[ASSIGNMENT]

[C PROGRAMMING]

Graphic Era

Deemed to be University
Accredited by NAAC with Grade A
NBA Accredited Programs in ECE, CSE & ME
Approved by AICTE, Ministry of HRD, Govt. of India

SUBMITTED BY:
SHISHANT CHOUDHARY

SUBMITTED TO:
MR RISHI KUMAR

1.WAP for hello world or this is my first C Program.

ANS :

main.c

```c
#include <stdio.h>

int main() {


    printf("SHISHANT CHOUDHARY\n");
    printf("hello world");

     return 0;

}
```

```
SHISHANT CHOUDHARY
hello world
```

2.WAP to add two numbers

.ANS:

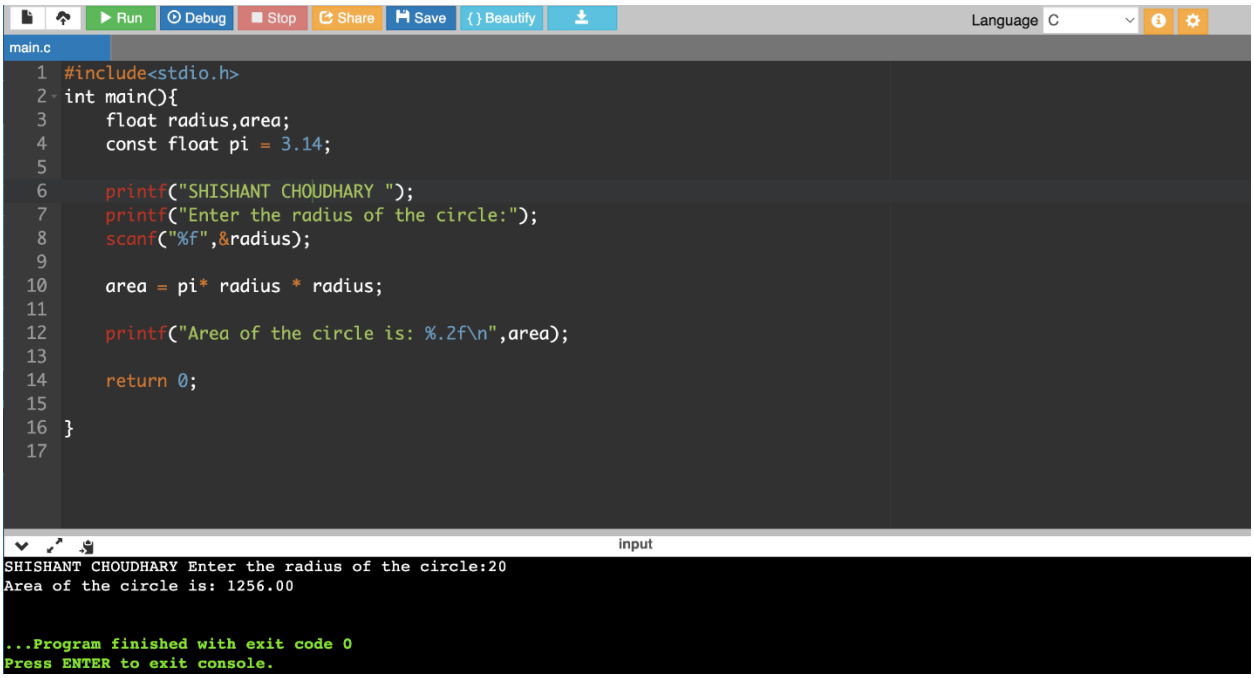
main.c

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

    int a, b, sum;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter two integers: ");
    scanf("%d %d", &a, &b);

    sum =a + b;

    printf("%d + %d = %d", a, b, sum);
    return 0;
}

```

```
SHISHANT CHOUDHARY
Enter two integers: 5 6
5 + 6 = 11
```

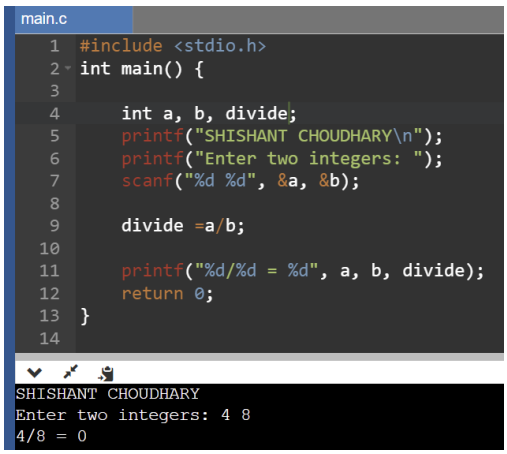
3.WAP to find area of circle.

ANS:



4.WAP to divide two numbers.

ANS:



5. WAP to print ASCII value.

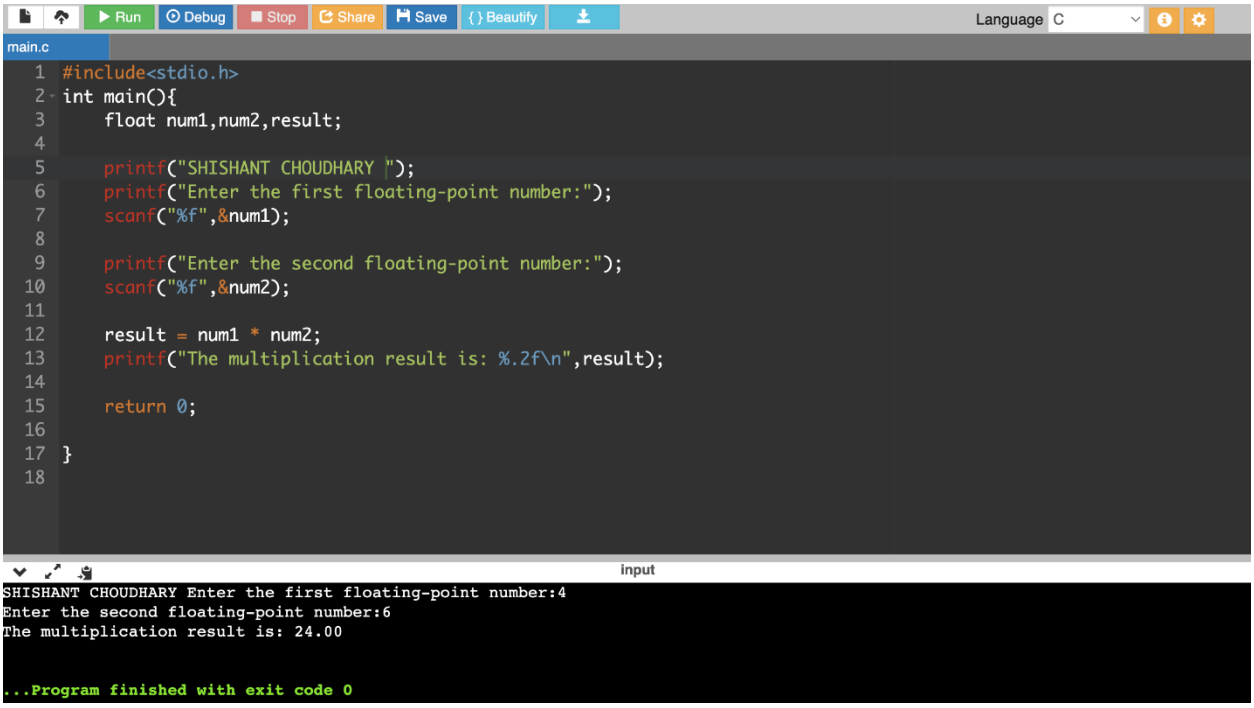
ANS:

```c
#include<stdio.h>
int main(){
    char ch;

    printf("SHISHANT CHOUDHARY ");
    printf("enter the character:");
    scanf("%c",&ch);

    printf("The ASCII value of '%c' is: %d\n",ch,ch);

    return 0;

}
```

```
SHISHANT CHOUDHARY enter the character:S
The ASCII value of 'S' is: 83


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

6. WAP to multiply floating point numbers.

ANS:

