Lakshmi Narain College of Technology, Bhopal

Department of Electronics and Communication Engineering

Name: ADARSH KUMAR Enrollment No: 0103EC181006

Class: EC V SEM Date: 24 Oct. 2020

Control Flow Statement

Assignment-02

EC – 509

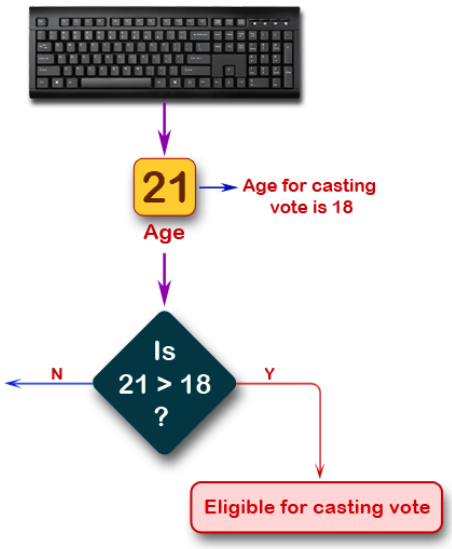
C C++ IT Training

Department: Training and placement Department

Faculty: Ram

---

1. Write a C program to read the age of a candidate and determine whether it is eligible for casting his/her own vote.



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Department of Electronics and Communication Engineering

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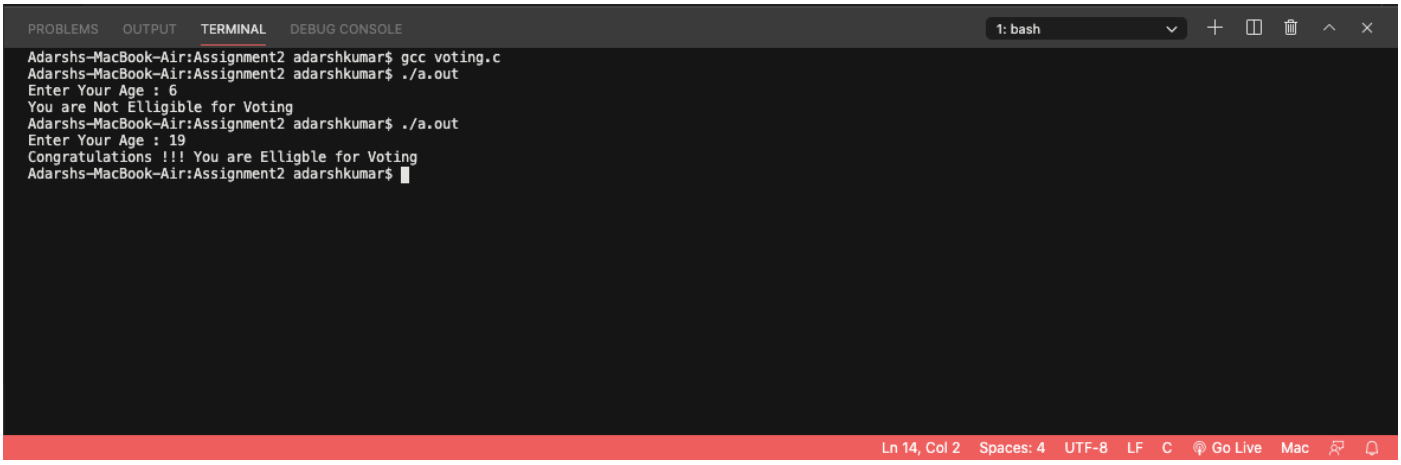
Solution: -

```c
#include<stdio.h>

int main (){
    int a;
    printf("Enter Your Age : ");
    scanf("%d",&a);
    if (a >= 18){
        printf("Congratulations !!! You are Elligble for Voting\n");
    }
    else{
        printf("You are Not Elligible for Voting\n");
    }
    return 0;
}
```

