("SHARDUL RATURI");
printf("\nEnter any character: ");
scanf("%c", &ch);
if((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z'))
{
printf("'%c' is alphabet.", ch);
}
else if(ch >= '0' && ch <= '9')
{
printf("'%c' is digit.", ch);
}
else
{
printf("'%c' is special character.", ch);
}
```

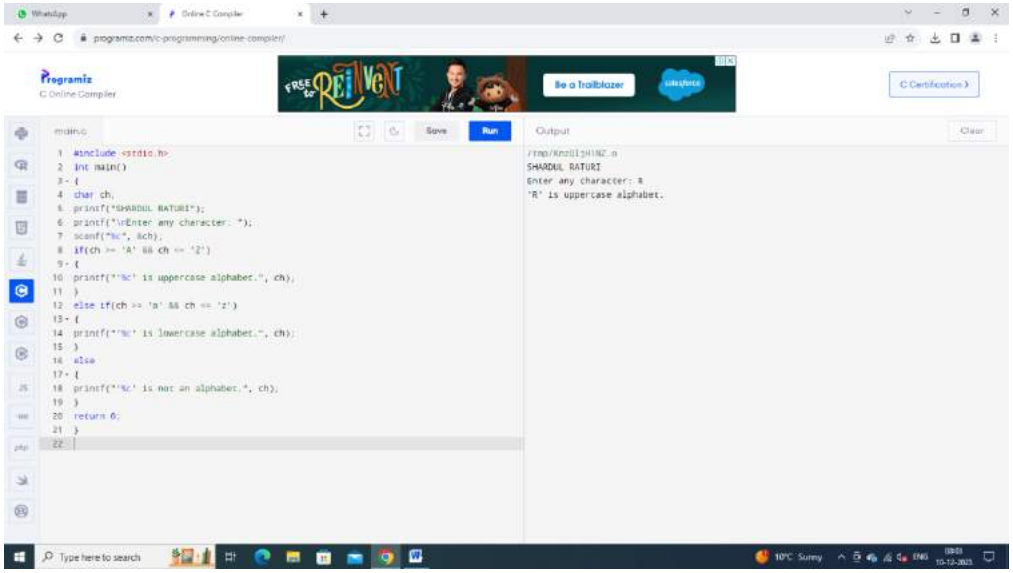
```
return 0;
}
```



PROGRAM 75. TO CHECK WHETHER A CHARACTER IS UPPERCASE OR LOWERCASE ALPHABET.

```
#include <stdio.h>
int main()
{
char ch;
printf("SHARDUL RATURI");
printf("\nEnter any character: ");
scanf("%c", &ch);
if(ch >= 'A' && ch <= 'Z')
{
printf("'%c' is uppercase alphabet.", ch);
```

```
}
else if(ch >= 'a' && ch <= 'z')
{
printf("'%c' is lowercase alphabet.", ch);
}
else
{
printf("'%c' is not an alphabet.", ch);
}
return 0;
}
```

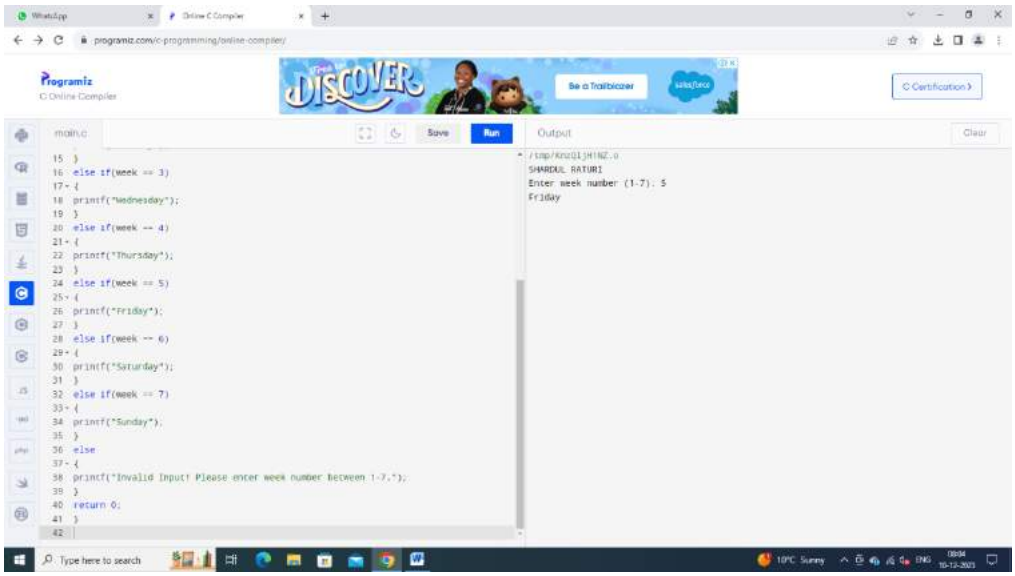


PROGRAM 76. TO INPUT WEEK NUMBER AND PRINT WEEK DAY.

```
#include <stdio.h>
int main()
{
```

```
int week;
printf("SHARDUL RATURI");
printf("\nEnter week number (1-7): ");
scanf("%d", &week);
if(week == 1)
{
printf("Monday");
}
else if(week == 2)
{
printf("Tuesday");
}
else if(week == 3)
{
printf("Wednesday");
}
else if(week == 4)
{
printf("Thursday");
}
else if(week == 5)
{
printf("Friday");
}
```

```
else if(week == 6)
{
printf("Saturday");
}
else if(week == 7)
{
printf("Sunday");
}
else
{
printf("Invalid Input! Please enter week number between 1-7.");
}
return 0;
}
```

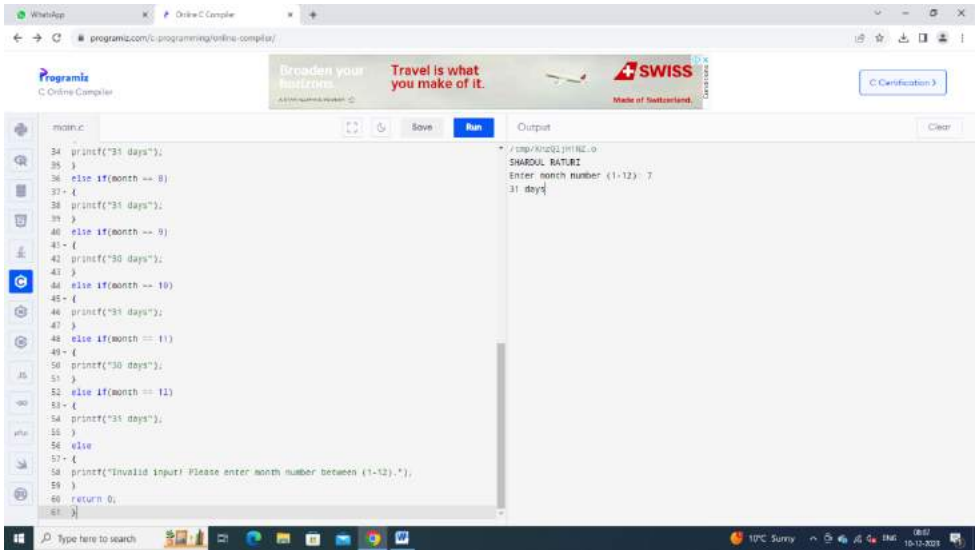


PROGRAM 77. TO INPUT MONTH NUMBER AND PRINT NUMBER OF DAYS IN THAT MONTH.

```
#include <stdio.h>
int main()
{
int month;
printf("SHARDUL RATURI");
printf("\nEnter month number (1-12): ");
scanf("%d", &month);
if(month == 1)
{
printf("31 days");
}
else if(month == 2)
{
printf("28 or 29 days");
}
else if(month == 3)
{
printf("31 days");
}
else if(month == 4)
```

```
{
printf("30 days");
}
else if(month == 5)
{
printf("31 days");
}
else if(month == 6)
{
printf("30 days");
}
else if(month == 7)
{
printf("31 days");
}
else if(month == 8)
{
printf("31 days");
}
else if(month == 9)
{
printf("30 days");
}
else if(month == 10)
```

```
{
printf("31 days");
}
else if(month == 11)
{
printf("30 days");
}
else if(month == 12)
{
printf("31 days");
}
else
{
printf("Invalid input! Please enter month number between (1-12).");
}
return 0;
}
```

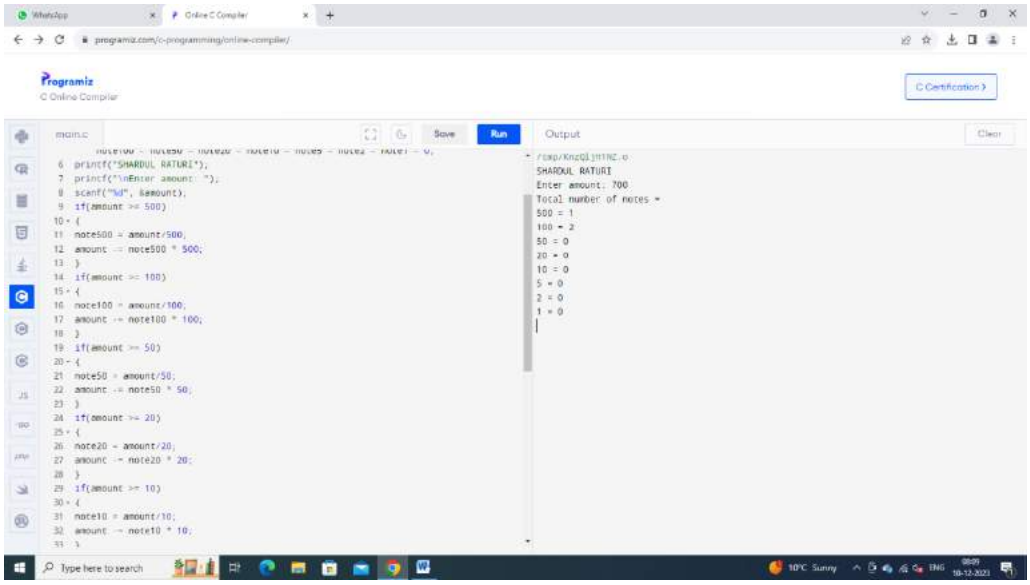


PROGRAM 78. TO COUNT TOTAL NUMBER OF NOTES IN GIVEN AMOUNT.

```
#include <stdio.h>

int main()

{

int amount;

int note500, note100, note50, note20, note10, note5, note2, note1;note500 = note100 = note50 = note20 = note10 = note5 = note2 = note1 = 0;

printf("SHARDUL RATURI");

printf("\nEnter amount: ");

scanf("%d", &amount);

if(amount >= 500)

{

note500 = amount/500;

amount -= note500 * 500;
```

```
}
if(amount >= 100)
{
note100 = amount/100;
amount -= note100 * 100;
}
if(amount >= 50)
{
note50 = amount/50;
amount -= note50 * 50;
}
if(amount >= 20)
{
note20 = amount/20;
amount -= note20 * 20;
}
if(amount >= 10)
{
note10 = amount/10;
amount -= note10 * 10;
}
if(amount >= 5)
{
note5 = amount/5;
```

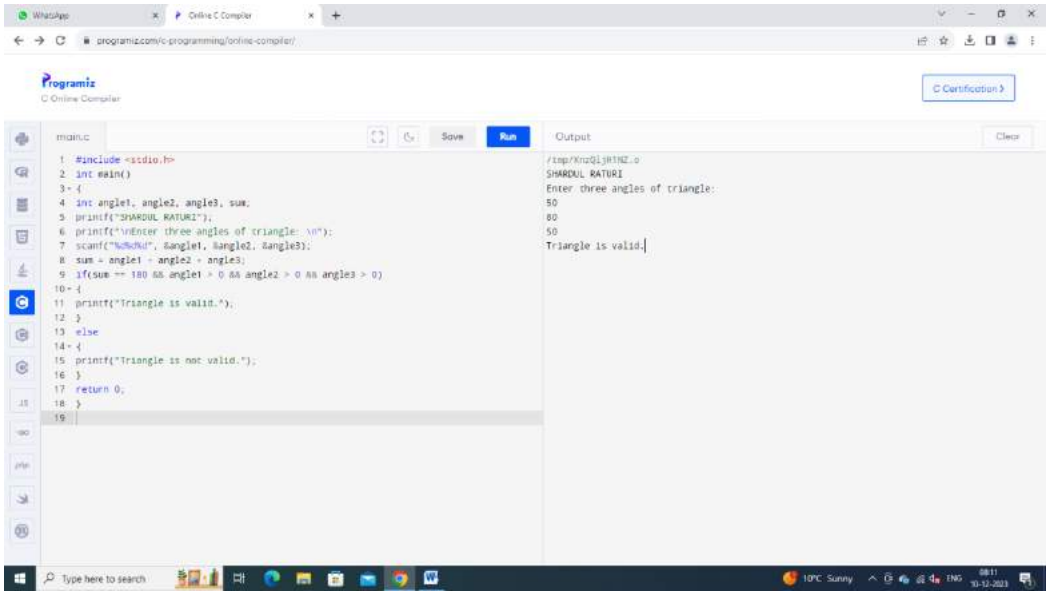
```
amount -= note5 * 5;
}
if(amount >= 2)
{
note2 = amount /2;
amount -= note2 * 2;
}
if(amount >= 1)
{
note1 = amount;
}
printf("Total number of notes = \n");
printf("500 = %d\n", note500);
printf("100 = %d\n", note100);
printf("50 = %d\n", note50);
printf("20 = %d\n", note20);
printf("10 = %d\n", note10);
printf("5 = %d\n", note5);
printf("2 = %d\n", note2);
printf("1 = %d\n", note1);
return 0;
}
```



PROGRAM 79. TO INPUT ANGLES OF A TRIANGLE AND CHECK WHETHER TRIANGLE IS VALID OR NOT.