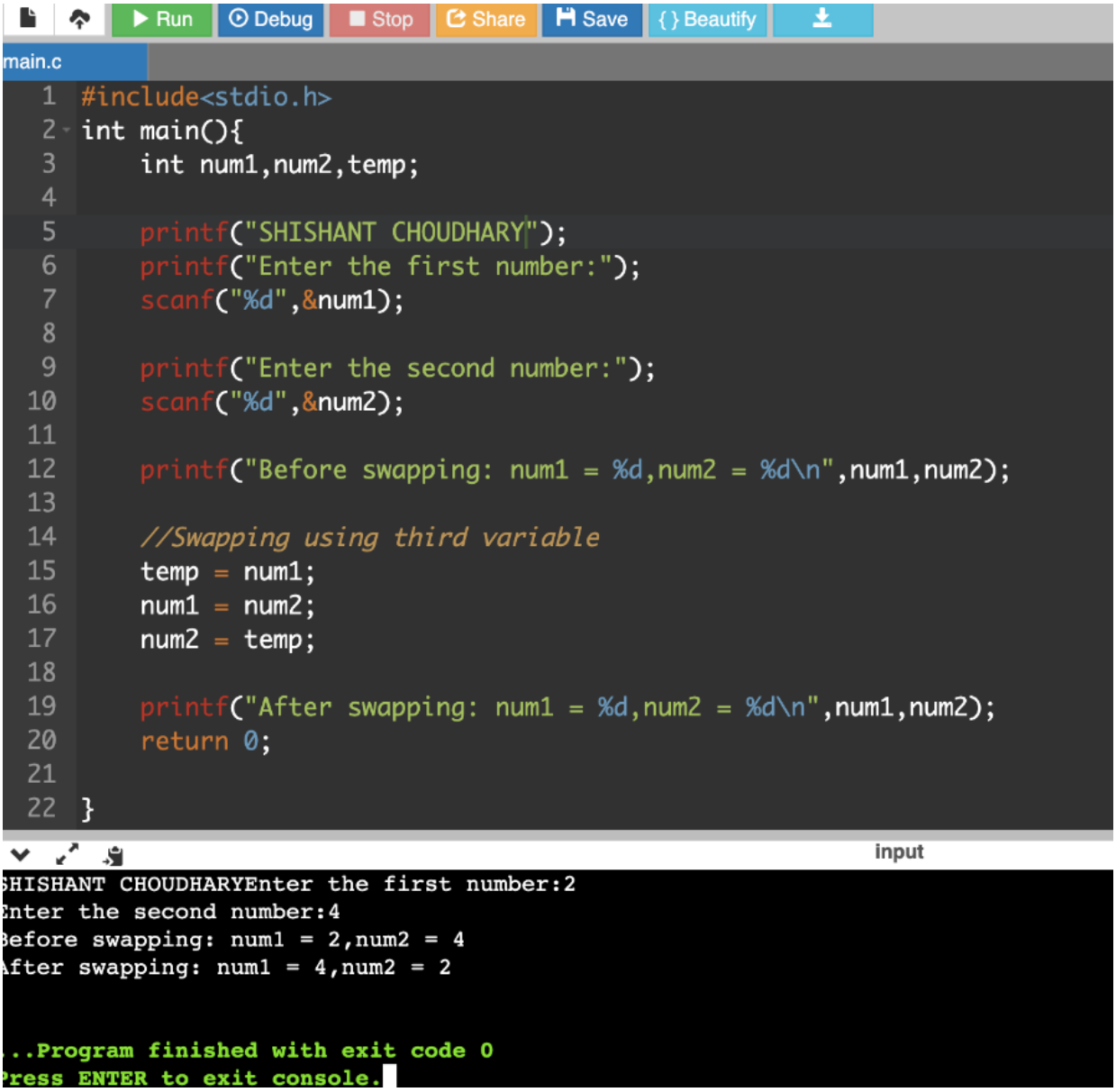


```c
#include<stdio.h>
int main(){
    float num1,num2,result;

    printf("SHISHANT CHOUDHARY ");
    printf("Enter the first floating-point number:");
    scanf("%f",&num1);

    printf("Enter the second floating-point number:");
    scanf("%f",&num2);

    result = num1 * num2;
    printf("The multiplication result is: %.2f\n",result);

    return 0;

}
```

```
SHISHANT CHOUDHARY Enter the first floating-point number:4
Enter the second floating-point number:6
The multiplication result is: 24.00


...Program finished with exit code 0
```

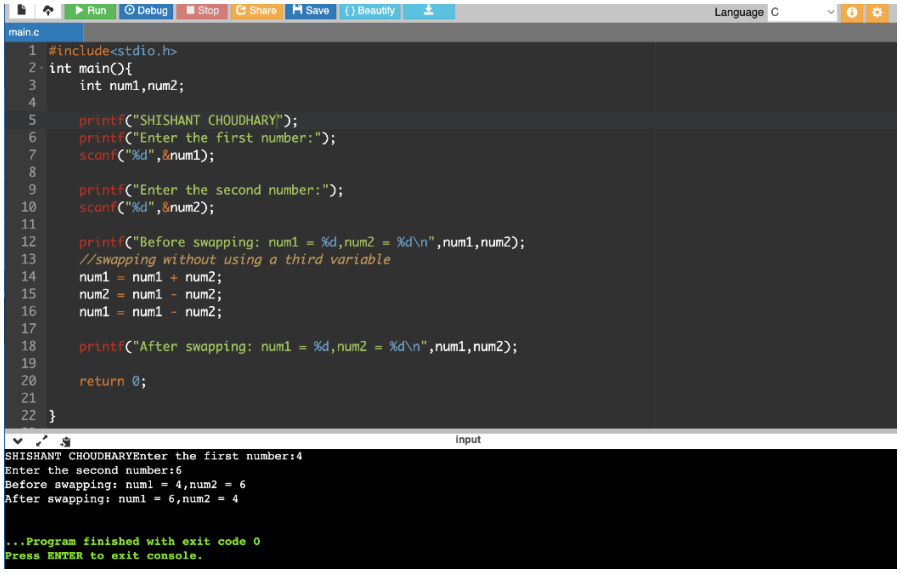
7. WAP to SWAP two vairables number by using third variable.

ANS:



8. WAP to SWAP two vairables number without using third Variables.

ANS:



```c
#include<stdio.h>
int main(){
    int num1,num2;

    printf("SHISHANT CHOUDHARY");
    printf("Enter the first number:");
    scanf("%d",&num1);

    printf("Enter the second number:");
    scanf("%d",&num2);

    printf("Before swapping: num1 = %d,num2 = %d\n",num1,num2);
    //swapping without using a third variable
    num1 = num1 + num2;
    num2 = num1 - num2;
    num1 = num1 - num2;

    printf("After swapping: num1 = %d,num2 = %d\n",num1,num2);

    return 0;

}
```

```
SHISHANT CHOUDHARYEnter the first number:4
Enter the second number:6
Before swapping: num1 = 4,num2 = 6
After swapping: num1 = 6,num2 = 4

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

9. WAP to SWAP three vairable numbers without using third variables.

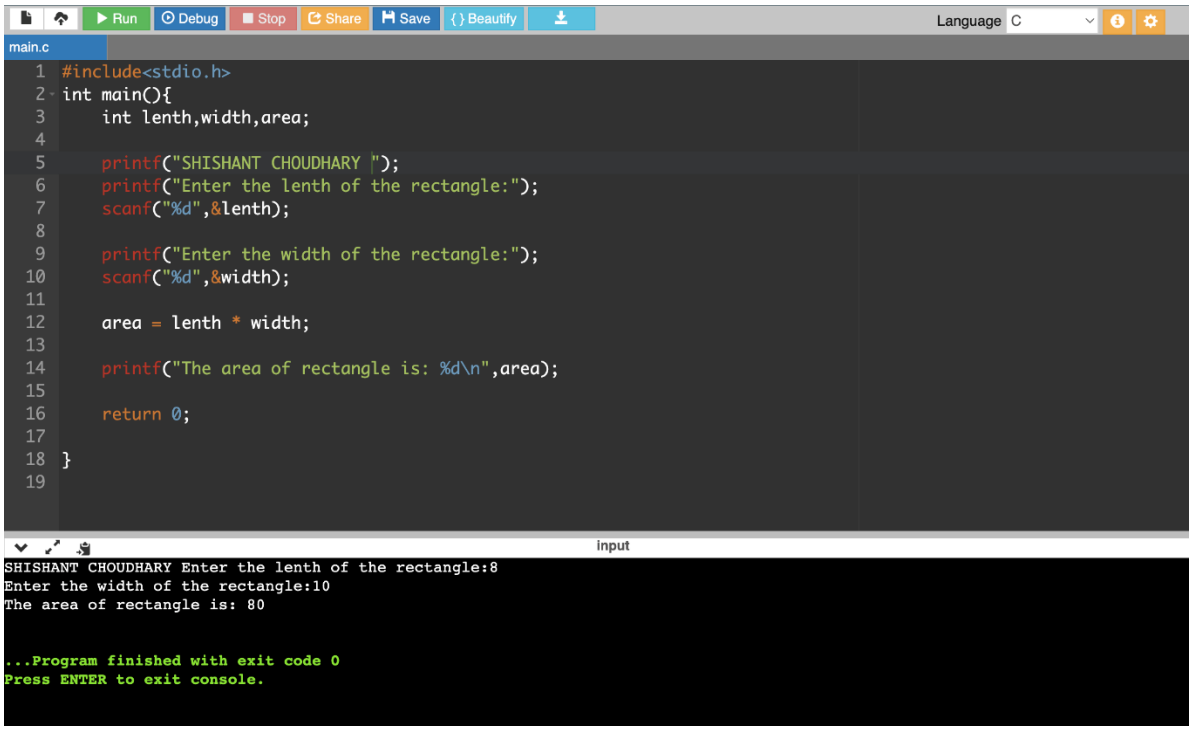
ANS:

```c
#include<stdio.h>
int main
(){
    int num1,num2,num3;
    printf("SHISHANT CHOUDHARY ");
    printf("Enter the first number:");
    scanf("%d",&num1);

    printf("Enter the second number:");
    scanf("%d",&num2);

    printf("Enter the third number:");
    scanf("%d",&num3);

    printf("Before swapping: num1 = %d,num2 = %d,num3 = %d\n",num1,num2,num3);

    //swapping without using a third variable
    num1 = num1 + num2 + num3;
    num2 = num1 - (num2 + num3);
    num3 = num1 - (num2 + num3);
    num1 = num1 - (num2 + num3);

    printf("After swapping: num1 = %d,num2 = %d,num3 = %d\n",num1,num2,num3);

    return 0;