Output:-



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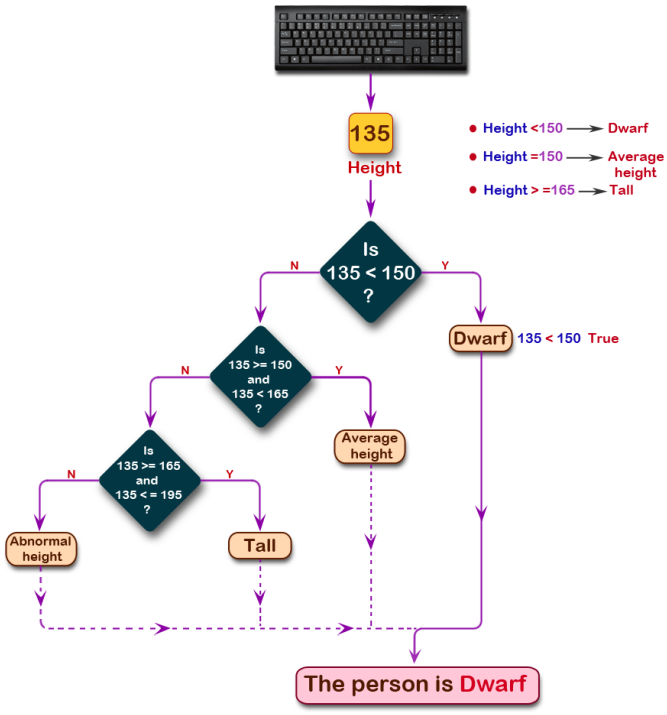
2. Write a C program to accept the height of a person in centimeter and categorize the person according to their height.



Solution: -

```c
#include<stdio.h>

int main (){
    int a;
    printf("Enter the height of the person (in centimeters) : ");
    scanf("%d",&a);
    if (a < 150){
        printf("The person is Dwarf.\n");
    }
    if (a >= 150 && a < 165){
        printf("The person is of Average Height\n");
    }
    if(a >= 165){
        printf("The person is Tall.\n");
    }
    return 0;
}
```

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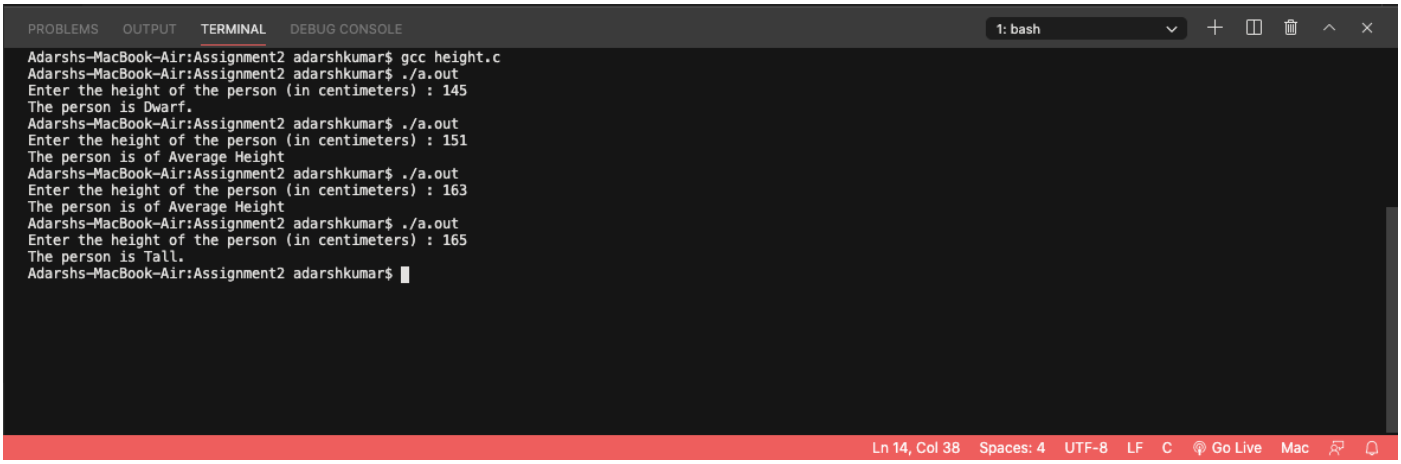
Output:-