```
#include <stdio.h>

int main()

{

int angle1, angle2, angle3, sum;

printf("SHARDUL RATURI");

printf("\nEnter three angles of triangle: \n");

scanf("%d%d%d", &angle1, &angle2, &angle3);

sum = angle1 + angle2 + angle3;

if(sum == 180 && angle1 > 0 && angle2 > 0 && angle3 > 0)

{

printf("Triangle is valid.");

}
```

```
else
{
printf("Triangle is not valid.");
}
return 0;
}
```

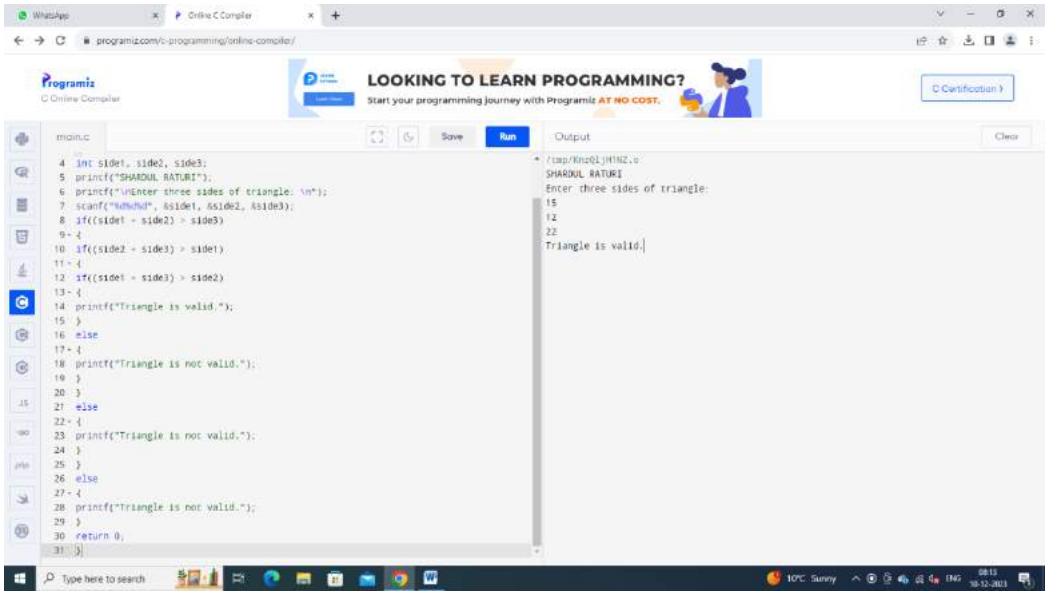


PROGRAM 80. TO INPUT ALL SIDES OF A TRIANGLE AND CHECK WHETHER TRIANGLE IS VALID OR NOT.

```
#include <stdio.h>
int main()
{
int side1, side2, side3;
printf("SHARDUL RATURI");
printf("\nEnter three sides of triangle: \n");
```

```
scanf("%d%d%d", &side1, &side2, &side3);
if((side1 + side2) > side3)
{
if((side2 + side3) > side1)
{
if((side1 + side3) > side2)
{
printf("Triangle is valid.");
}
else
{
printf("Triangle is not valid.");
}
}
else
{
printf("Triangle is not valid.");
}
}
else
{
printf("Triangle is not valid.");
}
return 0;
```

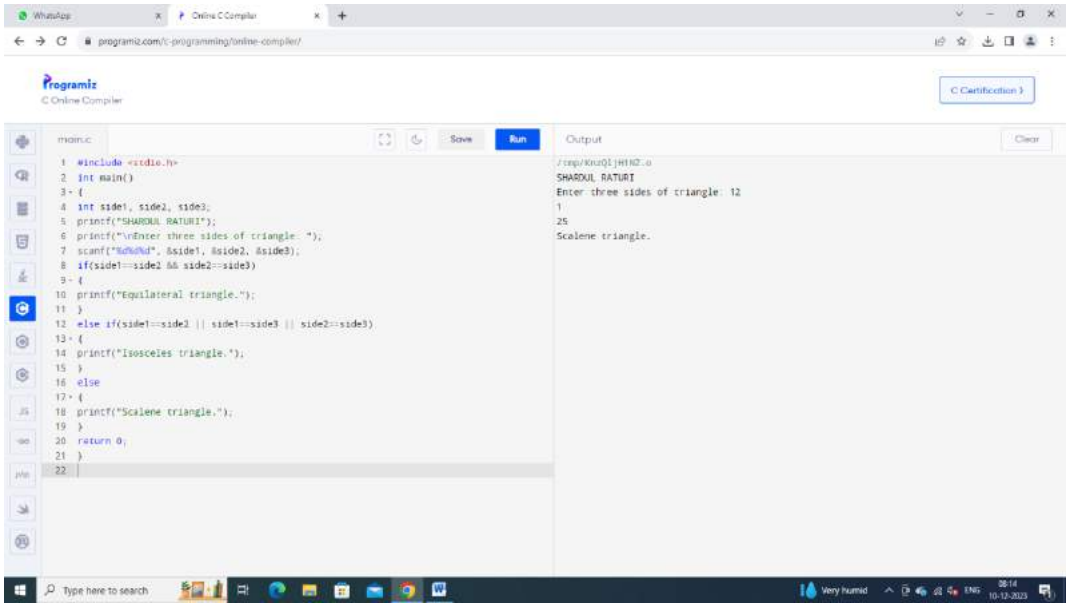
}



PROGRAM 81. TO CHECK WHETHER THE TRIANGLE IS EQUILATERAL, ISOSCELES OR SCALENE TRIANGLE.

```
#include <stdio.h>
int main()
{
int side1, side2, side3;
printf("SHARDUL RATURI");
printf("\nEnter three sides of triangle: ");
scanf("%d%d%d", &side1, &side2, &side3);
if(side1==side2 && side2==side3)
{
printf("Equilateral triangle.");
}
```

```
else if(side1==side2 || side1==side3 || side2==side3)
{
printf("Isosceles triangle.");
}
else
{
printf("Scalene triangle.");
}
return 0;
}
```

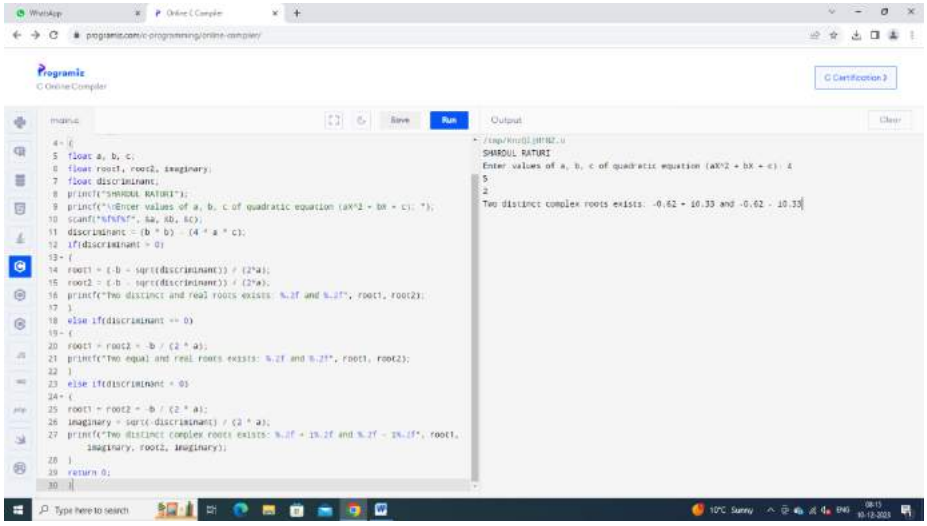


PROGRAM 82. TO FIND ALL ROOTS OF A QUADRATIC EQUATION.

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

```
{
float a, b, c;
float root1, root2, imaginary;
float discriminant;
printf("SHARDUL RATURI");
printf("\nEnter values of a, b, c of quadratic equation (aX^2 + bX + c): ");
scanf("%f%f%f", &a, &b, &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 and real roots exists: %.2f and %.2f", root1, root2);
}
else if(discriminant == 0)
{
root1 = root2 = -b / (2 * a);
printf("Two equal and real roots exists: %.2f and %.2f", root1, root2);
}
else if(discriminant < 0)
{
root1 = root2 = -b / (2 * a);
```

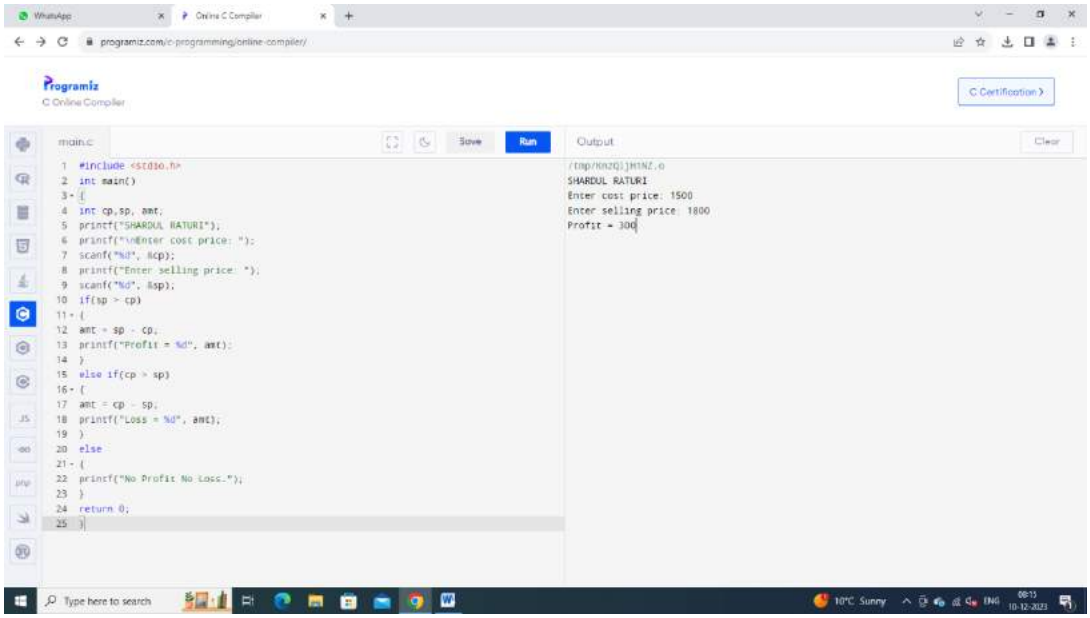
```
imaginary = sqrt(-discriminant) / (2 * a);

printf("Two distinct complex roots exists: %.2f + i%.2f and %.2f - i%.2f", root1, imaginary, root2, imaginary);

}

return 0;

}
```



PROGRAM 83. TO CALCULATE PROFIT OR LOSS.

```
#include <stdio.h>

int main()

{

int cp,sp, amt;

printf("SHARDUL RATURI");

printf("\nEnter cost price: ");

scanf("%d", &cp);

printf("Enter selling price: ");
```

```
scanf("%d", &sp);
if(sp > cp)
{
amt = sp - cp;
printf("Profit = %d", amt);
}
else if(cp > sp)
{
amt = cp - sp;
printf("Loss = %d", amt);
}
else
{
printf("No Profit No Loss.");
}
return 0;
}
```



PROGRAM 84. TO INPUT MARKS OF FIVE SUBJECTS PHYSICS, CHEMISTRY, BIOLOGY, MATHEMATICS AND COMPUTER. CALCULATE PERCENTAGE AND GRADE ACCORDING TO FOLLOWING:

PERCENTAGE >= 90% : GRADE A

PERCENTAGE >= 80% : GRADE B

PERCENTAGE >= 70% : GRADE C

PERCENTAGE >= 60% : GRADE D

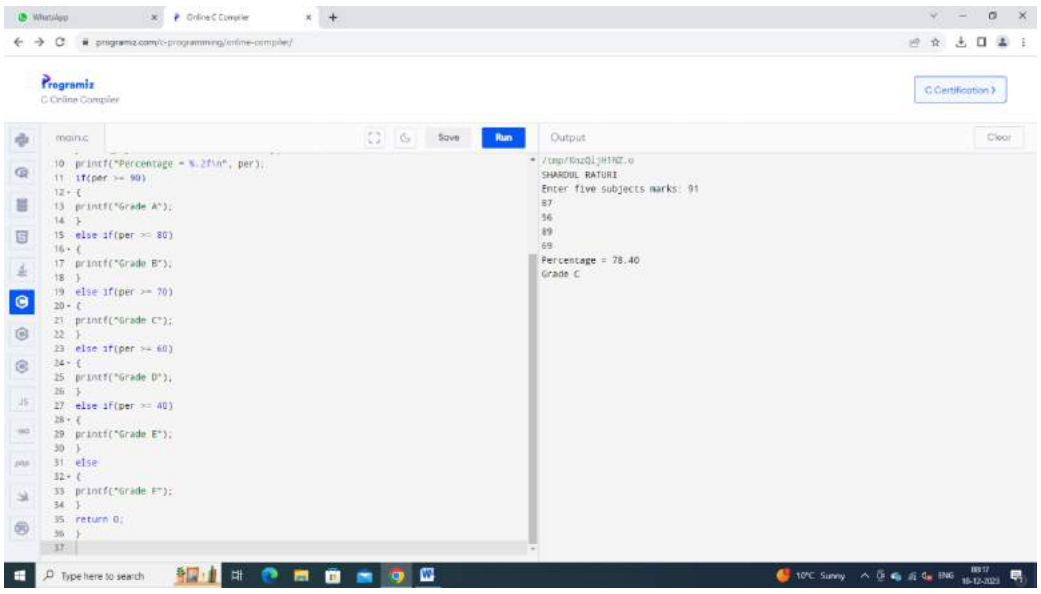
PERCENTAGE >= 40% : GRADE E

PERCENTAGE < 40% : GRADE F

#include <stdio.h>