}
```

```
SHISHANT CHOUDHARY Enter the first number:2
Enter the second number:4
Enter the third number:6
Before swapping: num1 = 2,num2 = 4,num3 = 6
After swapping: num1 = 6,num2 = 2,num3 = 4
```

10. Wap to find the area of rectangle.

ANS:

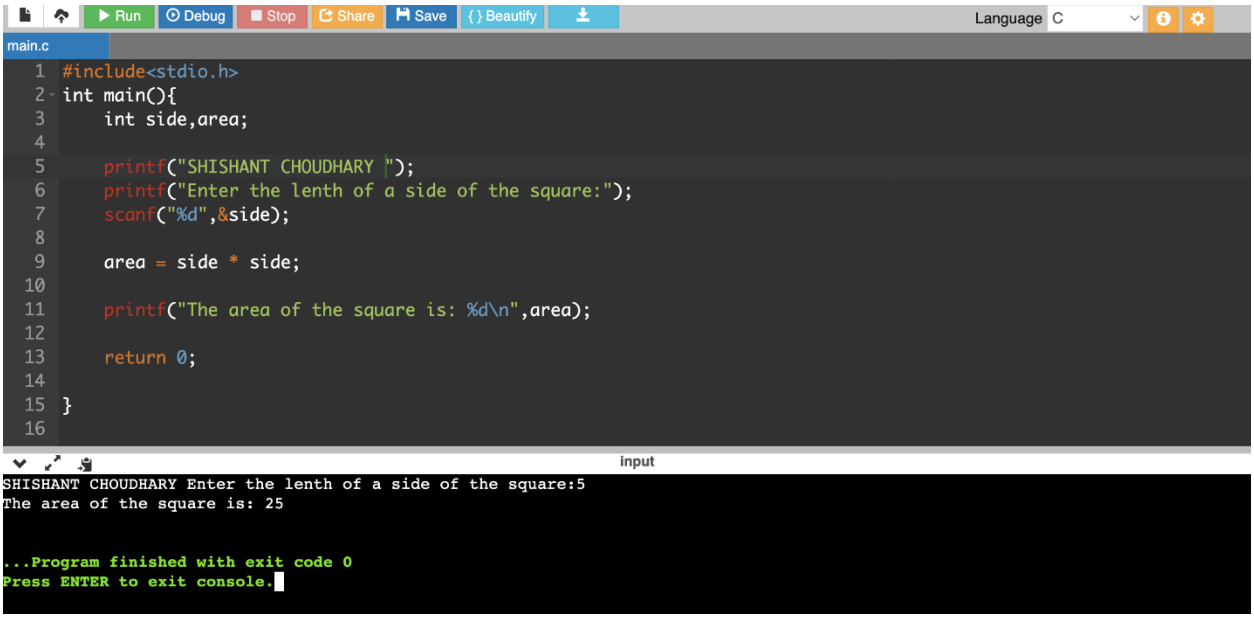


```c
#include<stdio.h>
int main(){
    int lenth,width,area;

    printf("SHISHANT CHOUDHARY ");
    printf("Enter the lenth of the rectangle:");
    scanf("%d",&lenth);

    printf("Enter the width of the rectangle:");
    scanf("%d",&width);

    area = lenth * width;

    printf("The area of rectangle is: %d\n",area);

    return 0;

}
```

```
SHISHANT CHOUDHARY Enter the lenth of the rectangle:8
Enter the width of the rectangle:10
The area of rectangle is: 80


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

11. WAP to find area of square

ANS:



```c
#include<stdio.h>
int main(){
    int side,area;

    printf("SHISHANT CHOUDHARY ");
    printf("Enter the lenth of a side of the square:");
    scanf("%d",&side);

    area = side * side;

    printf("The area of the square is: %d\n",area);

    return 0;

}
```

```
SHISHANT CHOUDHARY Enter the lenth of a side of the square:5
The area of the square is: 25


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

12. wap to find Area and Volume of Cube.

ANS;

main.c

```c
#include <stdio.h>

int main() {
    float side, area, volume;

    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the side length of the cube: ");
    scanf("%f", &side);

    area = 6 * side * side;

    volume = side * side * side;

    printf("The area of the cube is: %.f\n", area);
    printf("The volume of the cube is: %.f\n", volume);

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter the side length of the cube: 4
The area of the cube is: 96
The volume of the cube is: 64
```

14. wap to find area and volume of cuboid

ANS:

main.c

```c
#include <stdio.h>

int main() {
    float l,b,h, area, volume;

    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the l of the cuboid: ");
    scanf("%f", &l);
    printf("enter the b of cuboid");
    scanf("%f",&b);
    printf("enter the h of the cuboid");
    scanf("%f",&h);


    area = 2*(l*b+l*h+b*h);

    volume = l * b * h;

    printf("The area of the cuboid is: %.f\n", area);
    printf("The volume of the cuboid is: %.f\n", volume);

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter the l of the cuboid: 4
enter the b of cuboid6
enter the h of the cuboid2
The area of the cuboid is: 88
The volume of the cuboid is: 48


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

15. WAP to find the largest number using the Logical AND operator.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int num1, num2, num3, largest;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter three numbers: ");
    scanf("%d %d %d", &num1, &num2, &num3);

    largest = num1;

    if (num2 > largest && num2 > num3) {
        largest = num2;
    }
    if (num3 > largest && num3 > num2) {
        largest = num3;
    }
    printf("The largest number is: %d\n", largest);

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter three numbers: 3 4 5
The largest number is: 5
```

16. WAP to validate the username and password entered by the user is correct or not using the predefined username and password.

ANS:

main.c

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

int main() {
    char username[20];
    char password[20];

    char correctUsername[] = "shishant";
    char correctPassword[] = "123";
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter your username: ");
    scanf("%s", username);
    printf("Enter your password: ");
    scanf("%s", password);

    if (strcmp(username, correctUsername) == 0 && strcmp(password, correctPassword) == 0) {
        printf("Login successful!\n");
    } else {
        printf("Login failed. Invalid username or password.\n");
    }

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter your username: shishant
Enter your password: 123
Login successful!


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

17. WAP to input the positive number from the user to perform the Left shift operator.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int num, shift;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a positive number: ");
    scanf("%d", &num);

    printf("Enter the number of bits to shift to the left: ");
    scanf("%d", &shift);

    int result = num << shift;

    printf("Result after left shift: %d\n", result);

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a positive number: 6
Enter the number of bits to shift to the left: 3
Result after left shift: 48


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

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

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int num, shift;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a positive number: ");
    scanf("%d", &num);

    printf("Enter the number of bits to shift to the rigth: ");
    scanf("%d", &shift);

    int result = num >> shift;

    printf("Result after rigth shift: %d\n", result);

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a positive number: 5
Enter the number of bits to shift to the rigth: 1
Result after rigth shift: 2
```

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

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int a = 10, b = 5;

    // Pre-increment a and pre-decrement b
    int originalA = a;
    int originalB = b;
    ++a;
    --b;
    // Print the original and updated values
    printf("SHISHANT CHOUDHARY\n");
    printf("Original value of a: %d\n", originalA);
    printf("Updated value of a (after pre-increment): %d\n", a);
    printf("Original value of b: %d\n", originalB);
    printf("Updated value of b (after pre-decrement): %d\n", b);

    return 0;
}

```

input

```
SHISHANT CHOUDHARY
Original value of a: 10
Updated value of a (after pre-increment): 11
Original value of b: 5
Updated value of b (after pre-decrement): 4
```

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

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int num1 = 5;
    int num2 = 7;

    // Post-increment operator (num++)
    printf("SHISHANT CHOUDHARY\n");
    printf("Post-increment operator on num1:\n");
    printf("Original value of num1: %d\n", num1);
    int updatedNum1 = num1++;
    printf("Updated value of num1: %d\n\n", updatedNum1);

    // Post-decrement operator (num--)
    printf("Post-decrement operator on num2:\n");
    printf("Original value of num2: %d\n", num2);
    int updatedNum2 = num2--;
    printf("Updated value of num2: %d\n", updatedNum2);

    return 0;
}

```

```
SHISHANT CHOUDHARY
Post-increment operator on num1:
Original value of num1: 5
Updated value of num1: 5

Post-decrement operator on num2:
Original value of num2: 7
Updated value of num2: 7


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

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

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int number;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter an integer number: ");
    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 9 or 7.\n", number);
    }

    return 0;
}

```

input

```
SHISHANT CHOUDHARY
Enter an integer number: 45
45 is divisible by either 9 or 7.
```

22. WAP to identify gender in single character and print full gender (Ex: if input is 'M' or 'm' – it should print "Male").