3. Write Write a C program to find the eligibility of admission for a professional course based on the following criteria:

   Marks in Math's >=65
   Marks in Phy >=55
   Marks in Chem>=50
   Total in all three subjects >=180
   or
   Total in Math and Physics >=140

Solution: -

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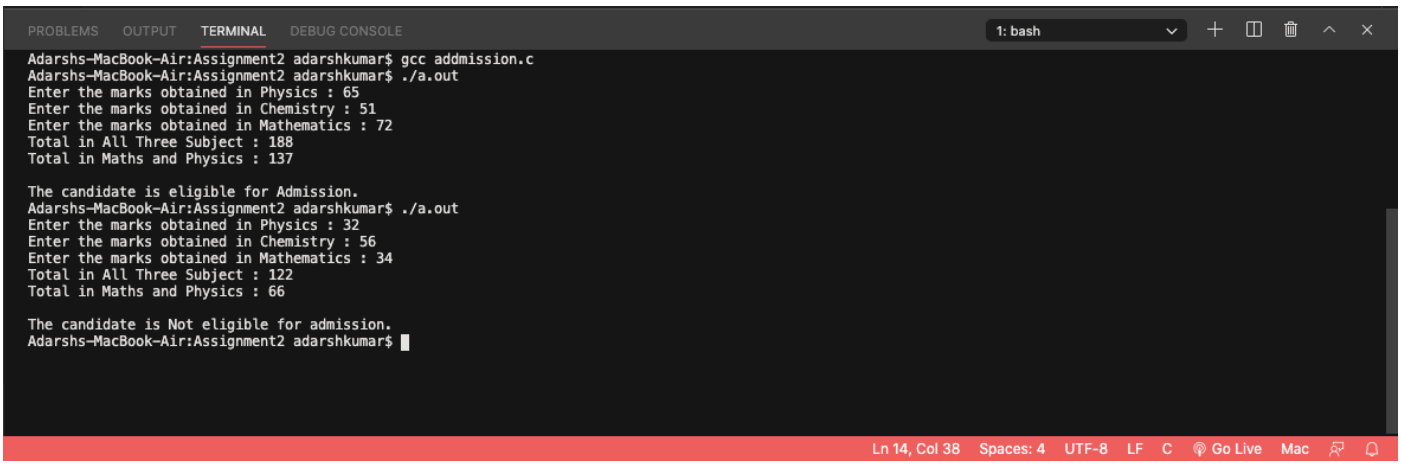
```c
#include<stdio.h>

int main (){
    int p,c,m;

    printf("Enter the marks obtained in Physics : ");
    scanf("%d",&p);
    printf("Enter the marks obtained in Chemistry : ");
    scanf("%d",&c);
    printf("Enter the marks obtained in Mathematics : ");
    scanf("%d",&m);
    printf("Total in All Three Subject : %d\n",p+c+m);
    printf("Total in Maths and Physics : %d\n",m+p);

    if ((m >= 65 && p >= 55 && c >= 50 && p+c+m >= 180) || (m + p >= 140 )){
        printf("\nThe candidate is eligible for Admission.\n");
    }
    else{
        printf("\nThe candidate is Not eligible for admission.\n");
    }

    return 0;
}
```

Output:-



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4. Write Write a C program to read temperature in centigrade and display a suitable message according to temperature state below.