```
int main()
{
int phy, chem, bio, math, comp;
float per;
printf("SHARDUL RATURI");
printf("\nEnter five subjects marks: ");
scanf("%d%d%d%d%d", &phy, &chem, &bio, &math, &comp);
per = (phy + chem + bio + math + comp) / 5.0;
printf("Percentage = %.2f\n", per);
if(per >= 90)
{
printf("Grade A");
}
else if(per >= 80)
{
printf("Grade B");
}
else if(per >= 70)
{
printf("Grade C");
}
else if(per >= 60)
{
printf("Grade D");
```

```
}
else if(per >= 40)
{
printf("Grade E");
}
else
{
printf("Grade F");
}
return 0;
}
```



PROGRAM 85. TO INPUT BASIC SALARY OF AN EMPLOYEE AND CALCULATE ITS GROSS SALARY ACCORDING TO FOLLOWING:

BASIC SALARY <= 10000 : HRA = 20%,

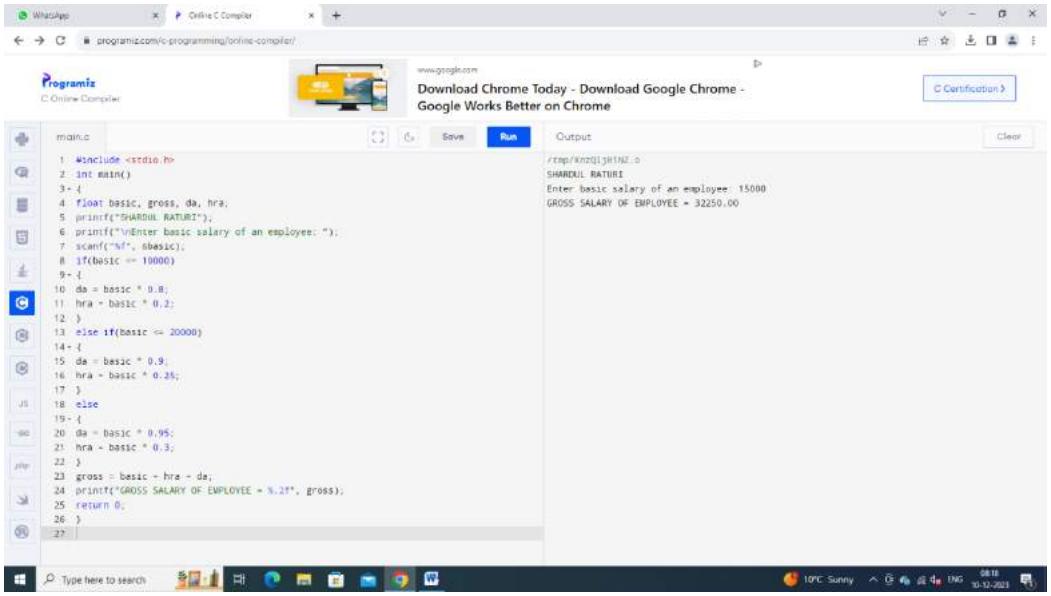
DA = 80% BASIC SALARY <= 20000 : HRA = 25%,

DA = 90% BASIC SALARY > 20000 : HRA = 30%,

DA = 95%

```
#include <stdio.h>
int main()
{
float basic, gross, da, hra;
printf("SHARDUL RATURI");
printf("\nEnter basic salary of an employee: ");
scanf("%f", &basic);
if(basic <= 10000)
{
da = basic * 0.8;
hra = basic * 0.2;
}
else if(basic <= 20000)
{
da = basic * 0.9;
hra = basic * 0.25;
```

```
}
else
{
da = basic * 0.95;
hra = basic * 0.3;
}
gross = basic + hra + da;
printf("GROSS SALARY OF EMPLOYEE = %.2f", gross);
return 0;
}
```



PROGRAM 86. TO INPUT ELECTRICITY UNIT CHARGES AND CALCULATE TOTAL ELECTRICITY BILL ACCORDING TO THE GIVEN CONDITION:

FOR FIRST 50 UNITS RS. 0.50/UNIT

FOR NEXT 100 UNITS RS. 0.75/UNIT

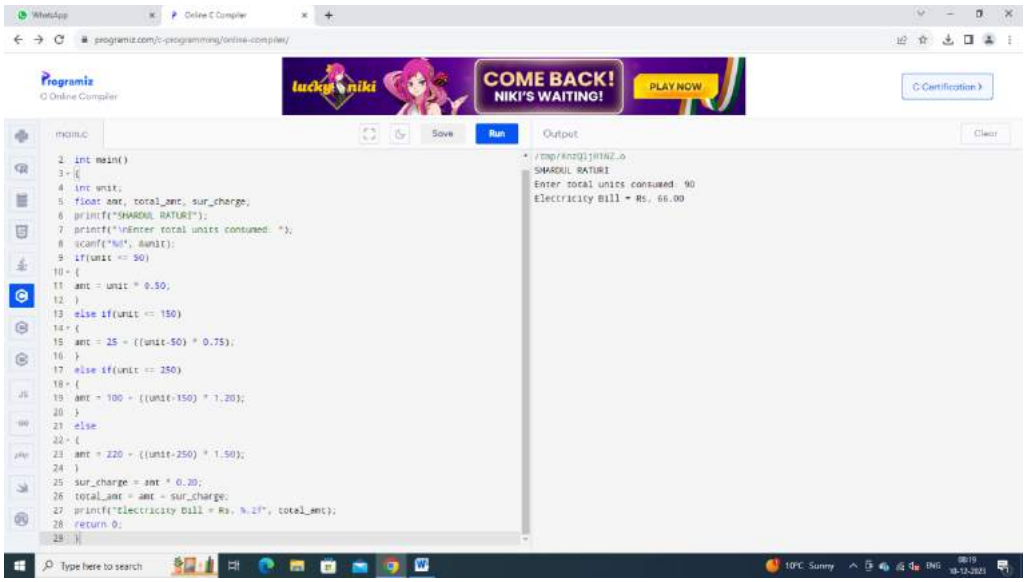
FOR NEXT 100 UNITS RS. 1.20/UNIT

FOR UNIT ABOVE 250 RS. 1.50/UNIT

AN ADDITIONAL SURCHARGE OF 20% IS ADDED TO THE BILL

```
#include <stdio.h>
int main()
{
int unit;
float amt, total_amt, sur_charge;
printf("SHARDUL RATURI");
printf("\nEnter total units consumed: ");
scanf("%d", &unit);
if(unit <= 50)
{
amt = unit * 0.50;
}
else if(unit <= 150)
{
amt = 25 + ((unit-50) * 0.75);
}
else if(unit <= 250)
```

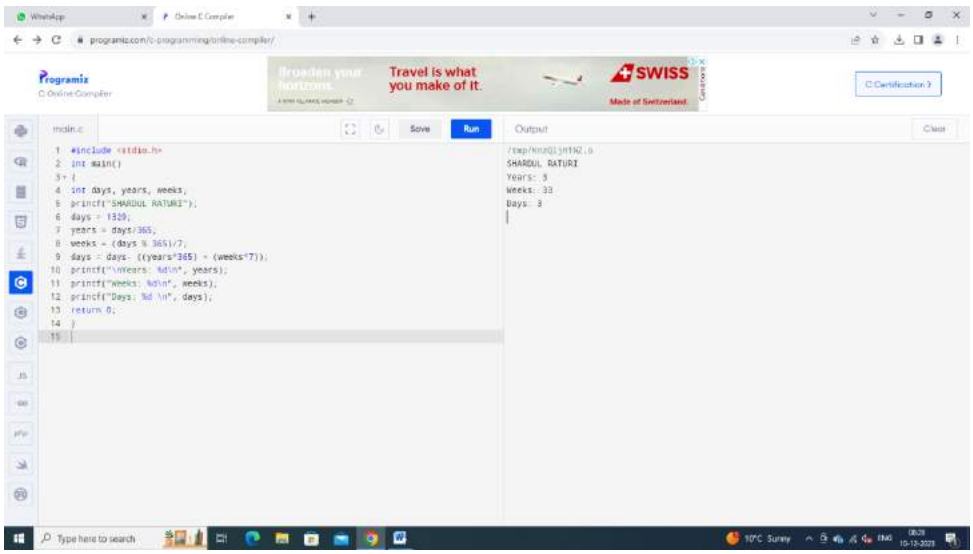
```
{
amt = 100 + ((unit-150) * 1.20);
}
else
{
amt = 220 + ((unit-250) * 1.50);
}
sur_charge = amt * 0.20;
total_amt = amt + sur_charge;
printf("Electricity Bill = Rs. %.2f", total_amt);
return 0;
}
```



PROGRAM 87.TO CONVERT SPECIFIED DAYS INTO YEARS, WEEKS AND DAYS.

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

```
int main()
{
int days, years, weeks;
printf("SHARDUL RATURI");
days = 1329;
years = days/365;
weeks = (days % 365)/7;
days = days- ((years*365) + (weeks*7));
printf("\nYears: %d\n", years);
printf("Weeks: %d\n", weeks);
printf("Days: %d \n", days);
return 0;
}
```

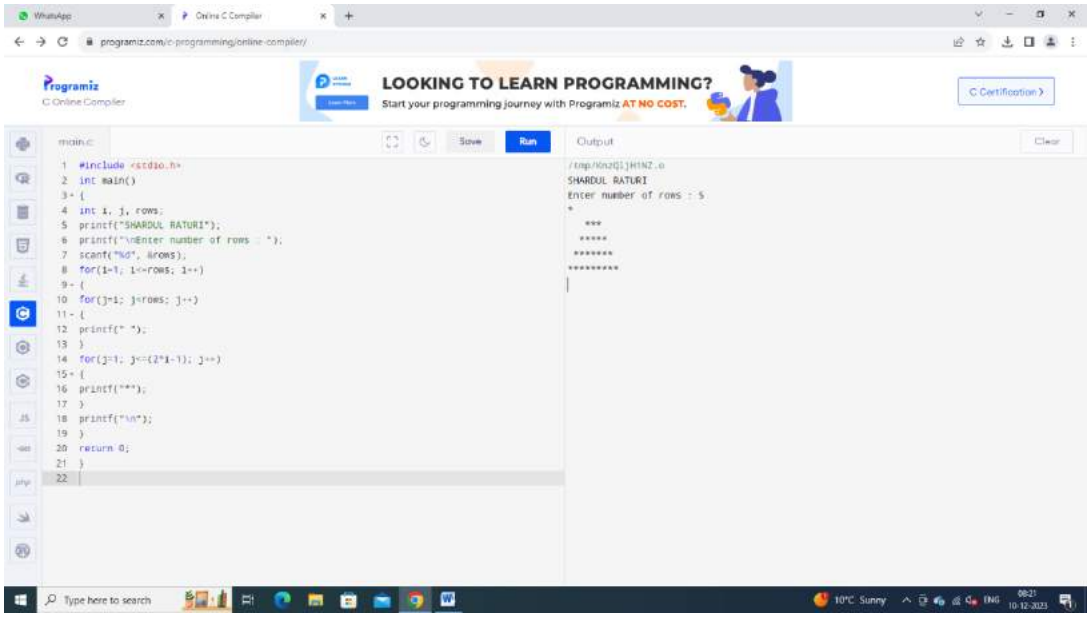


Pattern Exercises

STAR PATTERN PROGRAMS

PROGRAM 88. PYRAMID STAR PATTERN

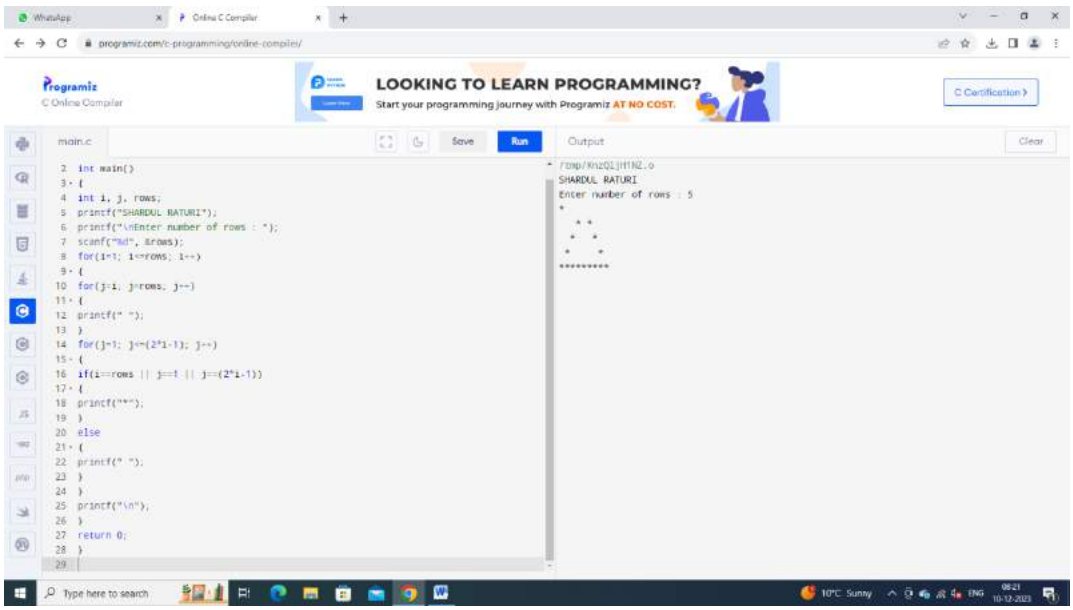
```
#include <stdio.h>
int main()
{
int i, j, rows;
printf("SHARDUL RATURI");
printf("\nEnter number of rows : ");
scanf("%d", &rows);
for(i=1; i<=rows; i++)
{
for(j=i; j<rows; j++)
{
printf(" ");
}
for(j=1; j<=(2*i-1); j++)
{
printf("*");
}
printf("\n");
}
return 0;
}
```



PROGRAM 89.HOLLOW PYRAMID STAR PATTERN

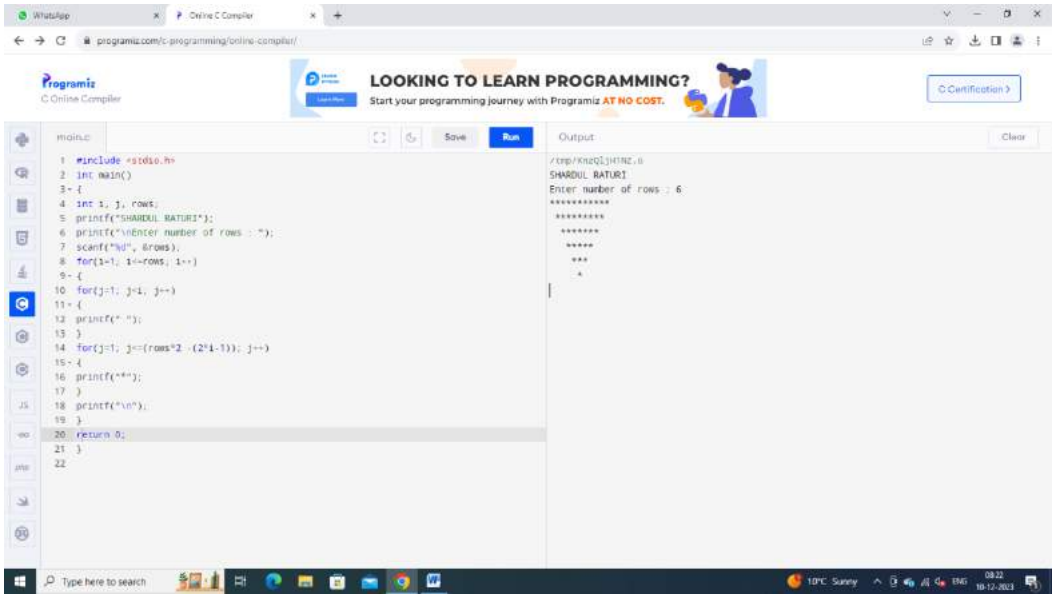
```
#include <stdio.h>