ANS:

main.c

```c
#include <stdio.h>

int main() {
    char gender;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a single character for gender (M/F): ");
    scanf(" %c", &gender);

    if (gender == 'M' || gender == 'm') {
        printf("Gender: Male\n");
    } else if (gender == 'F' || gender == 'f') {
        printf("Gender: Female\n");
    } else {
        printf("Invalid input for gender.\n");
    }

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter a single character for gender (M/F): m
Gender: Male
```

23. Write a C program to print all natural numbers in reverse (from n to 1).

ANS:

main.c

```c
#include <stdio.h>

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

    if (n <= 0) {
        printf("Please enter a positive integer for n.\n");
    } else {
        printf("Natural numbers in reverse order from %d to 1:\n", n);
        for (int i = n; i >= 1; i--) {
            printf("%d ", i);
        }
        printf("\n");
    }

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter the value of n: 9
Natural numbers in reverse order from 9 to 1:
9 8 7 6 5 4 3 2 1
```

24. Write a C program to print all alphabets from a to z.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    char alphabet = 'a';
    printf("SHISHANT CHOUDHARY\n");
    printf("Alphabets from a to z: \n");

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

    printf("\n");

    return 0;
}
```

```
SHISHANT CHOUDHARY
Alphabets from a to z:
a b c d e f g h i j k l m n o p q r s t u v w x y z
```

25. Write a CWrite a C program to print all natural numbers from 1 to n.

ANS:

main.c

```c
#include <stdio.h>
int main() {
    int n;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a positive integer (n): ");
    scanf("%d", &n);

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

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

        printf("\n");
    }

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a positive integer (n): 9
Natural numbers from 1 to 9 are:
1 2 3 4 5 6 7 8 9
```

26. program to print all even numbers between 1 to 100.

ANS ;

```c
#include <stdio.h>

int main() {
    printf("SHISHANT CHOUDHARY\n");
    printf("Even numbers from 1 to 100:\n");

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

    printf("\n");

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Even numbers from 1 to 100:
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96
 98 100
```

27. Write a C program to print all odd number between 1 to 100.

ANS:

```c
#include <stdio.h>

int main() {
    printf("SHISHANT CHOUDHARY\n");
    printf("odd numbers from 1 to 100:\n");

    for (int i = 1; i <= 100; i += 2) {
        printf("%d ", i);
    }

    printf("\n");

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
odd numbers from 1 to 100:
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71 73 75 77 79 81 83 85 87 89 91 93 9
5 97 99
```

28. Write a C program to find sum of all natural numbers between 1 to n.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int n, sum = 0;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a positive integer n: ");
    scanf("%d", &n);

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

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a positive integer n: 9
The sum of natural numbers from 1 to 9 is: 45
```

29. Write a C program to find sum of all even numbers between 1 to n.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int n, sum = 0;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a positive integer n: ");
    scanf("%d", &n);

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

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a positive integer n: 8
The sum of even numbers from 1 to 8 is: 20
```

30. Write a C program to find sum of all odd numbers between 1 to n.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int n, sum = 0;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a positive integer n: ");
    scanf("%d", &n);

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

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a positive integer n: 9
The sum of odd numbers from 1 to 9 is: 25
```

31. Write a C program to print multiplication table of any number.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int number, i;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a number to print to a table: ");
    scanf("%d", &number);

    printf("table for %d:\n", number);


    for (i = 1; i <= 10; i++) {
        printf("%d x %d = %d\n", number, i, number * i);
    }

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter a number to print to a table: 5
table for 5:
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
```

32. Write a C program to count number of digits in a number.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int num, count = 0;

    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a number: ");
    scanf("%d", &num);

    if (num == 0) {
        count = 1;
    } else {
        while (num != 0) {
            count++;
            num /= 10;
        }
    }
    printf("The number of digits in a number is: %d\n", count);

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a number: 5
The number of digits in a number is: 1
```

33. Write a C program to find first and last digit of a number.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int number, firstDigit, lastDigit;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter an integer number: ");
    scanf("%d", &number);

    lastDigit = number % 10;

    while (number >= 10) {
        number /= 10;
    }
    firstDigit = number;

    printf("First digit: %d\n", firstDigit);
    printf("Last digit: %d\n", lastDigit);

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter an integer number: 6
First digit: 6
Last digit: 6
```

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

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int number, firstDigit, lastDigit, sum;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter an integer number: ");
    scanf("%d", &number);
    lastDigit = number % 10;

    while (number >= 10) {
        number /= 10;
    }
    firstDigit = number;

    sum = firstDigit + lastDigit;

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

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter an integer number: 23
The sum of the first and last digits is: 5
```

35. Write a C program to swap first and last digits of a number.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int number, originalNumber, swappedNumber;
    int lastDigit, firstDigit, digitsCount = 0, multiplier = 1;

    printf("SHISHANT CHOUDHARY\n");
    printf("Enter an integer: ");
    scanf("%d", &number);

    originalNumber = number;

    while (number != 0) {
        number /= 10;
        digitsCount++;
        multiplier *= 10;
    }

    number = originalNumber;

    lastDigit = number % 10;

    firstDigit = originalNumber / (multiplier / 10);

    // Swap the first and last digits
    swappedNumber = lastDigit;
    swappedNumber = swappedNumber * (multiplier / 10) + (originalNumber % (multiplier / 10));
    swappedNumber = swappedNumber - lastDigit + firstDigit;

    printf("Original number: %d\n", originalNumber);
    printf("Number after swapping first and last digits: %d\n", swappedNumber);

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter an integer: 48
Original number: 48
Number after swapping first and last digits: 84
```

36. Write a C program to calculate sum of digits of a number.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int number, firstDigit, lastDigit, sum;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter an integer number: ");
    scanf("%d", &number);
    lastDigit = number % 10;

    while (number >= 10) {
        number /= 10;
    }
    firstDigit = number;

    sum = firstDigit + lastDigit;

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

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter an integer number: 23
The sum of the first and last digits is: 5
```

37. Write a C program to calculate product of digits of a number.

ANS:

main.c

```c
#include <stdio.h>

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

    printf("SHISHANT CHOUDHARY\n");
    printf("Enter an integer: ");
    scanf("%d", &number);

    while (number != 0) {
        digit = number % 10;
        product *= digit;
        number /= 10;
    }
    printf("The product of the digits in %d\n", product);

    return 0;
}

```

input

```
SHISHANT CHOUDHARY
Enter an integer: 35
The product of the digits in 15
```

38. Write a C program to enter a number and print its reverse.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int number, reverse = 0, remainder;
    printf("SHISHANTCHOUDHARY\n");
    printf("Enter a number: ");
    scanf("%d", &number);

    while (number > 0) {
        remainder = number % 10;
        reverse = reverse * 10 + remainder;
        number /= 10;
    }
    printf("The reverse of the number is: %d\n", reverse);

    return 0;
}

```

input

```
SHISHANTCHOUDHARY
Enter a number: 67
The reverse of the number is: 76
```

39. Write a C program to check whether a number is palindrome or not.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int number, reversedNumber = 0, originalNumber, remainder;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter an integer: ");
    scanf("%d", &number);

    originalNumber = number;

    while (number > 0) {
        remainder = number % 10;
        reversedNumber = reversedNumber * 10 + remainder;
        number /= 10;
    }
    if (originalNumber == reversedNumber) {
        printf("%d is a palindrome number.\n", originalNumber);
    } else {
        printf("%d is not a palindrome number.\n", originalNumber);
    }

    return 0;
```

input

```
SHISHANT CHOUDHARY
Enter an integer: 232
232 is a palindrome number.
```

40. Write a C program to find frequency of each digit in a given integer.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int number;
    int digitFrequency[10] = {0};
    printf("SHISHNAT CHPOUDHARY\n");
    printf("Enter an integer: ");
    scanf("%d", &number);

    while (number != 0) {
        int digit = number % 10;
        digitFrequency[digit]++;
        number /= 10;
    }
    printf("Digit frequencies in the integer:\n");
    for (int i = 0; i < 10; i++) {
        if (digitFrequency[i] > 0) {
            printf("Digit %d: %d times\n", i, digitFrequency[i]);
        }
    }

    return 0;
}
```

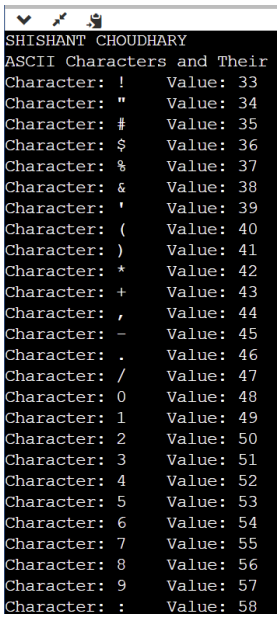
```
SHISHNAT CHPOUDHARY
Enter an integer: 45
Digit frequencies in the integer:
Digit 4: 1 times
Digit 5: 1 times
```

42. Write a C program to print all ASCII character with their values.

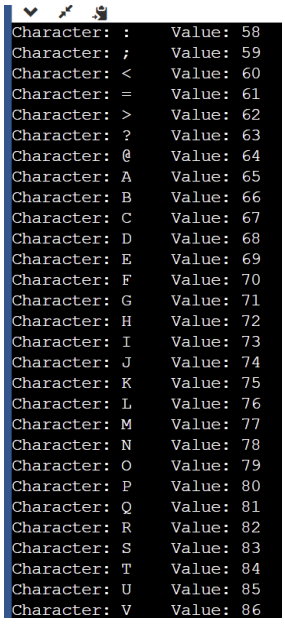
ANS:

main.c

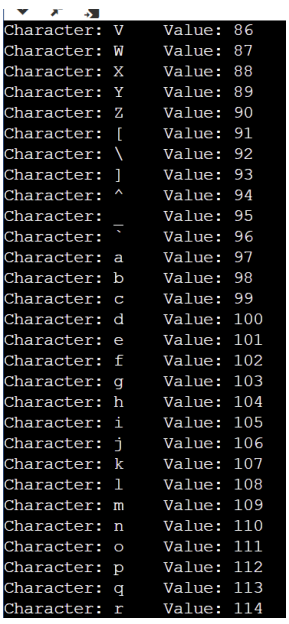
```c
#include <stdio.h>

int main() {
    printf("SHISHANT CHOUDHARY\n");
    printf("ASCII Characters and Their Values:");

    for (int i = 32; i < 128; i++) {
        printf("Character: %c\tValue: %d\n", i, i);
    }

    return 0;
}
```



```
SHISHANT CHOUDHARY
ASCII Characters and Their
Character: !    Value: 33
Character: "    Value: 34
Character: #    Value: 35
Character: $    Value: 36
Character: %    Value: 37
Character: &    Value: 38
Character: '    Value: 39
Character: (    Value: 40
Character: )    Value: 41
Character: *    Value: 42
Character: +    Value: 43
Character: ,    Value: 44
Character: -    Value: 45
Character: .    Value: 46
Character: /    Value: 47
Character: 0    Value: 48
Character: 1    Value: 49
Character: 2    Value: 50
Character: 3    Value: 51
Character: 4    Value: 52
Character: 5    Value: 53
Character: 6    Value: 54
Character: 7    Value: 55
Character: 8    Value: 56
Character: 9    Value: 57
Character: :    Value: 58
```