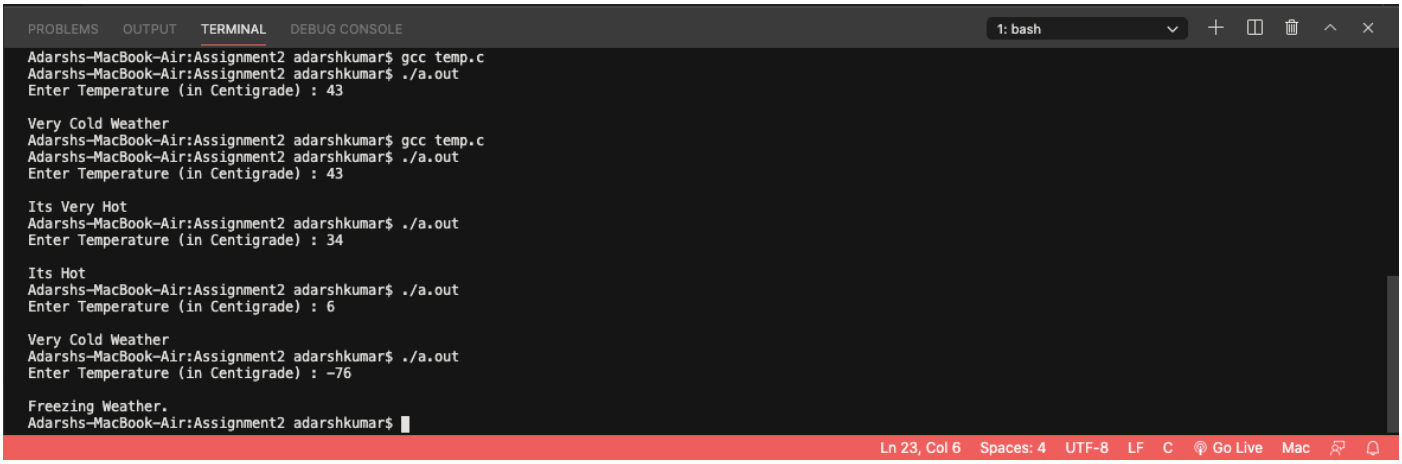
   Temp < 0 then Freezing weather
   Temp 0-10 then Very Cold weather
   Temp 10-20 then Cold weather
   Temp 20-30 then Normal in Temp
   Temp 30-40 then Its Hot
   Temp >=40 then Its Very Hot.

Solution: -

```c
#include<stdio.h>

int main (){
    int t;
    printf("Enter Temperature (in Centigrade) : ");
    scanf("%d",&t);
    if (t < 0)
        printf("\nFreezing Weather.\n");
    else if (t >= 0 && t < 10)
        printf("\nVery Cold Weather\n");
    else if (t >= 10 && t < 20)
        printf("\nCold weather\n");
    else if (t >= 20 && t < 30)
        printf("\nNormal in Temp\n");
    else if (t >= 30 && t < 40)
        printf("\nIts Hot\n");
    else if (t > 40)
        printf("\nIts Very Hot\n");
    return 0;
}
```

Output:-



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5. Write a program in C to calculate and print the Electricity bill of a given customer. The customer id., name and unit consumed by the user should be taken from the keyboard and display the total amount to pay to the customer. The charge are as follow :

Unit	Charge/unit
upto 199	@1.20
200 and above but less than 400	@1.50
400 and above but less than 600	@1.80
600 and above	@2.00

If bill exceeds Rs. 400 then a surcharge of 15% will be charged and the minimum bill should be of Rs. 100/-

```
Input Customer ID :10001
Input the name of the customer :Ram
Input the unit consumed by the customer : 800

Electricity Bill
Customer IDNO                :10001
Customer Name                :Ram
unit Consumed                :800
Amount Charges @Rs. 2.00  per unit : 1600.00
Surcharge Amount             :  240.00
Net Amount Paid By the Customer     : 1840.00
```