int main()

{

int i, j, rows;

printf("SHARDUL RATURI");

printf("\nEnter number of rows : ");

scanf("%d", &rows);

for(i=1; i<=rows; i++)

{

for(j=i; j<rows; j++)

{

printf(" ");

}
```

```
for(j=1; j<=(2*i-1); j++)
{
if(i==rows || j==1 || j==(2*i-1))
{
printf("*");
}
else
{
printf(" ");
}
}
printf("\n");
}
return 0;
}
```



PROGRAM 90. INVERTED PYRAMID STAR PATTERN

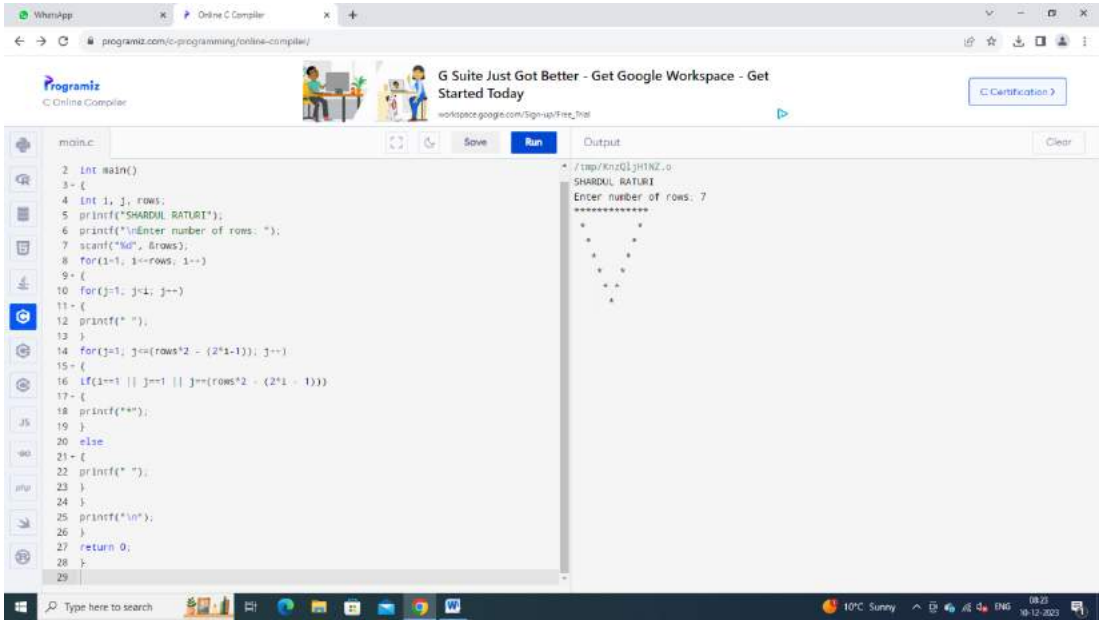
```
#include <stdio.h>
int main()
{
int i, j, rows;
printf("SHARDUL RATURI");
printf("\nEnter number of rows : ");
scanf("%d", &rows);
for(i=1; i<=rows; i++)
{
for(j=1; j<i; j++)
{
printf(" ");
}
for(j=1; j<=(rows*2 -(2*i-1)); j++)
{
printf("*");
}
printf("\n");
}
return 0;
}
```



PROGRAM 91.HOLLOW INVERTED STAR PATTERN

```
#include <stdio.h>

int main()

{

int i, j, rows;

printf("SHARDUL RATURI");

printf("\nEnter number of rows: ");

scanf("%d", &rows);

for(i=1; i<=rows; i++)

{

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

{

printf(" ");

}
```

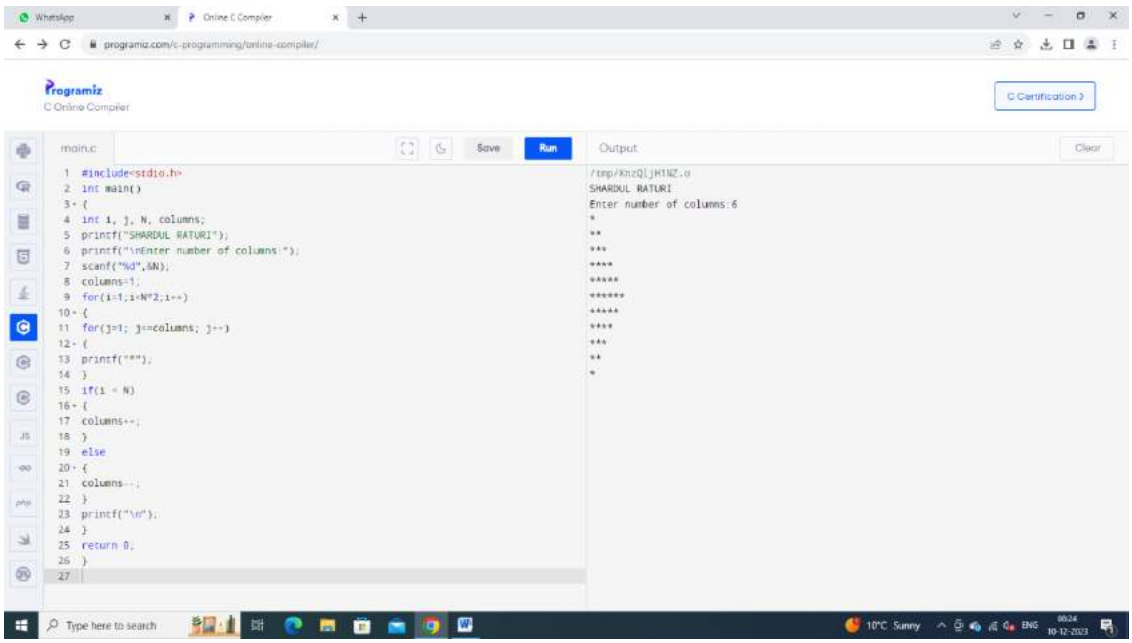
```
for(j=1; j<=(rows*2 - (2*i-1)); j++)
{
if(i==1 || j==1 || j==(rows*2 - (2*i - 1)))
{
printf("*");
}
else
{
printf(" ");
}
}
printf("\n");
}
return 0;
}
```



PROGRAM 92.HALF DIAMOND STAR PATTERN

```
#include<stdio.h>
int main()
{
int i, j, N, columns;
printf("SHARDUL RATURI");
printf("\nEnter number of columns:");
scanf("%d",&N);
columns=1;
for(i=1;i<N*2;i++)
{
for(j=1; j<=columns; j++)
{
printf("*");
}
if(i < N)
{
columns++;
}
else
{
columns--;
```

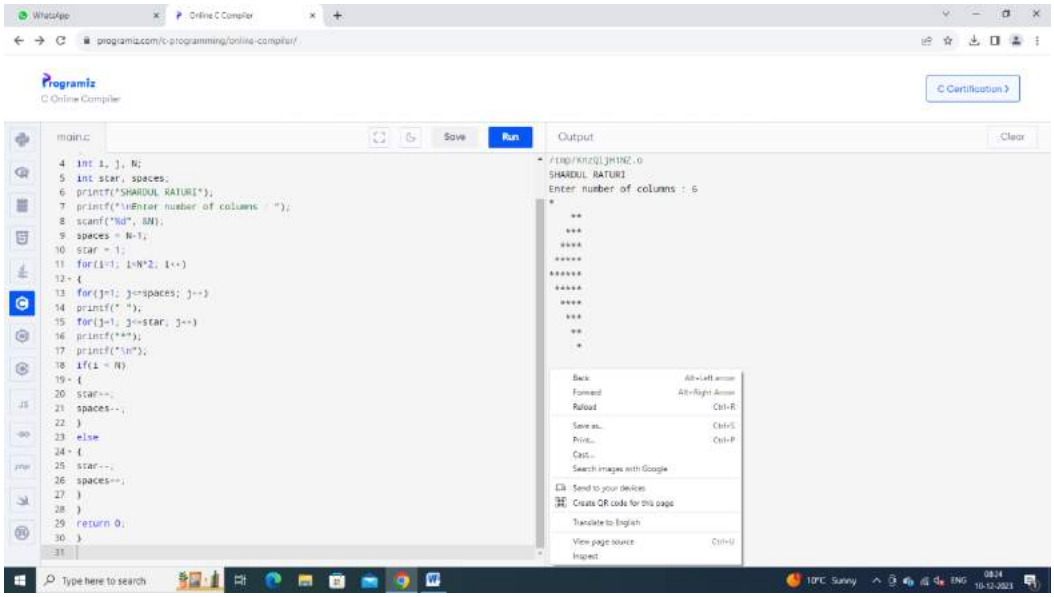
```
}
printf("\n");
}
return 0;
}
```



PROGRAM 93.MIRRORED HALF DIAMOND STAR PATTERN

```
#include <stdio.h>
int main()
{
int i, j, N;
int star, spaces;
printf("SHARDUL RATURI");
printf("\nEnter number of columns : ");
scanf("%d", &N);
```

```
spaces = N-1;
star = 1;
for(i=1; i<N*2; i++)
{
for(j=1; j<=spaces; j++)
printf(" ");
for(j=1; j<=star; j++)
printf("*");
printf("\n");
if(i < N)
{
star++;
spaces--;
}
else
{
star--;
spaces++;
}
}
return 0;
}
```



NUMBER PATTERN PROGRAMS –

PROGRAM 94. NUMBER PATTERN 1

11111

11111

11111

11111

11111

#include <stdio.h>

int main()

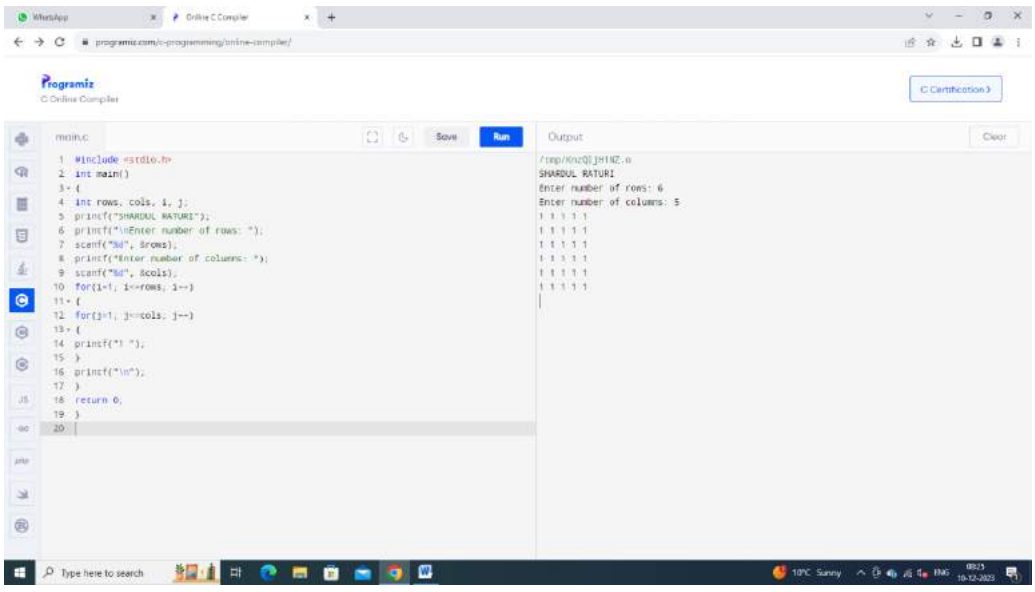
{

int rows, cols, i, j;

printf("SHARDUL RATURI");

printf("\nEnter number of rows: ");