```
Character: :    Value: 58
Character: ;    Value: 59
Character: <    Value: 60
Character: =    Value: 61
Character: >    Value: 62
Character: ?    Value: 63
Character: @    Value: 64
Character: A    Value: 65
Character: B    Value: 66
Character: C    Value: 67
Character: D    Value: 68
Character: E    Value: 69
Character: F    Value: 70
Character: G    Value: 71
Character: H    Value: 72
Character: I    Value: 73
Character: J    Value: 74
Character: K    Value: 75
Character: L    Value: 76
Character: M    Value: 77
Character: N    Value: 78
Character: O    Value: 79
Character: P    Value: 80
Character: Q    Value: 81
Character: R    Value: 82
Character: S    Value: 83
Character: T    Value: 84
Character: U    Value: 85
Character: V    Value: 86
```



```
Character: V    Value: 86
Character: W    Value: 87
Character: X    Value: 88
Character: Y    Value: 89
Character: Z    Value: 90
Character: [    Value: 91
Character: \    Value: 92
Character: ]    Value: 93
Character: ^    Value: 94
Character: _    Value: 95
Character: `    Value: 96
Character: a    Value: 97
Character: b    Value: 98
Character: c    Value: 99
Character: d    Value: 100
Character: e    Value: 101
Character: f    Value: 102
Character: g    Value: 103
Character: h    Value: 104
Character: i    Value: 105
Character: j    Value: 106
Character: k    Value: 107
Character: l    Value: 108
Character: m    Value: 109
Character: n    Value: 110
Character: o    Value: 111
Character: p    Value: 112
Character: q    Value: 113
Character: r    Value: 114
```

43. Write a C program to find power of a number using for loop.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    float base, exponent, result = 1;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the base: ");
    scanf("%f", &base);

    printf("Enter the exponent: ");
    scanf("%f", &exponent);

    for (int i = 1; i <= exponent; i++) {
        result *= base;
    }

    // Display the result
    printf("%f ^ %.f = %f\n", base, exponent, result);

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter the base: 4
Enter the exponent: 6
4.000000 ^ 6 = 4096.000000
```

44. Write a C program to find all factors of a number.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int number;

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

    printf("Factors of %d are: ", number);

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

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a positive integer: 24
Factors of 24 are: 1 2 3 4 6 8 12 24
```

45. Write a C program to calculate factorial of a number

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int number;
    unsigned long long factorial = 1;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a non-negative integer: ");
    scanf("%d", &number);

    if (number < 0) {
        printf("Factorial is not defined for negative numbers.\n");
    } else {
        for (int i = 1; i <= number; i++) {
            factorial *= i;
        }

        printf("Factorial of %d = %llu\n", number, factorial);
    }

    return 0;
}

```

input

```
SHISHANT CHOUDHARY
Enter a non-negative integer: 24
Factorial of 24 = 10611558092380307456
```

46. Write a C program to find HCF (GCD) of two numbers.

ANS:

main.c

```c
#include <stdio.h>

int calculateHCF(int num1, int num2) {
    while (num1 != num2) {
        if (num1 > num2)
            num1 -= num2;
        else
            num2 -= num1;
    }
    return num1;
}
int main() {
    int number1, number2;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the first number: ");
    scanf("%d", &number1);

    printf("Enter the second number: ");
    scanf("%d", &number2);

    int hcf = calculateHCF(number1, number2);
    printf("The HCF/GCD of %d and %d is %d\n", number1, number2, hcf);

    return 0;
}
```

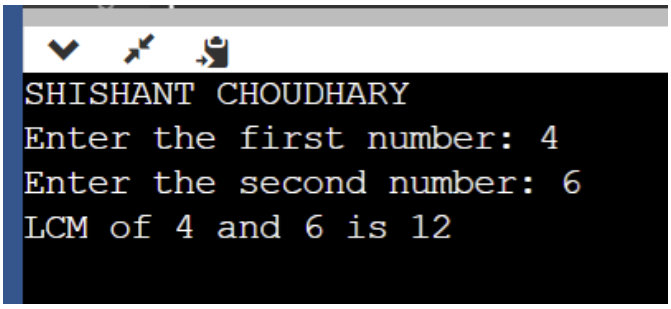
```
SHISHANT CHOUDHARY
Enter the first number: 8
Enter the second number: 9
The HCF/GCD of 8 and 9 is 1
```

47. Write a C program to find LCM of two numbers.

ANS:

main.c

```c
#include <stdio.h>

int gcd(int a, int b) {
    if (b == 0) {
        return a;
    }
    return gcd(b, a % b);
}
int lcm(int a, int b) {
    return (a * b) / gcd(a, b);
}

int main() {
    int num1, num2;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the first number: ");
    scanf("%d", &num1);
    printf("Enter the second number: ");
    scanf("%d", &num2);

    int result = lcm(num1, num2);
    printf("LCM of %d and %d is %d\n", num1, num2, result);

    return 0;
}
```



48. Write a C program to check whether a number is Prime number or not.

ANS:

main.c

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

bool isPrime(int number) {
    if (number <= 1) {
        return false;
    }
     for (int i = 2; i * i <= number; i++) {
        if (number % i == 0) {
            return false;
        }
    }
     return true;
}
int main() {
    int num;
    printf("Enter a positive integer: ");
    scanf("%d", &num);

    if (isPrime(num)) {
        printf("%d is a prime number.\n");
    } else {
        printf("%d is not a prime number.\n");
    }

    return 0;
```

50. Write a C program to find sum of all prime numbers between 1 to n.

ANS:

main.c

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

bool isPrime(int num) {
    if (num <= 1) {
        return false;
    }
    for (int i = 2; i * i <= num; i++) {
        if (num % i == 0) {
            return false;
        }
    }
    return true;
}

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

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

    for (int i = 2; i <= n; i++) {
        if (isPrime(i)) {
            sum += i;
        }
    }
    printf("Sum of prime numbers from 1 to %d is %d\n", n, sum);

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a positive integer (n): 5
Sum of prime numbers from 1 to 5 is 10
```

51. Write a C program to find all prime factors of a number.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int num;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a prime number: ");
    scanf("%d", &num);
    if (num < 2) {
        printf("Prime numbers must be greater than or equal to 2");
    } else {
        printf("Factors of %d are:", num);
        for (int i = 1; i <= num; i++) {
            if (num % i == 0) {
                printf("%d", i);
            }
        }
    }

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a prime number: 8
Factors of 8 are:1248
```

52. Write a C program to check whether a number is Armstrong number or not.

ANS:

main.c

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

int main() {
    int number, originalNumber, remainder, result = 0;
    int n = 0;

    printf("SHISHANT CHOUDHARY\n");
    printf("Enter an integer: ");
    scanf("%d", &number);

    originalNumber = number;

    while (originalNumber != 0) {
        originalNumber /= 10;
        n++;
    }
```

```
18
19      originalNumber = number;
20
21      while (originalNumber != 0) {
22          remainder = originalNumber % 10;
23          result += pow(remainder, n);
24          originalNumber /= 10;
25      }
26      if (result == number) {
27          printf("%d is an Armstrong number.\n", number);
28      } else {
29          printf("%d is not an Armstrong number.\n", number);
30      }
31
32      return 0;
33  }
34
```

input

```
SHISHANT CHOUDHARY
Enter an integer: 153
153 is an Armstrong number.
```

53. Write a C program to print all Armstrong numbers between 1 to n.

ANS:

main.c

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

int countDigits(int num) {
    int count = 0;
    while (num > 0) {
        num /= 10;
        count++;
    }
    return count;
}

int isArmstrong(int num) {
    int originalNum, remainder, n, result = 0;
    originalNum = num;
    n = countDigits(num);

    while (originalNum != 0) {
        remainder = originalNum % 10;
        result += pow(remainder, n);
        originalNum /= 10;
    }

    return (result == num);
}
```

```c
int main() {
    int n;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the value of n: ");
    scanf("%d", &n);

    printf("Armstrong numbers from 1 to %d are:\n", n);

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

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter the value of n: 1000
Armstrong numbers from 1 to 1000 are:
1
2
3
4
5
6
7
8
9
153
370
371
407
```

54. Write a C program to check whether a number is Perfect number or not.

ANS:

main.c

```c
#include <stdio.h>

int isPerfect(int num) {
    int sum = 1;

    for (int i = 2; i * i <= num; i++) {
        if (num % i == 0) {
            sum += i;
            if (i != num / i) {
                sum += num / i;
            }
        }
    }

    return (sum == num);
}
```

main.c

```c
int main() {
    int number;

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

    if (number <= 0) {
        printf("Please enter a positive integer.\n");
    } else {
        if (isPerfect(number)) {
            printf("%d is a perfect number.\n", number);
        } else {
            printf("%d is not a perfect number.\n", number);
        }
    }