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Solution: -

```c
#include<stdio.h>

int main(){
    int id, unit;
    char name[20];
    float rate = 0.0;

    printf("Enter Customer ID : ");
    scanf("%d",&id);
    printf("\nEnter the name of the customer : ");
    scanf("%s",name);
    fflush(stdin);
    printf("\nEnter the unit consumed by the customer : ");
    scanf("%d",&unit);

    if (unit <= 199)
        rate = 1.20;
    else if (unit >= 200 && unit < 400)
        rate = 1.50;
    else if(unit >= 400 && unit < 600)
        rate = 1.80;
    else if (unit >= 600)
        rate = 2.00;

    printf("\nElectricity Bill\n");
    printf("\nCustomer IDNO\t\t\t: %d\n",id);
    printf("\nCustomer Name\t\t\t: %s\n",name);
    printf("\nUnit Consumed\t\t\t: %d\n",unit);
    printf("\nAmount Charges @Rs. %.2f  per unit : %.2f\n",rate,unit * rate);
    if ((unit * rate) >= 400){
        printf("Surcharge Amount\t\t\t: %.2f\n",(unit * rate) * (0.15));
    }
    if ((unit * rate) < 100){
        printf("\nNet Amount Paid By the Customer\t: 100\n");
    }
    else{
        printf("\nNet Amount Paid By the Customer\t: %.2f\n\n", (unit * rate) + ((unit * rate) *
(0.15)));
    }
    return 0;
}
```

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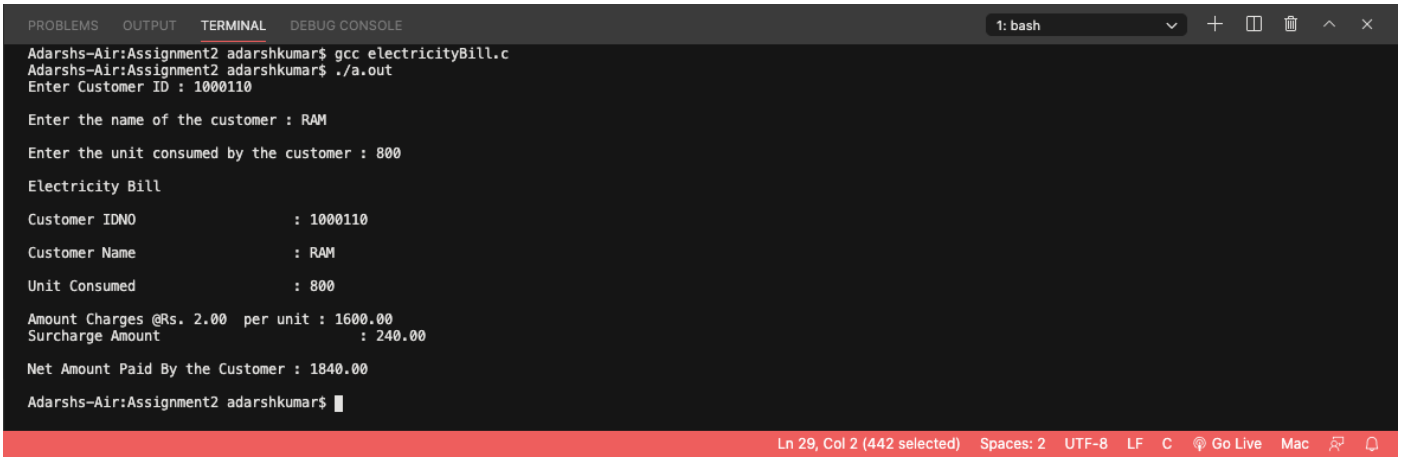
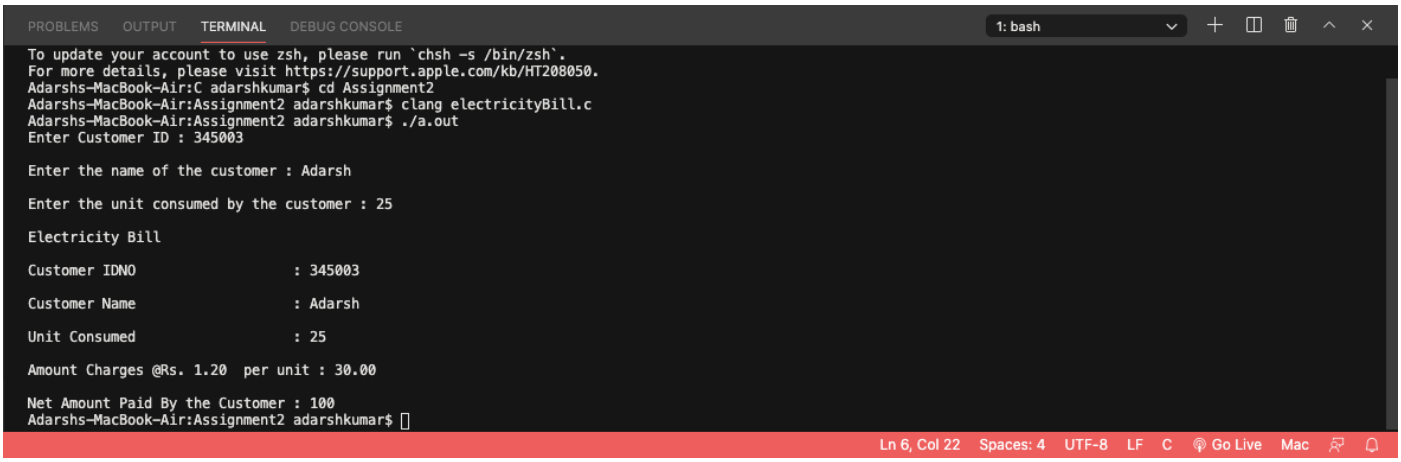
Output:-