```
scanf("%d", &rows);
printf("Enter number of columns: ");
scanf("%d", &cols);
for(i=1; i<=rows; i++)
{
for(j=1; j<=cols; j++)
{
printf("1 ");
}
printf("\n");
}
return 0;
}
```



PROGRAM 95.NUMBER PATTERN 2

11111

00000

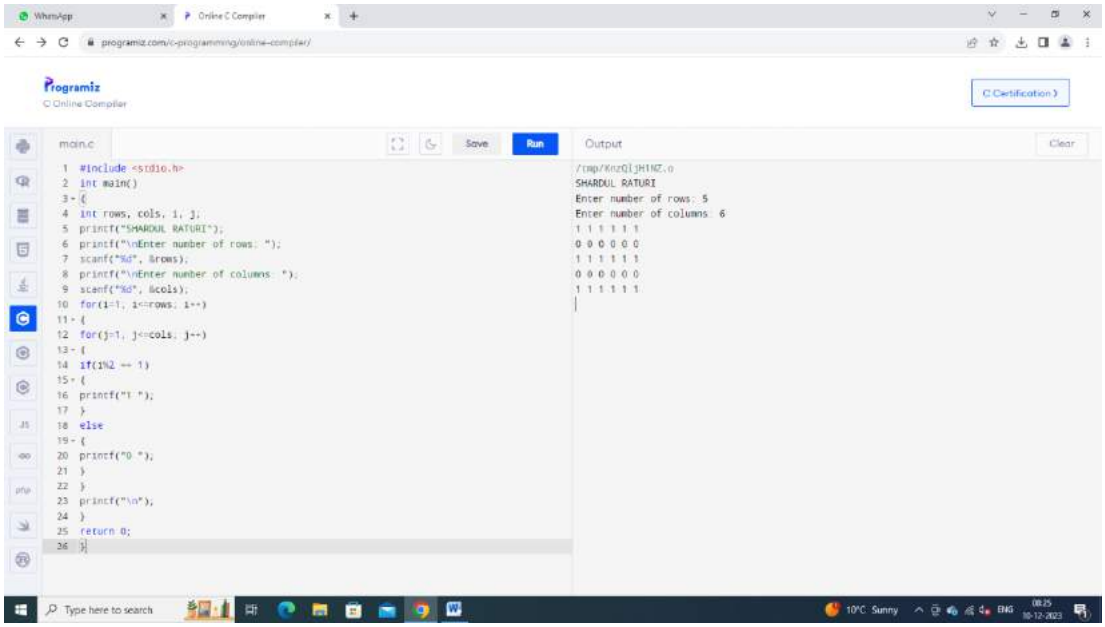
11111

00000

11111

```
#include <stdio.h>
int main()
{
int rows, cols, i, j;
printf("SHARDUL RATURI");
printf("\nEnter number of rows: ");
scanf("%d", &rows);
printf("\nEnter number of columns: ");
scanf("%d", &cols);
for(i=1; i<=rows; i++)
{
for(j=1; j<=cols; j++)
{
if(i%2 == 1)
{
printf("1 ");
}
else
```

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



PROGRAM 96.NUMBER PATTERN 3

01010

01010

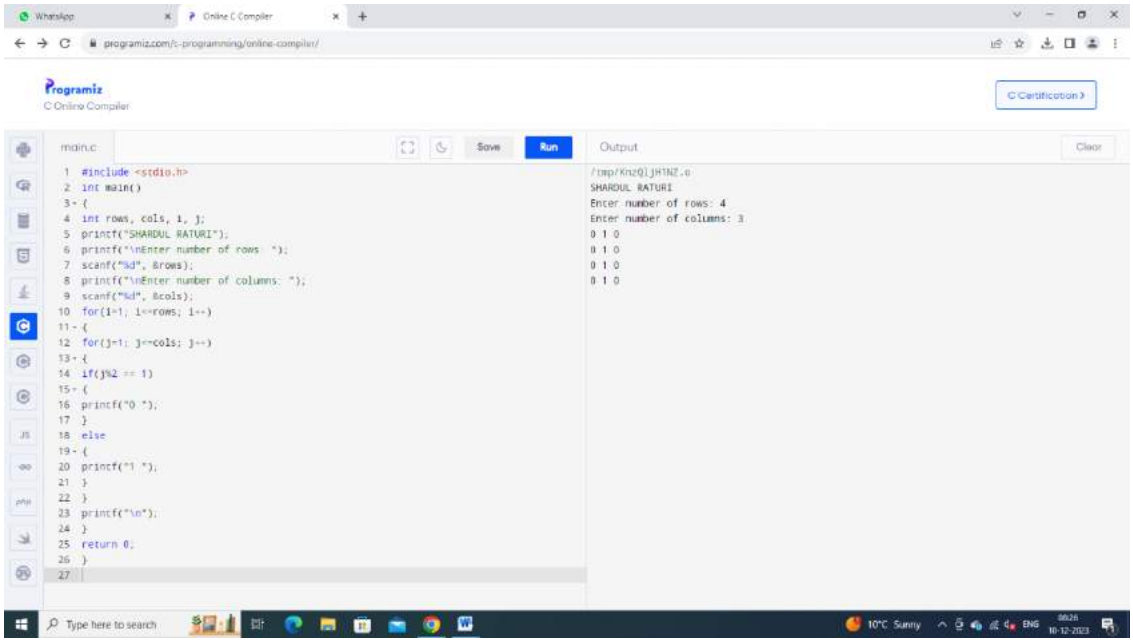
01010

01010

01010

```
#include <stdio.h>
int main()
{
int rows, cols, i, j;
printf("SHARDUL RATURI");
printf("\nEnter number of rows: ");
scanf("%d", &rows);
printf("\nEnter number of columns: ");
scanf("%d", &cols);
for(i=1; i<=rows; i++)
{
for(j=1; j<=cols; j++)
{
if(j%2 == 1)
{
printf("0 ");
}
else
{
printf("1 ");
}
}
```

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



PROGRAM 97.NUMBER PATTERN 4

11111

10001

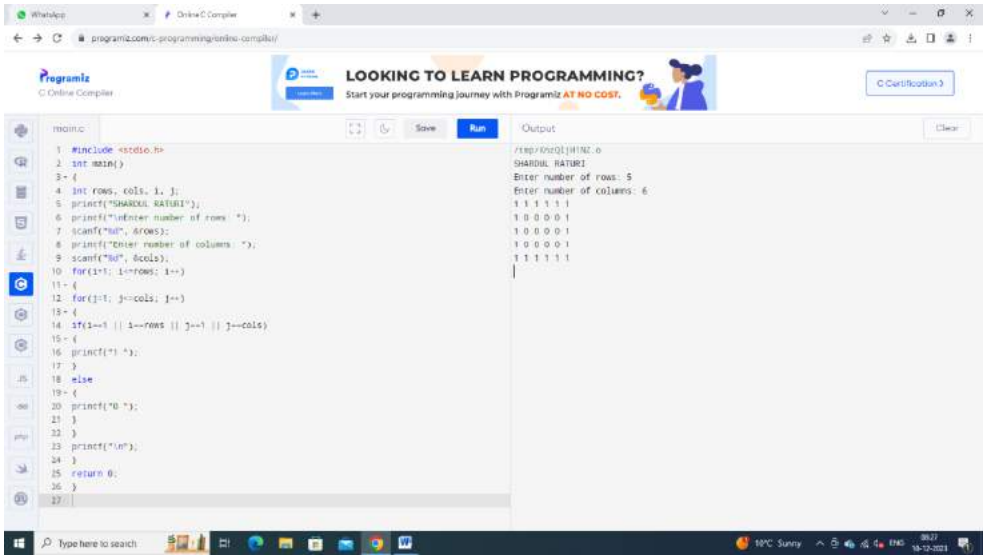
10001

10001

11111

```
#include <stdio.h>
int main()
{
```

```
int rows, cols, i, j;
printf("SHARDUL RATURI");
printf("\nEnter number of rows: ");
scanf("%d", &rows);
printf("Enter number of columns: ");
scanf("%d", &cols);
for(i=1; i<=rows; i++)
{
for(j=1; j<=cols; j++)
{
if(i==1 || i==rows || j==1 || j==cols)
{
printf("1 ");
}
else
{
printf("0 ");
}
}
printf("\n");
}
return 0;
}
```



PROGRAM 98.NUMBER PATTERN 5

11111

11111

11011

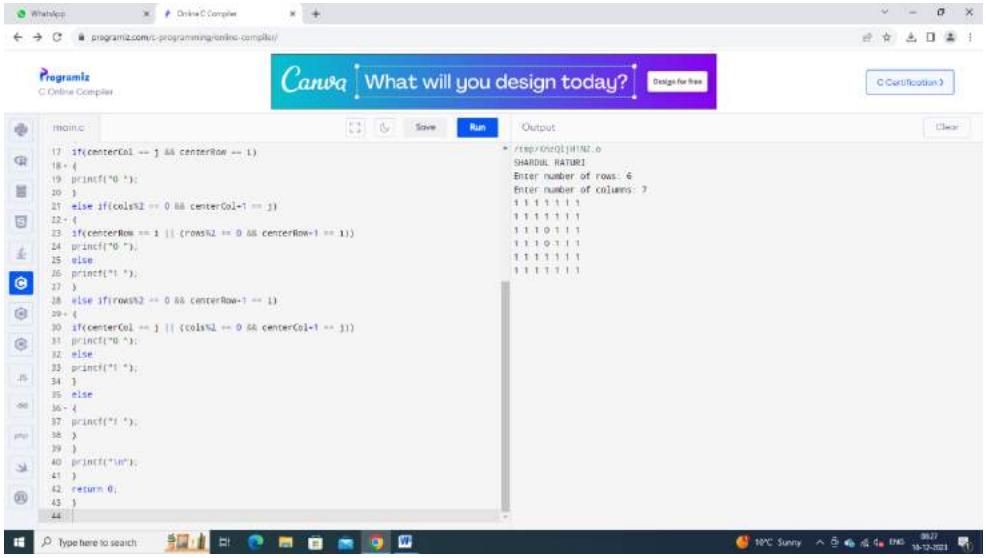
11111

11111

```
#include <stdio.h>
int main()
{
int rows, cols, i, j;
int centerRow, centerCol;
printf("SHARDUL RATURI");
printf("\nEnter number of rows: ");
scanf("%d", &rows);
```

```
printf("Enter number of columns: ");
scanf("%d", &cols);
centerRow = (rows + 1) / 2;
centerCol = (cols + 1) / 2;
for(i=1; i<=rows; i++)
{
for(j=1; j<=cols; j++)
{
if(centerCol == j && centerRow == i)
{
printf("0 ");
}
else if(cols%2 == 0 && centerCol+1 == j)
{
if(centerRow == i || (rows%2 == 0 && centerRow+1 == i))
printf("0 ");
else
printf("1 ");
}
else if(rows%2 == 0 && centerRow+1 == i)
{
if(centerCol == j || (cols%2 == 0 && centerCol+1 == j))
printf("0 ");
else
```

```
printf("1 ");
}
else
{
printf("1 ");
}
}
printf("\n");
}
return 0;
}
```



PROGRAM 99.NUMBER PATTERN 6

10101

01010

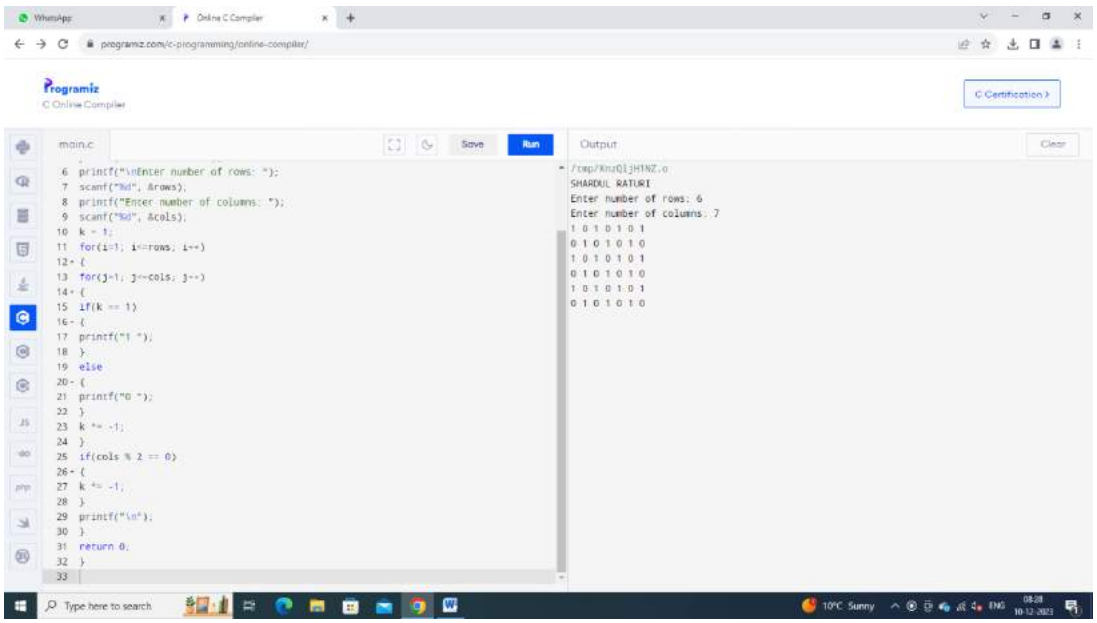
10101

01010

10101

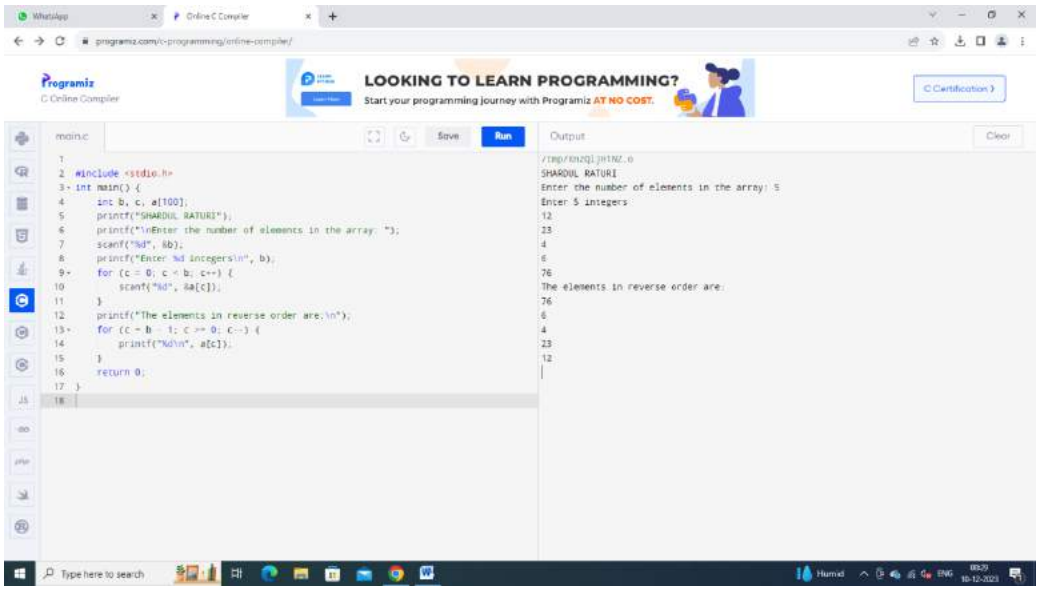
```
 #include <stdio.h>
int main()
{
int rows, cols, i, j, k;
printf("SHARDUL RATURI");
printf("\nEnter number of rows: ");
scanf("%d", &rows);
printf("Enter number of columns: ");
scanf("%d", &cols);
k = 1;
for(i=1; i<=rows; i++)
{
for(j=1; j<=cols; j++)
{
if(k == 1)
{
printf("1 ");
}
else
{
printf("0 ");
```