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a positive integer: 28
28 is a perfect number.
```

55. Write a C program to print all Perfect numbers between 1 to n.

ANS:

main.c

```c
#include <stdio.h>

int isPerfect(int num) {
    int sum = 1;

    for (int i = 2; i * i <= num; i++) {
        if (num % i == 0) {
            if (i * i != num) {
                sum = sum + i + (num / i);
            } else {
                sum = sum + i;
            }
        }
    }

    return sum == num;
}

int main() {
    int n;

    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the value of 'n': ");
    scanf("%d", &n);

    printf("Perfect numbers from 1 to %d are:\n", n);

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

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter the value of 'n': 50
Perfect numbers from 1 to 50 are:
1
6
28
```

56. Write a C program to check whether a number is Strong number or not.

ANS:

main.c

```c
#include <stdio.h>

int factorial(int n) {
    int result = 1;
    for (int i = 2; i <= n; i++) {
        result *= i;
    }
    return result;
}
int isStrongNumber(int num) {
    int originalNum = num;
    int sum = 0;

    while (num > 0) {
        int digit = num % 10;
        sum += factorial(digit);
        num /= 10;
    }

    return (sum == originalNum);
}

```

```c

int main() {
    int number;

    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a number: ");
    scanf("%d", &number);

    if (isStrongNumber(number)) {
        printf("%d is a strong number.\n", number);
    } else {
        printf("%d is not a strong number.\n", number);
    }

    return 0;
}

```

input

```
SHISHANT CHOUDHARY
Enter a number: 145
145 is a strong number.
```

57. Write a C program to print all Strong numbers between 1 to n.

ANS:

main.c

```c
#include <stdio.h>

int factorial(int num) {
    int fact = 1;
    for (int i = 1; i <= num; i++) {
        fact *= i;
    }
    return fact;
}
int isStrongNumber(int num) {
    int originalNum = num;
    int sum = 0;

    while (num > 0) {
        int digit = num % 10;
        sum += factorial(digit);
        num /= 10;
    }

    return sum == originalNum;
}
```

main.c

```c

int main() {
    int n;

    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the value of n: ");
    scanf("%d", &n);

    printf("Strong numbers from 1 to %d are:\n", n);

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

    return 0;
}
```

input

```
Enter the value of n: 50
Strong numbers from 1 to 50 are:
1
2
```

58. Write a C program to print Fibonacci series up to n terms.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int n, first = 0, second = 1, next;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the number of terms: ");
    scanf("%d", &n);

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

    for (int i = 0; i < n; i++) {
        if (i <= 1) {
            next = i;
        } else {
            next = first + second;
            first = second;
            second = next;
        }
        printf("%d ", next);
    }

    printf("\n");

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter the number of terms: 4
Fibonacci Series up to 4 terms:
0 1 1 2
```

59. Write a C program to find one's complement of a binary number.

ANS:

ain.c

Ctrl+S

```c
#include <stdio.h>

int main() {
    unsigned int binaryNumber, onesComplement;

    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a binary number: ");
    scanf("%u", &binaryNumber);

    onesComplement = ~binaryNumber;

    printf("One's Complement of %u in binary: ", binaryNumber);

    int numBits = sizeof(binaryNumber) * 8;

    for (int i = numBits - 1; i >= 0; i--) {
        int bit = (onesComplement >> i) & 1;
        printf("%d", bit);
    }

    printf("\n");

    return 0;
}
```

61. Write a C program to convert Binary to Octal number system.

ANS:

main.c

```c
#include <stdio.h>

int binaryToOctal(long long binaryNumber) {
    int octalNumber = 0, decimalNumber = 0, base = 1;

    while (binaryNumber > 0) {
        int lastDigit = binaryNumber % 10;
        decimalNumber += lastDigit * base;
        binaryNumber /= 10;
        base *= 2;
    }

    base = 1;

    while (decimalNumber > 0) {
        int lastDigit = decimalNumber % 8;
        octalNumber += lastDigit * base;
        decimalNumber /= 8;
        base *= 10;
    }

    return octalNumber;
}
```

main.c

```c
    return octalNumber;
}

int main() {
    long long binaryNumber;

    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a binary number: ");
    scanf("%lld", &binaryNumber);

    if (binaryNumber < 0) {
        printf("Invalid input. Please enter a non-negative binary number.\n");
    } else {
        int octalNumber = binaryToOctal(binaryNumber);
        printf("Octal equivalent: %d\n", octalNumber);
    }

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a binary number: 0101
Octal equivalent: 5
```

62. Write a C program to convert Binary to Decimal number system.

ANS:

main.c

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

int main() {
    unsigned long long binaryNumber;
    int decimalNumber = 0, digit, bitPosition = 0;

    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a binary number: ");
    scanf("%llu", &binaryNumber);

    while (binaryNumber > 0) {
        digit = binaryNumber % 10;  /
        decimalNumber += digit * pow(2, bitPosition);
        binaryNumber /= 10;
        bitPosition++;
    }

    printf("Decimal equivalent: %d\n", decimalNumber);

    return 0;
}
```

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

63. Write a C program to convert Binary to Hexadecimal number system.

ANS:

main.c

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

char* binaryToHexadecimal(const char* binary) {

    int length = strlen(binary);
    int pad = 4 - (length % 4);
    char paddedBinary[4 * ((length + pad) / 4) + 1];
    strcpy(paddedBinary, "");
    while (pad > 0) {
        strcat(paddedBinary, "0");
        pad--;
    }
    strcat(paddedBinary, binary);

    const char* binaryLookup[16] = {
        "0000", "0001", "0010", "0011",
        "0100", "0101", "0110", "0111",
        "1000", "1001", "1010", "1011",
        "1100", "1101", "1110", "1111"
    };

    char* hexadecimal = (char*)malloc((strlen(paddedBinary)
    strcpy(hexadecimal, "");
```

```
    strcpy(hexadecimal, "");

    for (int i = 0; i < strlen(paddedBinary); i += 4) {
        char nibble[5];
        strncpy(nibble, paddedBinary + i, 4);
        nibble[4] = '\0';

        for (int j = 0; j < 16; j++) {
            if (strcmp(nibble, binaryLookup[j]) == 0) {
                char hexChar = (j < 10) ? ('0' + j) : ('A' +
                strncat(hexadecimal, &hexChar, 1);
                break;
            }
        }
    }

    return hexadecimal;
}
```

```
int main() {
    char binary[100];

    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a binary number: ");
    scanf("%s", binary);

    char* hexadecimal = binaryToHexadecimal(binary);

    printf("Hexadecimal representation: %s\n", hexadecimal);

    free(hexadecimal);

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a binary number: 1100
Hexadecimal representation: 0C
```

64. Write a C program to convert Octal to Binary number system.

ANS:

nain.c

```c
#include <stdio.h>

void octalToBinary(char octalDigit) {
    int octalValue = octalDigit - '0';
    int binary[3];

    for (int i = 2; i >= 0; i--) {
        binary[i] = octalValue % 2;
        octalValue /= 2;
    }
    for (int i = 0; i < 3; i++) {
        printf("%d", binary[i]);
    }
}
```

```c

int main() {
    char octal[10];
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter an octal number: ");
    scanf("%s", octal);

    printf("Binary equivalent: ");
    for (int i = 0; octal[i] != '\0'; i++) {
        octalToBinary(octal[i]);
    }

    printf("\n");

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter an octal number: 7
Binary equivalent: 111
```

65. Write a C program to convert Octal to Decimal number system.

ANS:

nain.c

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

int octalToDecimal(int octalNumber) {
    int decimalNumber = 0, i = 0;

    while (octalNumber != 0) {
        int remainder = octalNumber % 10;
        decimalNumber += remainder * pow(8, i);
        ++i;
        octalNumber /= 10;
    }

    return decimalNumber;
}
```

```c

int main() {
    int octalNumber;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter an octal number: ");
    scanf("%o", &octalNumber);

    int decimalNumber = octalToDecimal(octalNumber);

    printf("Decimal equivalent: %d\n", decimalNumber);

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter an octal number: 6
Decimal equivalent: 6
```

66. Write a C program to convert Octal to Hexadecimal number system.

ANS:

main.c

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

int octalToDecimal(int octal) {
    int decimal = 0, i = 0;

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

    return decimal;
}
void decimalToHexadecimal(int decimal) {
    char hexadecimal[100];
    int i = 0;

    while (decimal != 0) {
        int remainder = decimal % 16;
        if (remainder < 10) {
            hexadecimal[i] = remainder + '0';
        } else {
            hexadecimal[i] = remainder - 10 + 'A';
```

```c
        }
        i++;
        decimal /= 16;
    }

    printf("Hexadecimal: ");
    for (int j = i - 1; j >= 0; j--) {
        printf("%c", hexadecimal[j]);
    }
    printf("\n");
}

int main() {
    int octal;
    peintf("SHISHANT CHOUDHARY\n");
    printf("Enter an octal number: ");
    scanf("%o", &octal);

    int decimal = octalToDecimal(octal);

    decimalToHexadecimal(decimal);

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter an octal number: 6
Hexadecimal: 6
```