6. Write a program in C which is a Menu-Driven Program to compute the area of the various geometrical shape.

Sample Output:

> Input 1 for area of circle
>
> Input 2 for area of rectangle
>
> Input 3 for area of triangle
>
> Input your choice : 1
>
> Input radius of the circle : 5
>
> The area is : 78.500000

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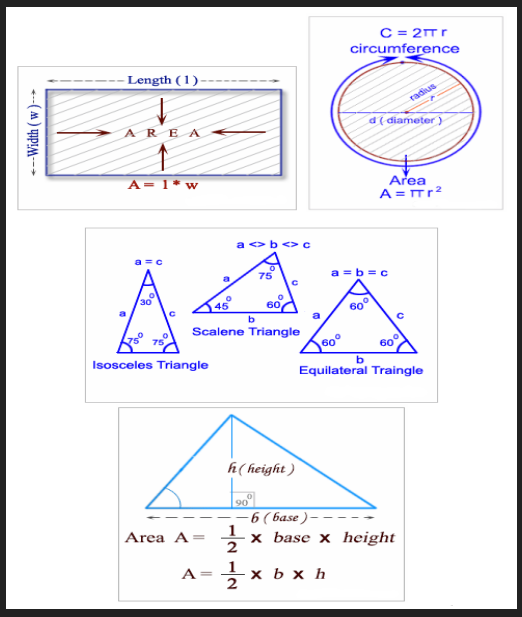
Solution: -

```c
#include<stdio.h>

int main (){
    short ch;
    int a,b;
    printf("Input 1 for area of Circle");
    printf("\nInput 2 for area of rectangle");
    printf("\nInput 3 for area of triangle");
    printf("\nEnter Your Choice : ");
    scanf("%hi",&ch);
    switch (ch)
    {
    case 1:
        printf("Enter Radius of the Circle : ");
        scanf("%d",&a);
        printf("\nThe Area is : %.2f\n",(3.14 * a * a));
        break;
    case 2:
        printf("Enter Length of Rectangle : ");
        scanf("%d",&a);
        printf("Enter Breadth of Rectangle : ");
        scanf("%d",&b);
        printf("\nThe Area is : %d\n",a * a);
        break;
    case 3:
        printf("Enter Base of Triangle : ");
        scanf("%d",&a);
        printf("Enter Height of Triangle : ");
        scanf("%d",&b);
        printf("\nThe Area is : %.2f\n",(0.5 * a * b));
        break;
    default:
        printf("\nInvalid Input , Try Again !!!\n");
        break;
    }
    return 0;
}
```