```
}
k *= -1;
}
if(cols % 2 == 0)
{
k *= -1;
}
printf("\n");
}
return 0;
}
```



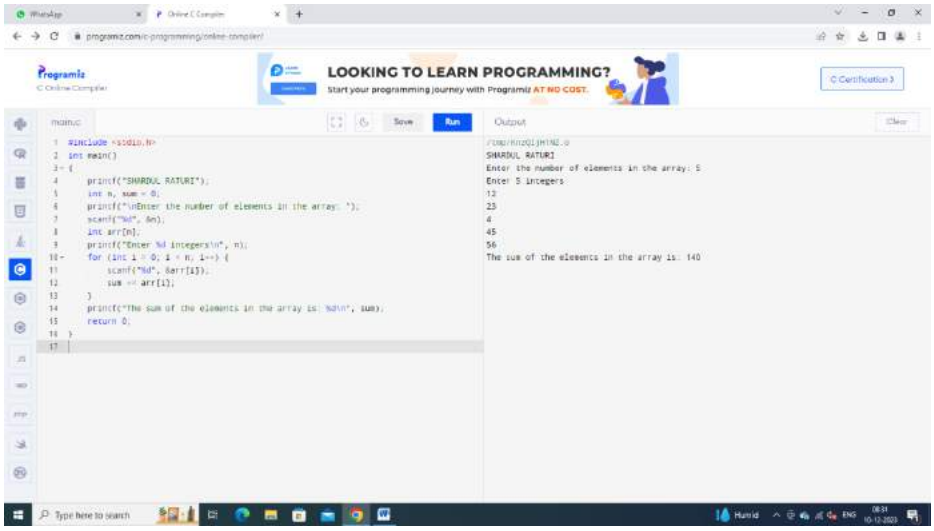
PROGRAM 100. TO READ N NUMBER OF VALUES IN AN ARRAY AND DISPLAY THEM IN REVERSE ORDER.

```c
#include <stdio.h>
int main() {
    int b, c, a[100];
    printf("SHARDUL RATURI");
    printf("\nEnter the number of elements in the array: ");
    scanf("%d", &b);
    printf("Enter %d integers\n", b);
    for (c = 0; c < b; c++) {
        scanf("%d", &a[c]);
    }
    printf("The elements in reverse order are:\n");
    for (c = b - 1; c >= 0; c--) {
        printf("%d\n", a[c]);
    }
    return 0;
}
```



PROGRAM 101. TO FIND THE SUM OF ALL ELEMENTS OF THE ARRAY.

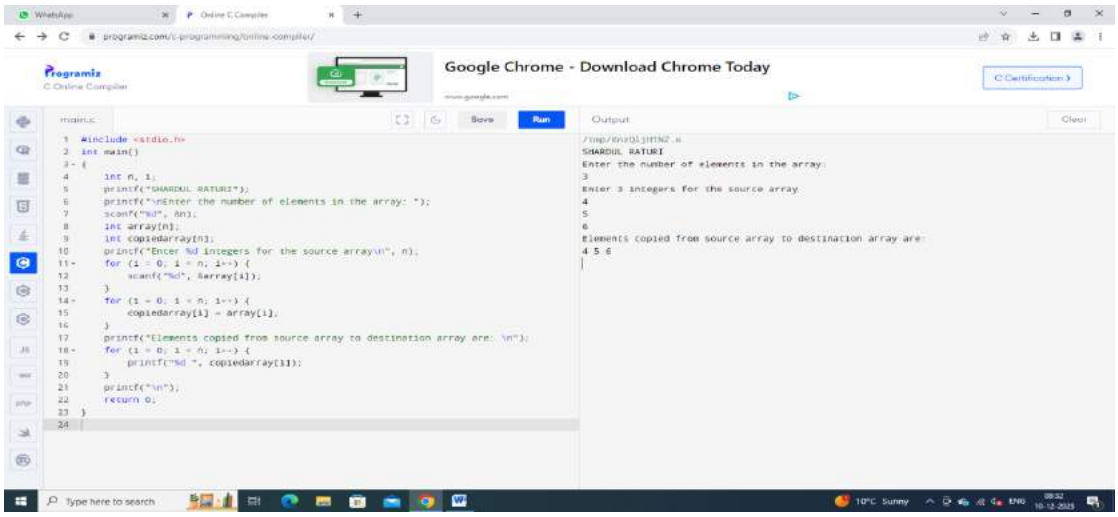
```
#include <stdio.h>
int main()
{
   printf("SHARDUL RATURI");
   int n, sum = 0;
   printf("\nEnter the number of elements in the array: ");
   scanf("%d", &n);
   int arr[n];
   printf("Enter %d integers\n", n);
   for (int i = 0; i < n; i++) {
      scanf("%d", &arr[i]);
      sum += arr[i];
  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



PROGRAM 102. TO COPY THE ELEMENTS OF ONE ARRAY INTO ANOTHER ARRAY.

```
#include <stdio.h>

int main()

{

   int n, i;

   printf("SHARDUL RATURI");

   printf("\nEnter the number of elements in the array: ");

   scanf("%d", &n);

   int array[n];

   int copiedarray[n];

   printf("Enter %d integers for the source array\n", n);

   for (i = 0; i < n; i++) {

      scanf("%d", &array[i]);

   }
```

```
    for (i = 0; i < n; i++) {
        copiedarray[i] = array[i];
    }
    printf("Elements copied from source array to destination array
are: \n");
    for (i = 0; i < n; i++) {
        printf("%d ", copiedarray[i]);
    }
    printf("\n");
    return 0;
}
```

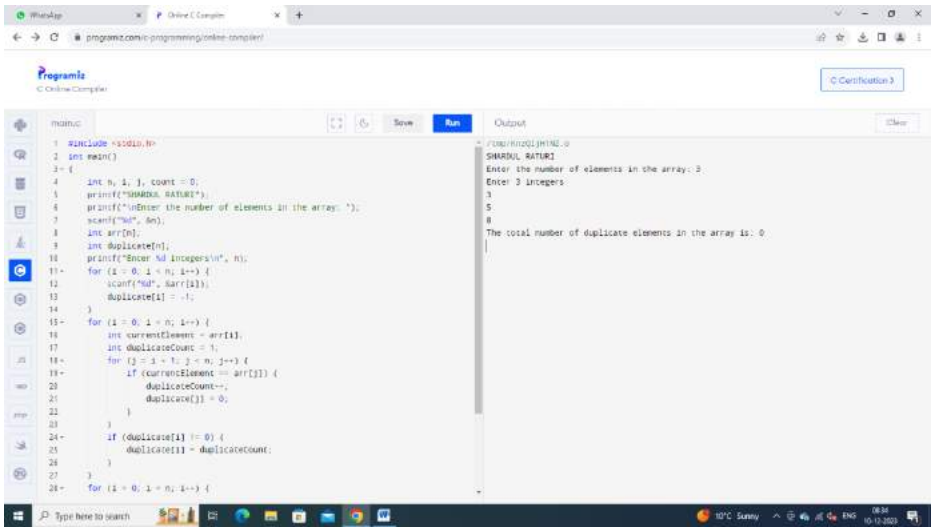


PROGRAM 103. TO COUNT THE TOTAL NUMBER OF DUPLICATE ELEMENTS IN AN ARRAY.

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

```
int main()
{
    int n, i, j, count = 0;
    printf("SHARDUL RATURI");
    printf("\nEnter the number of elements in the array: ");
    scanf("%d", &n);
    int arr[n];
    int duplicate[n];
    printf("Enter %d integers\n", n);
    for (i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
        duplicate[i] = -1;
    }
    for (i = 0; i < n; i++) {
        int currentElement = arr[i];
        int duplicateCount = 1;
        for (j = i + 1; j < n; j++) {
            if (currentElement == arr[j]) {
                duplicateCount++;
                duplicate[j] = 0;
            }
        }
        if (duplicate[i] != 0) {
            duplicate[i] = duplicateCount;
```

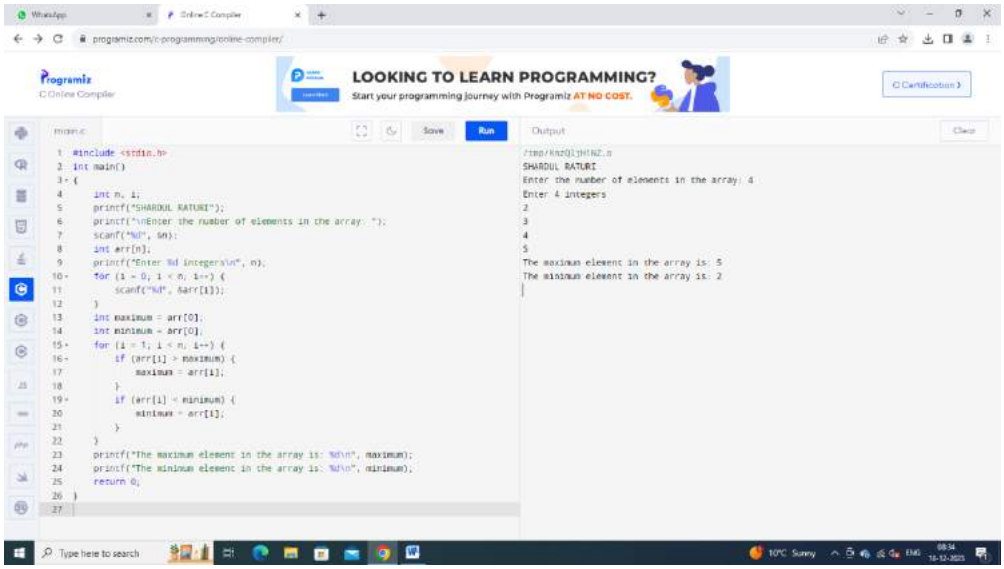
```
        }
    }
    for (i = 0; i < n; i++) {
        if (duplicate[i] > 1) {
            count++;
        }
    }
    printf("The total number of duplicate elements in the array is: %d\n", count);
    return 0;
}
```



PROGRAM 104. TO FIND THE MAXIMUM AND MINIMUM ELEMENTS IN AN ARRAY.

```
#include <stdio.h>

int main()

{
```

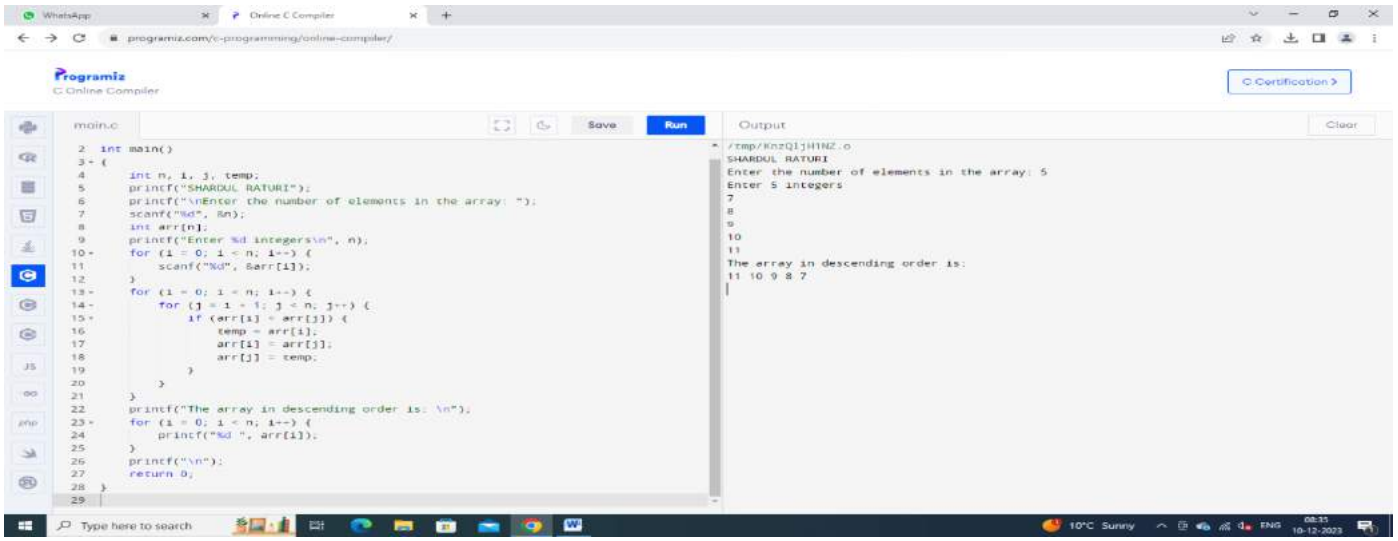
```
    int n, i;
    printf("SHARDUL RATURI");
    printf("\nEnter the number of elements in the array: ");
    scanf("%d", &n);
    int arr[n];
    printf("Enter %d integers\n", n);
    for (i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }
    int maximum = arr[0];
    int minimum = arr[0];
    for (i = 1; i < n; i++) {
        if (arr[i] > maximum) {
            maximum = arr[i];
        }
        if (arr[i] < minimum) {
            minimum = arr[i];
        }
    }
    printf("The maximum element in the array is: %d\n", maximum);
    printf("The minimum element in the array is: %d\n", minimum);
    return 0;
}
```