67. Write a C program to convert Decimal to Binary number system.

ANS

:

main.c

```c
#include <stdio.h>

void decimalToBinary(int decimal) {
    if (decimal == 0) {
        printf("SHISHANT CHOUDHARY\n");
        printf("Binary: 0\n");
        return;
    }

    int binary[32];
    int i = 0;

    while (decimal > 0) {
        binary[i] = decimal % 2;
        decimal /= 2;
        i++;
    }

    printf("Binary: ");
    for (int j = i - 1; j >= 0; j--) {
        printf("%d", binary[j]);
    }
    printf("\n");
}
```

```c
int main() {
    int decimalNumber;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a decimal number: ");
    scanf("%d", &decimalNumber);

    decimalToBinary(decimalNumber);

    return 0;
}
```

input

```
Enter a decimal number: 6
Binary: 110
```

68. Write a C program to convert Decimal to Octal number system.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int decimalNumber;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a decimal number: ");
    scanf("%d", &decimalNumber);

    int octalNumber = 0;
    int placeValue = 1;

    while (decimalNumber > 0) {
        int remainder = decimalNumber % 8;
        octalNumber += remainder * placeValue;
        placeValue *= 10;
        decimalNumber /= 8;
    }

    printf("Octal equivalent: %d\n", octalNumber);

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter a decimal number: 7
Octal equivalent: 7
```

69. Write a C program to convert Decimal to Hexadecimal number system.

ANS:

ain.c

```c
#include <stdio.h>

int main() {
    int decimalNumber;

    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a decimal number: ");
    scanf("%d", &decimalNumber);

    if (decimalNumber < 0) {
        printf("Please enter a non-negative decimal number.\n");
        return 1;
    }

    printf("Hexadecimal representation: %d\n", decimalNumber);

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a decimal number: 7
Hexadecimal representation: 7
```

70. Write a C program to convert Hexadecimal to Binary number system.

ANS:

main.c

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

const char* hexToBin(char c) {
    switch(c) {
        case '0': return "0000";
        case '1': return "0001";
        case '2': return "0010";
        case '3': return "0011";
        case '4': return "0100";
        case '5': return "0101";
        case '6': return "0110";
        case '7': return "0111";
        case '8': return "1000";
        case '9': return "1001";
        case 'A': case 'a': return "1010";
        case 'B': case 'b': return "1011";
        case 'C': case 'c': return "1100";
        case 'D': case 'd': return "1101";
        case 'E': case 'e': return "1110";
        case 'F': case 'f': return "1111";
        default: return "Invalid Hex Digit";
    }
```

main.c

```c
}

int main() {
    char hex[20];
    char binary[80];

    printf("Enter a hexadecimal number: ");
    scanf("%s", hex);

    int len = strlen(hex);
    int binaryIndex = 0;

    for (int i = 0; i < len; i++) {
        const char* bin = hexToBin(hex[i]);

        if (strcmp(bin, "Invalid Hex Digit") == 0) {
            printf("Invalid hexadecimal digit: %c\n", hex[i]);
            return 1;
        }

        for (int j = 0; j < 4; j++) {
            binary[binaryIndex++] = bin[j];
        }
```

```c
        }

        for (int j = 0; j < 4; j++) {
            binary[binaryIndex++] = bin[j];
        }
    }

    binary[binaryIndex] = '\0';

    printf("Binary representation: %s\n", binary);

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a hexadecimal number: 2a
Binary representation: 00101010
```

71. Write a C program to convert Hexadecimal to Octal number system.

ANS:

main.c

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

int hexToDecimal(char hexDigit) {
    if (hexDigit >= '0' && hexDigit <= '9') {
        return hexDigit - '0';
    } else if (hexDigit >= 'A' && hexDigit <= 'F') {
        return hexDigit - 'A' + 10;
    } else if (hexDigit >= 'a' && hexDigit <= 'f') {
        return hexDigit - 'a' + 10;
    }
    return -1;
}
void decimalToOctal(int decimalNumber) {
    int octalNumber = 0, i = 1;

    while (decimalNumber > 0) {
        octalNumber += (decimalNumber % 8) * i;
        decimalNumber /= 8;
        i *= 10;
    }

    printf("Equivalent octal number: %d\n", octalNumber);
}
```

main.c

```c
int main() {
    char hexValue[20];
    int decimalValue = 0;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a hexadecimal number: ");
    scanf("%s", hexValue);

    for (int i = 0; hexValue[i] != '\0'; i++) {
        int decimalDigit = hexToDecimal(hexValue[i]);
        if (decimalDigit == -1) {
            printf("Invalid hexadecimal digit: %c\n", hexValue[i]);
            return 1;
        }
        decimalValue = decimalValue * 16 + decimalDigit;
    }
    decimalToOctal(decimalValue);

    return 0;
}

```

input

```
SHISHANT CHOUDHARY
Enter a hexadecimal number: 2e
Equivalent octal number: 56
```

If else exercise

1.Write a C program to find maximum between two numbers.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    float num1, num2, max;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the first number: ");
    scanf("%f", &num1);

    printf("Enter the second number: ");
    scanf("%f", &num2);

    if (num1 > num2) {
        max = num1;
    } else {
        max = num2;
    }
    printf("The maximum number is: %.f\n", max);

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter the first number: 4
Enter the second number: 6
The maximum number is: 6
```

2. Write a C program to find maximum between three numbers.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int num1, num2, num3, max;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the first number: ");
    scanf("%d", &num1);

    printf("Enter the second number: ");
    scanf("%d", &num2);

    printf("Enter the third number: ");
    scanf("%d", &num3);

    max = num1;
    if (num2 > max) {
        max = num2;
    }
    if (num3 > max) {
        max = num3;
    }
    printf("The maximum number is: %d\n", max);

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter the first number: 4
Enter the second number: 6
Enter the third number: 8
The maximum number is: 8
```

3. Write a C program to check whether a number is negative, positive or zero.

main.c

```c
#include <stdio.h>

int main() {
    int number;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a number: ");
    scanf("%d", &number);

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

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a number: 6
The number is positive.
```

4. Write a C program to check whether a number is divisible by 5 and 11 or not.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int number;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a number: ");
    scanf("%d", &number);

    if (number % 5 == 0 && number % 11 == 0) {
        printf("%d is divisible by both 5 and 11.\n", number);
    } else {
        printf("%d is not divisible by both 5 and 11.\n", number);
    }

    return 0;
}

```

input

```
SHISHANT CHOUDHARY
Enter a number: 55
55 is divisible by both 5 and 11.
```

1. Write a C program to check whether a number is even or odd.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int number;
    printf("SHISHANTCHOUDHARY\n");
    printf("Enter an integer: ");
    scanf("%d", &number);

    if (number % 2 == 0) {
        printf("%d is an even number.\n", number);
    } else {
        printf("%d is an odd number.\n", number);
    }

    return 0;
}

```

input

```
SHISHANTCHOUDHARY
Enter an integer: 6
6 is an even number.
```

2. Write a C program to check whether a year is leap year or not.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int year;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a year: ");
    scanf("%d", &year);

    if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
        printf("%d is a leap year.\n", year);
    } else {
        printf("%d is not a leap year.\n", year);
    }

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a year: 2012
2012 is a leap year.
```

3. **Write a C program to check whether a character is alphabet or not.**

ANS:

main.c

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

int main() {
    char ch;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a character: ");
    scanf(" %c", &ch);

    if (isalpha(ch)) {
        printf("%c is an alphabet.\n", ch);
    } else {
        printf("%c is not an alphabet.\n", ch);
    }

    return 0;
}

```

input

```
SHISHANT CHOUDHARY
Enter a character: t
t is an alphabet.
```

4. **Write a C program to input any alphabet and check whether it is vowel or consonant.**

ANS:

main.c

```c
#include <stdio.h>

int main() {
    char ch;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a single alphabet character: ");
    scanf(" %c", &ch);

    if ((ch >= 'a' && ch <= 'z') || (ch >= 'A' && ch <= 'Z')) {
        if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u' ||
            ch == 'A' || ch == 'E' || ch == 'I' || ch == 'O' || ch == 'U') {
            printf("%c is a vowel.\n", ch);
        } else {
            printf("%c is a consonant.\n", ch);
        }
    } else {
        printf("Invalid input. Please enter a single alphabet character.\n");
    }

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a single alphabet character: a
a is a vowel.
```

5. **Write a C program to input any character and check whether it is alphabet, digit or special character.**

ANS:

main.c

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

int main() {
    char character;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a character: ");
    scanf(" %c", &character);

    if (isalpha(character)) {
        printf("%c is an alphabet.\n", character);
    } else if (isdigit(character)) {
        printf("%c is a digit.\n", character);
    } else {
        printf("%c is a special symbol.\n", character);
    }

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a character: &
& is a special symbol.
```

6. **Write a C program to check whether a character is uppercase or lowercase alphabet.**

ANS:

main.c

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

int main() {
    char ch;
    printf("SHISHNAT CHOUDHARY\n");
    printf("Enter a character: ");
    scanf(" %c", &ch);

    if (isupper(ch)) {
        printf("%c is an uppercase letter.\n", ch);
    } else if (islower(ch)) {
        printf("%c is a lowercase letter.\n", ch);
    } else {
        printf("%c is not an alphabet character.\n", ch);
    }

    return 0;
}

```

input

```
SHISHNAT CHOUDHARY
Enter a character: A
A is an uppercase letter.
```

7. **Write a C program to input week number and print week day.**

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int weekNumber;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a week number (1-7): ");
    scanf("%d", &weekNumber);

    switch (weekNumber) {
        case 1:
            printf("Day of the week: Sunday\n");
            break;
        case 2:
            printf("Day of the week: Monday\n");
            break;
        case 3:
            printf("Day of the week: Tuesday\n");
            break;
        case 4:
            printf("Day of the week: Wednesday\n");
            break;
        case 5:
            printf("Day of the week: Thursday\n");
            break;
        case 6:
            printf("Day of the week: Friday\n");
            break;
        case 7:
            printf("Day of the week: Saturday\n");
            break;
        default:
            printf("Invalid week number. Please enter a number between 1 and 7.\n");
    }

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter a week number (1-7): 4
Day of the week: Wednesday
```