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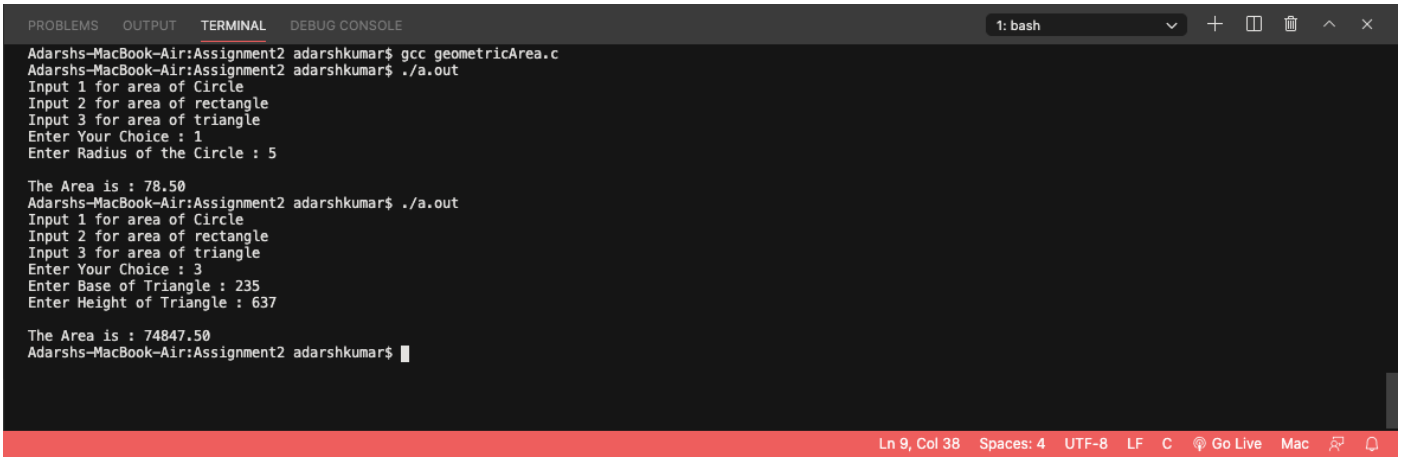
Output:-

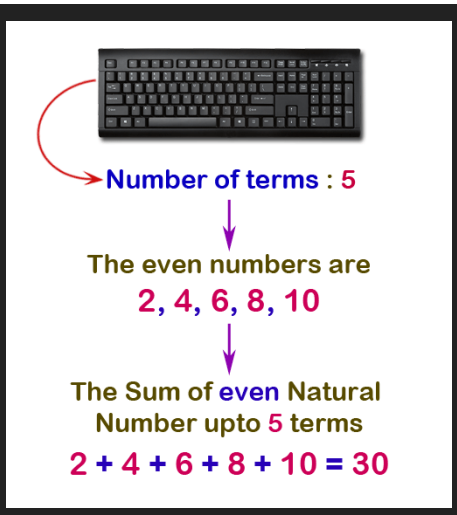


7. Write a C program that read 5 numbers and counts the number of positive numbers and print the average of all positive values.