PROGRAM 105.. TO SORT THE ELEMENTS OF AN ARRAY IN DESCENDING ORDER

```
#include <stdio.h>

int main()

{

   int n, i, j, temp;

   printf("SHARDUL RATURI");

   printf("\nEnter the number of elements in the array: ");

   scanf("%d", &n);

   int arr[n];

   printf("Enter %d integers\n", n);

   for (i = 0; i < n; i++) {

      scanf("%d", &arr[i]);

   }

   for (i = 0; i < n; i++) {

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

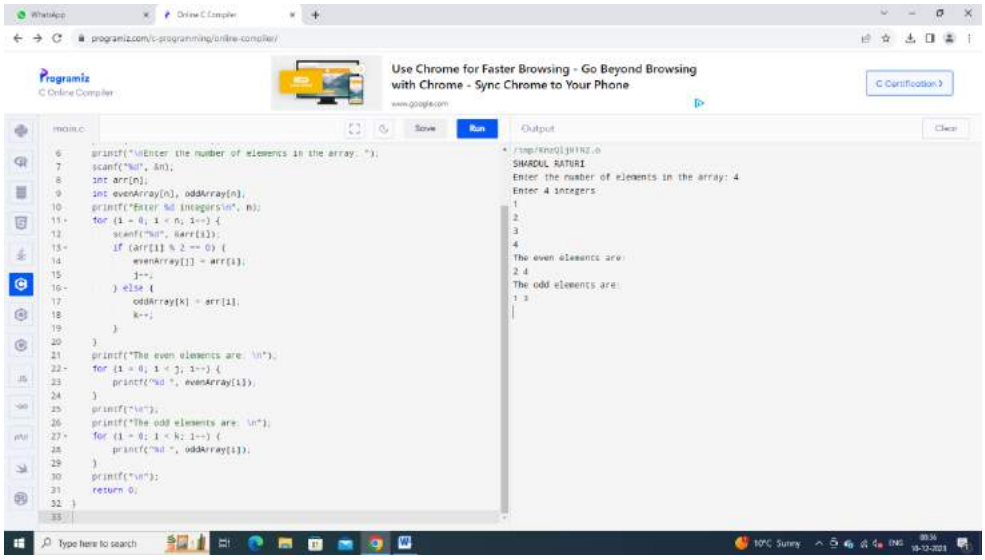
```
            if (arr[i] < arr[j]) {
                temp = arr[i];
                arr[i] = arr[j];
                arr[j] = temp;
            }
        }
    }
    printf("The array in descending order is: \n");
    for (i = 0; i < n; i++) {
        printf("%d ", arr[i]);
    }
    printf("\n");
    return 0;
}
```



PROGRAM 106. TO SEPARATE ODD AND EVEN INTEGERS INTO SEPARATE ARRAYS.

```
#include <stdio.h>
int main()
{
   int n, i, j = 0, k = 0;
   printf("SHARDUL RATURI");
   printf("\nEnter the number of elements in the array: ");
   scanf("%d", &n);
   int arr[n];
   int evenArray[n], oddArray[n];
   printf("Enter %d integers\n", n);
   for (i = 0; i < n; i++) {
      scanf("%d", &arr[i]);
      if (arr[i] % 2 == 0) {
         evenArray[j] = arr[i];
         j++;
      } else {
         oddArray[k] = arr[i];
         k++;
      }
   }
   printf("The even elements are: \n");
   for (i = 0; i < j; i++) {
      printf("%d ", evenArray[i]);
   }
```

```
    printf("\n");
    printf("The odd elements are: \n");
    for (i = 0; i < k; i++) {
        printf("%d ", oddArray[i]);
    }
    printf("\n");
    return 0;
}
```

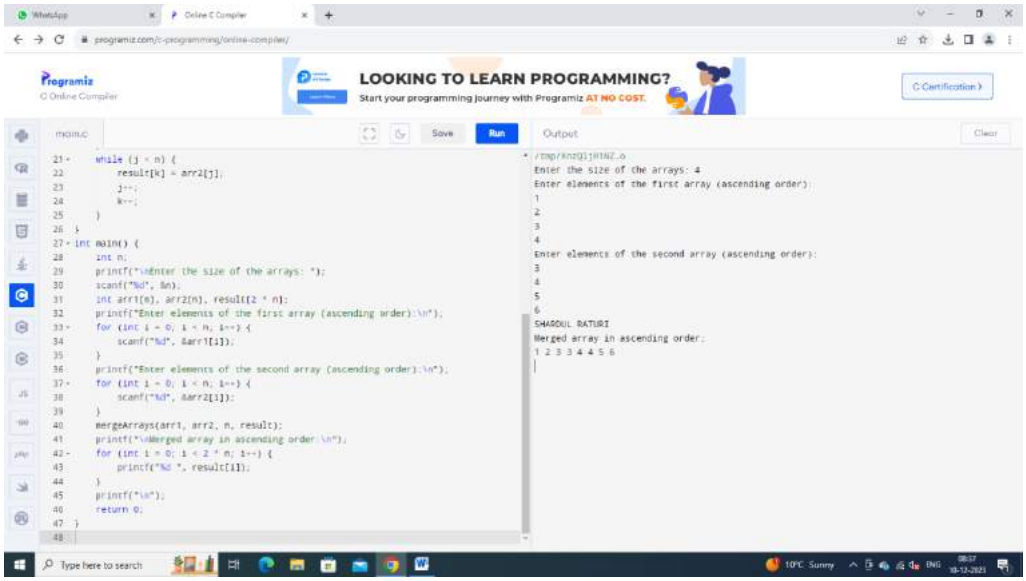


PROGRAM 107. WRITE A PROGRAM IN C TO MERGE TWO ARRAYS OF THE SAME SIZE SORTED IN ASCENDING ORDER

```
#include <stdio.h>
void mergeArrays(int arr1[], int arr2[], int n, int result[])
{
    int i = 0, j = 0, k = 0;
    printf("SHARDUL RATURI");
```

```
    while (i < n && j < n) {
        if (arr1[i] <= arr2[j]) {
            result[k] = arr1[i];
            i++;
        } else {
            result[k] = arr2[j];
            j++;
        }
        k++;
    }
    while (i < n) {
        result[k] = arr1[i];
        i++;
        k++;
    }
    while (j < n) {
        result[k] = arr2[j];
        j++;
        k++;
    }
}
int main() {
    int n;
    printf("\nEnter the size of the arrays: ");
```

```
    scanf("%d", &n);
    int arr1[n], arr2[n], result[2 * n];
    printf("Enter elements of the first array (ascending order):\n");
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr1[i]);
    }
    printf("Enter elements of the second array (ascending order):\n");
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr2[i]);
    }
    mergeArrays(arr1, arr2, n, result);
    printf("\nMerged array in ascending order:\n");
    for (int i = 0; i < 2 * n; i++) {
        printf("%d ", result[i]);
    }
    printf("\n");
    return 0;
}
```

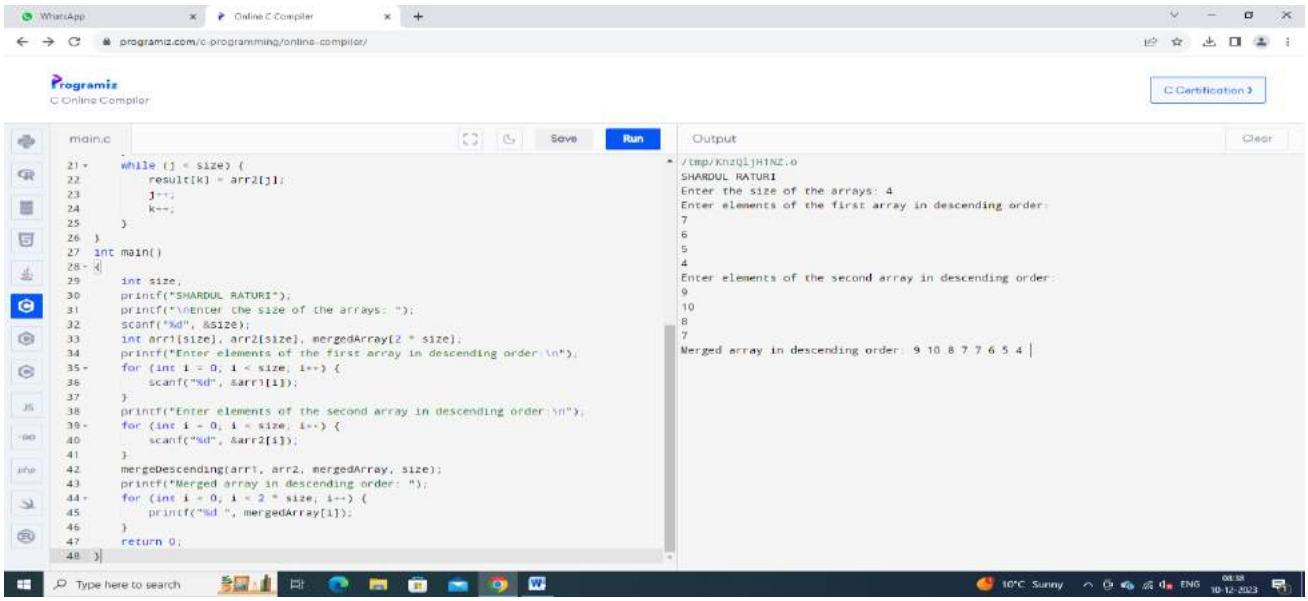


PROGRAM 108. TO MERGE TWO ARRAYS OF THE SAME SIZE SORTED IN DESCENDING ORDER.

```
#include <stdio.h>


void mergeDescending(int arr1[], int arr2[], int result[], int size) {
    int i = 0, j = 0, k = 0;


    while (i < size && j < size) {
        if (arr1[i] >= arr2[j]) {
            result[k] = arr1[i];
            i++;
        } else {
            result[k] = arr2[j];
            j++;
```

```
        }
        k++;
    }
    while (i < size) {
        result[k] = arr1[i];
        i++;
        k++;
    }
    while (j < size) {
        result[k] = arr2[j];
        j++;
        k++;
    }
}
int main()
{
    int size;
    printf("SHARDUL RATURI");
    printf("\nEnter the size of the arrays: ");
    scanf("%d", &size);
    int arr1[size], arr2[size], mergedArray[2 * size];
    printf("Enter elements of the first array in descending order:\n");
    for (int i = 0; i < size; i++) {
        scanf("%d", &arr1[i]);
```

```
    }
    printf("Enter elements of the second array in descending
order:\n");
    for (int i = 0; i < size; i++) {
        scanf("%d", &arr2[i]);
    }
    mergeDescending(arr1, arr2, mergedArray, size);
    printf("Merged array in descending order: ");
    for (int i = 0; i < 2 * size; i++) {
        printf("%d ", mergedArray[i]);
    }
    return 0;
}
```



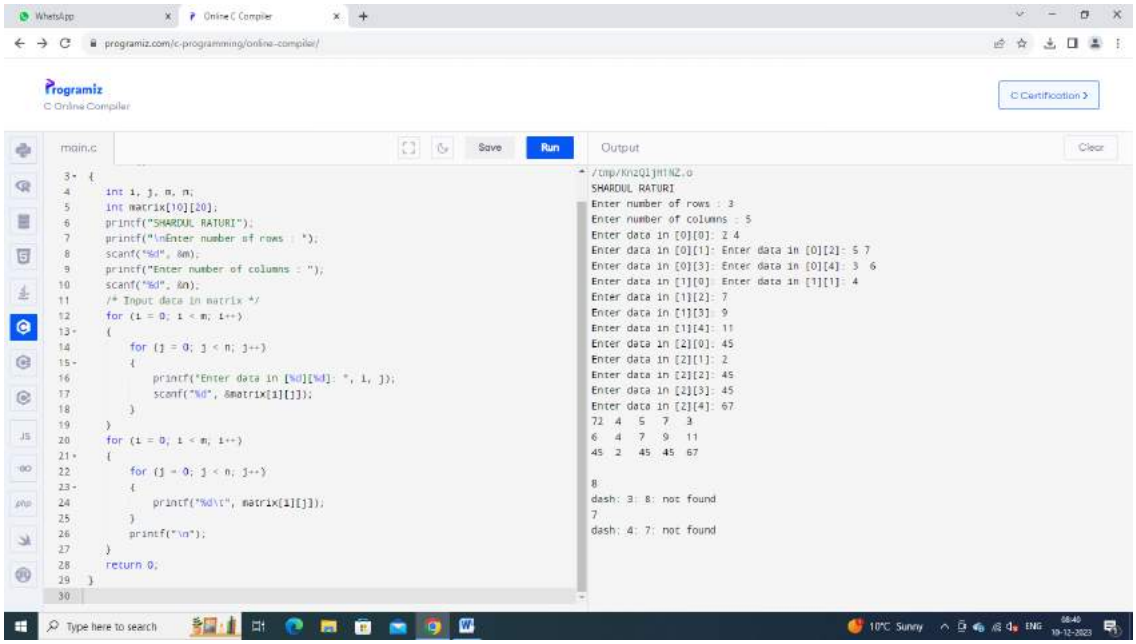
PROGRAM . CONSIDER TWO MATRICES OF THE SIZE M AND N. IMPLEMENT

MATRIX OPERATION AND DISPLAY. SHOW THESE THINGS IN PROGRAM

109) READ MATRIX ELEMENTS AND DISPLAY