8. **Write a C program to input month number and print number of days in that month.**

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int month;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter a month number (1-12): ");
    scanf("%d", &month);

    switch (month) {
        case 1: case 3: case 5: case 7: case 8: case 10: case 12:
            printf("Number of days: 31\n");
            break;
        case 4: case 6: case 9: case 11:
            printf("Number of days: 30\n");
            break;
        case 2:
            printf("Number of days: 28 or 29 (leap year)\n");
            break;
        default:
            printf("Invalid month number. Please enter a number between 1 and 12.\n");
    }

    return 0;
}

```

```
SHISHANT CHOUDHARY
Enter a month number (1-12): 11
Number of days: 30
```

9. **Write a C program to count total number of notes in given amount.**

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int amount, notes;

    printf("SHISHNAT CHOUDHARY\n");
    printf("Enter the amount: ");
    scanf("%d", &amount);

    if (amount <= 0) {
        printf("Invalid amount. Please enter a positive amount.\n");
    } else {
        printf("Total number of notes for amount %d:\n", amount);

        notes = amount / 100;
        if (notes > 0) {
            printf("100-rupee notes: %d\n", notes);
            amount = amount % 100;
        }
        notes = amount / 50;
        if (notes > 0) {
            printf("50-rupee notes: %d\n", notes);
            amount = amount % 50;
        }
        notes = amount / 20;
        if (notes > 0) {
            printf("20-rupee notes: %d\n", notes);
            amount = amount % 20;
        }
        notes = amount / 10;
        if (notes > 0) {
            printf("10-rupee notes: %d\n", notes);
            amount = amount % 10;
        }
        notes = amount / 5;
        if (notes > 0) {
            printf("5-rupee notes: %d\n", notes);
            amount = amount % 5;
        }
        printf("1-rupee notes: %d\n", amount);
    }

    return 0;
}
```

:

16. Write a C program to input angles of a triangle and check whether triangle is valid or not.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    float angle1, angle2, angle3;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the three angles of the triangle: ");
    scanf("%f %f %f", &angle1, &angle2, &angle3);

    if (angle1 + angle2 + angle3 == 180 && angle1 > 0 && angle2 > 0 && angle3 > 0) {
        printf("The angles form a valid triangle.\n");
    } else {
        printf("The angles do not form a valid triangle.\n");
    }

    return 0;
}

```

input

```
SHISHANT CHOUDHARY
Enter the three angles of the triangle: 30 70 80
The angles form a valid triangle.
```

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

ANS:

main.c

```c
#include <stdio.h>

int main() {
    double side1, side2, side3;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the length of the first side: ");
    scanf("%lf", &side1);
    printf("Enter the length of the second side: ");
    scanf("%lf", &side2);
    printf("Enter the length of the third side: ");
    scanf("%lf", &side3);

    if (side1 + side2 > side3 && side1 + side3 > side2 && side2 + side3 > side1) {
        printf("It is a valid triangle.\n");
    } else {
        printf("It is not a valid triangle.\n");
    }

    return 0;
}
```

input

```
SHISHANT CHOUDHARY
Enter the length of the first side: 12
Enter the length of the second side: 6
Enter the length of the third side: 9
It is a valid triangle.
```

19. Write a C program to find all roots of a quadratic equation.

ANS:

main.c

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

int main() {
    double a, b, c;
    double discriminant, root1, root2;

    printf("SHISHANT CHOUHARY\n");
    printf("Enter the coefficient a: ");
    scanf("%lf", &a);
    printf("Enter the coefficient b: ");
    scanf("%lf", &b);
    printf("Enter the coefficient c: ");
    scanf("%lf", &c);


    discriminant = (b * b) - (4 * a * c);

    if (discriminant > 0) {
        root1 = (-b + sqrt(discriminant)) / (2 * a);
        root2 = (-b - sqrt(discriminant)) / (2 * a);
        printf("Root 1 = %.2lf\n", root1);
        printf("Root 2 = %.2lf\n", root2);
    } else if (discriminant == 0) {
        root1 = -b / (2 * a);
        printf("Root 1 = Root 2 = %.2lf\n", root1);
    } else {
        // Complex roots
        double realPart = -b / (2 * a);
        double imaginaryPart = sqrt(-discriminant) / (2 * a);
        printf("Root 1 = %.2lf + %.2lfi\n", realPart, imaginaryPart);
        printf("Root 2 = %.2lf - %.2lfi\n", realPart, imaginaryPart);
    }

    return 0;
}
```

input

```
SHISHANT CHOUHARY
Enter the coefficient a: 4
Enter the coefficient b: 7
Enter the coefficient c: 9
Root 1 = -0.88 + 1.22i
Root 2 = -0.88 - 1.22i
```

20. Write a C program to calculate profit or loss.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    float costPrice, sellingPrice, profitLoss;

    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the cost price: $");
    scanf("%f", &costPrice);

    printf("Enter the selling price: $");
    scanf("%f", &sellingPrice);

    profitLoss = sellingPrice - costPrice;

    if (profitLoss > 0) {
        printf("You made a profit of $%.2f.\n", profitLoss);
    } else if (profitLoss < 0) {
        printf("You incurred a loss of $%.2f.\n", -profitLoss);
    } else {
        printf("No profit, no loss.\n");
    }

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter the cost price: $300
Enter the selling price: $400
You made a profit of $100.00.
```

21. Write a C program 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

ANS:

main.c

```c
#include <stdio.h>

int main() {
    float physics, chemistry, biology, mathematics, computer;
    float total_marks, percentage;
    char grade;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter marks for Physics: ");
    scanf("%f", &physics);

    printf("Enter marks for Chemistry: ");
    scanf("%f", &chemistry);

    printf("Enter marks for Biology: ");
    scanf("%f", &biology);

    printf("Enter marks for Mathematics: ");
    scanf("%f", &mathematics);

    printf("Enter marks for Computer: ");
    scanf("%f", &computer);

    total_marks = physics + chemistry + biology + mathematics + computer;
    percentage = (total_marks / 500) * 100;

```

```
    if (percentage >= 90) {
        grade = 'A';
    } else if (percentage >= 80) {
        grade = 'B';
    } else if (percentage >= 70) {
        grade = 'C';
    } else if (percentage >= 60) {
        grade = 'D';
    } else if (percentage >= 40) {
        grade = 'E';
    } else {
        grade = 'F';
    }

    printf("Total Marks: %.2f\n", total_marks);
    printf("Percentage: %.2f%%\n", percentage);
    printf("Grade: %c\n", grade);

    return 0;
}
```

:

```
SHISHANT CHOUDHARY
Enter marks for Physics: 45
Enter marks for Chemistry: 90
Enter marks for Biology: 78
Enter marks for Mathematics: 90
Enter marks for Computer: 88
Total Marks: 391.00
Percentage: 78.20%
Grade: C
```

22. Write a C program 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%

ANS:

main.c

```c
#include <stdio.h>

int main() {
    float basicSalary, grossSalary;
    float hra, da;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the basic salary: ");
    scanf("%f", &basicSalary);

    if (basicSalary <= 10000) {
        hra = 0.2 * basicSalary;
        da = 0.8 * basicSalary;
    } else if (basicSalary <= 20000) {
        hra = 0.25 * basicSalary;
        da = 0.9 * basicSalary;
    } else {
        hra = 0.3 * basicSalary;
        da = 0.95 * basicSalary;
    }

    grossSalary = basicSalary + hra + da;

    printf("Gross Salary: %.2f\n", grossSalary);

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter the basic salary: 4500
Gross Salary: 9000.00
```

23. Write a C program 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

ANS:

main.c

```c
#include <stdio.h>

int main() {
    float units, totalBill;
    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the electricity units: ");
    scanf("%f", &units);

    if (units <= 50) {
        totalBill = units * 0.50;
    } else if (units <= 150) {
        totalBill = 50 * 0.50 + (units - 50) * 0.75;
    } else if (units <= 250) {
        totalBill = 50 * 0.50 + 100 * 0.75 + (units - 150) * 1.20;
    } else {
        totalBill = 50 * 0.50 + 100 * 0.75 + 100 * 1.20 + (units - 250) * 1.50;
    }

    totalBill = totalBill + (0.20 * totalBill);

    printf("Total electricity bill: Rs. %.2f\n", totalBill);

    return 0;
}

```

```
SHISHANT CHOUDHARY
Enter the electricity units: 300
Total electricity bill: Rs. 354.00
```

24. Write a C program to convert specified days into years, weeks and days.

ANS:

main.c

```c
#include <stdio.h>

int main() {
    int days, years, weeks, remainingDays;

    printf("SHISHANT CHOUDHARY\n");
    printf("Enter the number of days: ");
    scanf("%d", &days);

    years = days / 365;
    days = days % 365;

    weeks = days / 7;
    days = days % 7;

    remainingDays = days;

    printf("Years: %d\n", years);
    printf("Weeks: %d\n", weeks);
    printf("Days: %d\n", remainingDays);

    return 0;
}
```

```
SHISHANT CHOUDHARY
Enter the number of days: 560
Years: 1
Weeks: 27
Days: 6
```