```
#include <stdio.h>
 int main()
 {
   int i, j, m, n;
   int matrix[10][20];
   printf("SHARDUL RATURI");
   printf("\nEnter number of rows : ");
   scanf("%d", &m);
   printf("Enter number of columns : ");
   scanf("%d", &n);
   /* Input data in matrix */
   for (i = 0; i < m; i++)
   {
      for (j = 0; j < n; j++)
      {
         printf("Enter data in [%d][%d]: ", i, j);
         scanf("%d", &matrix[i][j]);
      }
   }
```

```
    for (i = 0; i < m; i++)
    {
        for (j = 0; j < n; j++)
        {
            printf("%d\t", matrix[i][j]);
        }
        printf("\n");
    }
    return 0;
}
```

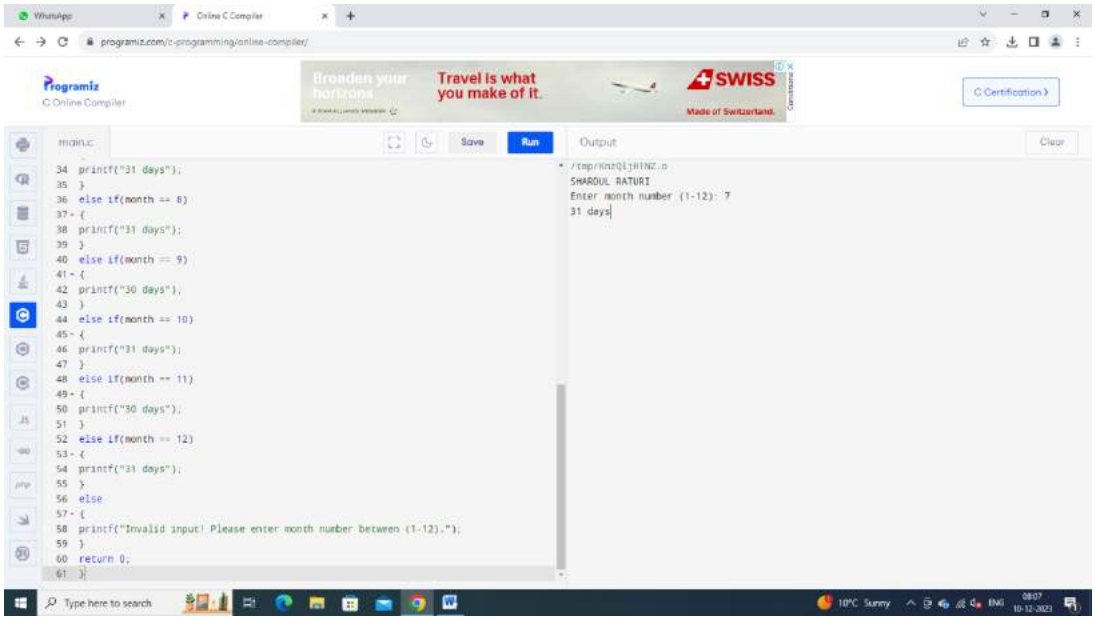


110) MATRIX MULTIPLICATION AND DISPLAY

```
#include<stdio.h>
 #include<stdlib.h>
 int main()
```

```
{
  int a[10][10],b[10][10],mul[10][10],r,c,i,j,k;
   printf("SHARDUL RATURI");
  printf("\nenter the number of row=");
  scanf("%d",&r);
  printf("enter the number of column=");
  scanf("%d",&c);
  printf("enter the first matrix element=\n");
  for(i=0;i<r;i++)
  {
  for(j=0;j<c;j++)
  {
  scanf("%d",&a[i][j]);
  }
  }
  printf("enter these second matrix element=\n");
  for(i=0;i<r;i++)
  {
  for(j=0;j<c;j++)
  {
  scanf("%d",&b[i][j]);
  }
  }
  printf("multiply of the matrix=\n");
```

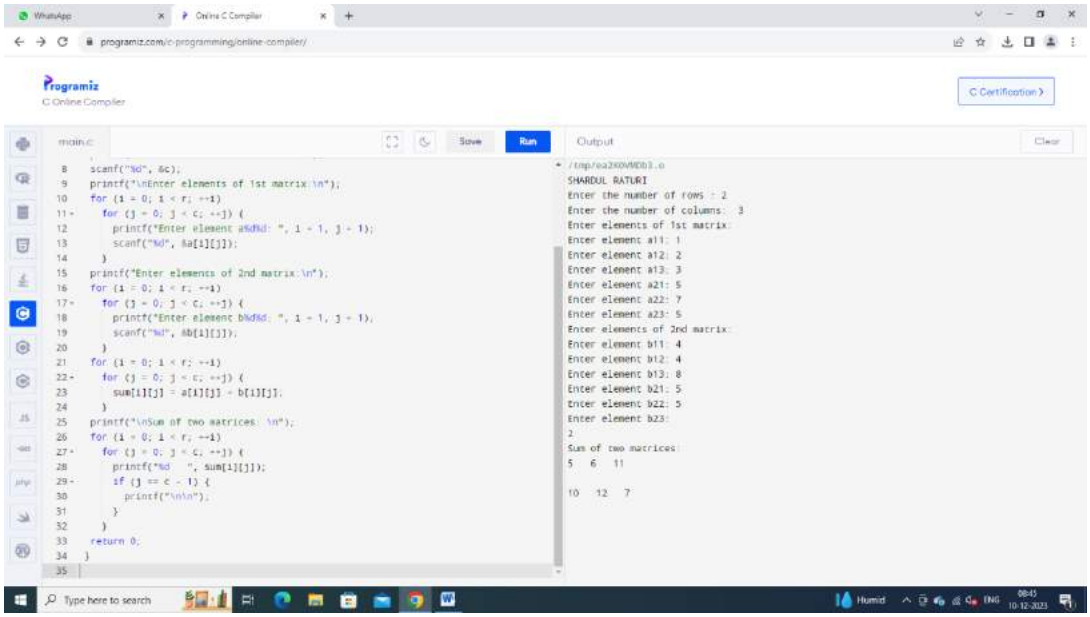
```
  for(i=0;i<r;i++)
  {
  for(j=0;j<c;j++)
  {
  mul[i][j]=0;
  for(k=0;k<c;k++)
  {
  mul[i][j]+=a[i][k]*b[k][j];
  }
  }
  }
  for(i=0;i<r;i++)
  {
  for(j=0;j<c;j++)
  {
  printf("%d\t",mul[i][j]);
  }
  printf("\n");
  }
  return 0;
}
```



111) ADDITION OF MATRIX AND DISPLAY

```
#include <stdio.h>
 int main() {
  int r, c, a[100][100], b[100][100], sum[100][100], i, j;
  printf("SHARDUL RATURI");
  printf("\nEnter the number of rows : ");
  scanf("%d", &r);
  printf("Enter the number of columns:  ");
  scanf("%d", &c);
  printf("\nEnter elements of 1st matrix:\n");
  for (i = 0; i < r; ++i)
    for (j = 0; j < c; ++j) {
      printf("Enter element a%d%d: ", i + 1, j + 1);
      scanf("%d", &a[i][j]);
```

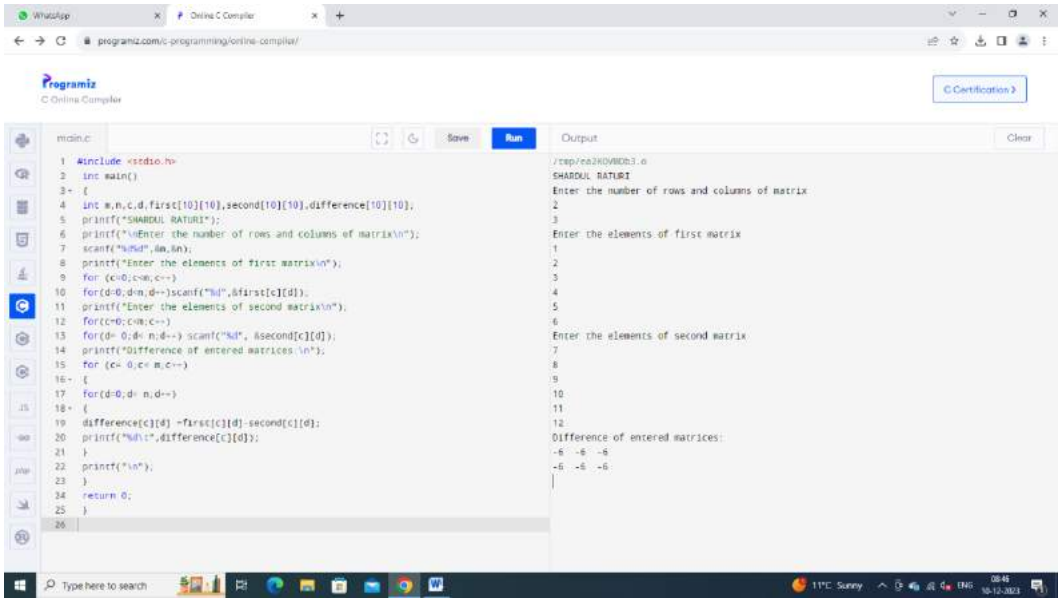
```
  }
 printf("Enter elements of 2nd matrix:\n");
 for (i = 0; i < r; ++i)
  for (j = 0; j < c; ++j) {
   printf("Enter element b%d%d: ", i + 1, j + 1);
   scanf("%d", &b[i][j]);
  }
 for (i = 0; i < r; ++i)
  for (j = 0; j < c; ++j) {
   sum[i][j] = a[i][j] + b[i][j];
  }
 printf("\nSum of two matrices: \n");
 for (i = 0; i < r; ++i)
  for (j = 0; j < c; ++j) {
   printf("%d   ", sum[i][j]);
   if (j == c - 1) {
    printf("\n\n");
   }
  }
 return 0;
}
```



112)SUBTRACTION OF MATRIX AND DISPLAY

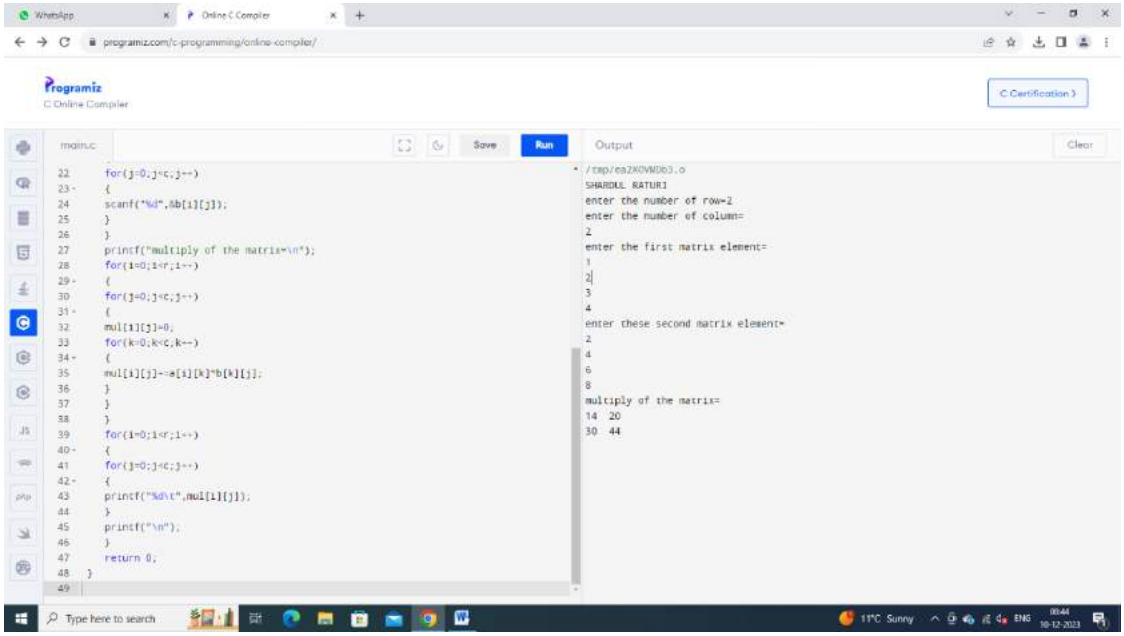
```
#include <stdio.h>
 int main()
 {
 int m,n,c,d,first[10][10],second[10][10],difference[10][10];
 printf("SHARDUL RATURI");
 printf("\nEnter the number of rows and columns of matrix\n");
 scanf("%d%d",&m,&n);
 printf("Enter the elements of first matrix\n");
 for (c=0;c<m;c++)
 for(d=0;d<n;d++)scanf("%d",&first[c][d]);
 printf("Enter the elements of second matrix\n");
 for(c=0;c<m;c++)
 for(d= 0;d< n;d++) scanf("%d", &second[c][d]);
```

```
printf("Difference of entered matrices:\n");
for (c= 0;c< m;c++)
{
for(d=0;d< n;d++)
{
difference[c][d] =first[c][d]-second[c][d];
printf("%d\t",difference[c][d]);
}
printf("\n");
}
return 0;
}
```



113)TRANSPOSE OF MATRIX AND DISPLAY

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

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

```
            printf("%d ", transpose[i][j]);
        }
        printf("\n");
    }

    return 0;
}
```