Solution: -

```c
#include<stdio.h>

int main (){
    int n;
    short i,count = 1, sum = 0;
    printf("Enter number of terms : ");
    scanf("%d",&n);
    printf("\nThe Even Numbers are : ");
    for (i = 1; count <= n;i++)
    {
        if (i % 2 == 0){
            printf("%d ",i);
            sum += i;
            count++;
        }
    }
    printf("\nSum of Even Natural Numbers upto %d terms = %d\n",count - 1,sum);
    return 0;
}
```



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Output:-

```
PROBLEMS  OUTPUT  TERMINAL  DEBUG CONSOLE                    1: bash

Adarshs-MacBook-Air:Assignment2 adarshkumar$ gcc evenNatural.c
Adarshs-MacBook-Air:Assignment2 adarshkumar$ ./a.out
Enter number of terms : 5

The Even Numbers are : 2 4 6 8 10
Sum of Even Natural Numbers upto 5 terms = 30
Adarshs-MacBook-Air:Assignment2 adarshkumar$ ./a.out
Enter number of terms : 6

The Even Numbers are : 2 4 6 8 10 12
Sum of Even Natural Numbers upto 6 terms = 42
Adarshs-MacBook-Air:Assignment2 adarshkumar$ ./a.out
Enter number of terms : 7

The Even Numbers are : 2 4 6 8 10 12 14
Sum of Even Natural Numbers upto 7 terms = 56
Adarshs-MacBook-Air:Assignment2 adarshkumar$
```

Ln 13, Col 22 Spaces: 4 UTF-8 LF C Go Live Mac

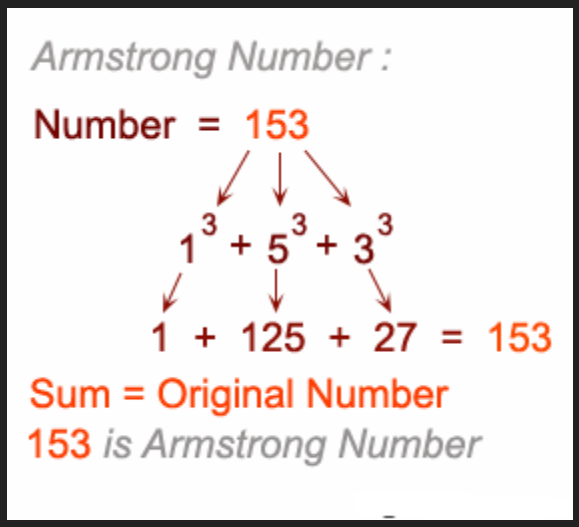
8. Write a C program to check whether a given number is an Armstrong number or not.

Solution: -

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

int main () {
    int n,sum = 0,real,rem,p = 0;
    printf("Enter a Number : ");
    scanf("%d",&n);

    real = n;
    while (n != 0){
        ++p;
        n = n / 10;
    }
    n = real;
    do{
        rem = n % 10;
        sum += pow(rem , p);
        n = n / 10;
    } while (n != 0);
    if (sum == real){
        printf("\n%d is an Armstrong number.\n",real);
    }
    else{
        printf("\n%d is Not an Armstrong number.\n",real);
    }
    return 0;
}
```



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Output:-

```
PROBLEMS  OUTPUT  TERMINAL  DEBUG CONSOLE                    1: bash

Adarshs-MacBook-Air:Assignment2 adarshkumar$ gcc Armstrong.c
Adarshs-MacBook-Air:Assignment2 adarshkumar$ ./a.out
Enter a Number : 153

153 is an Armstrong number.
Adarshs-MacBook-Air:Assignment2 adarshkumar$ ./a.out
Enter a Number : 370

370 is an Armstrong number.
Adarshs-MacBook-Air:Assignment2 adarshkumar$ ./a.out
Enter a Number : 371

371 is an Armstrong number.
Adarshs-MacBook-Air:Assignment2 adarshkumar$ ./a.out
Enter a Number : 4513

4513 is Not an Armstrong number.
Adarshs-MacBook-Air:Assignment2 adarshkumar$ ./a.out
Enter a Number : 155

155 is Not an Armstrong number.
Adarshs-MacBook-Air:Assignment2 adarshkumar$
Adarshs-MacBook-Air:Assignment2 adarshkumar$

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```
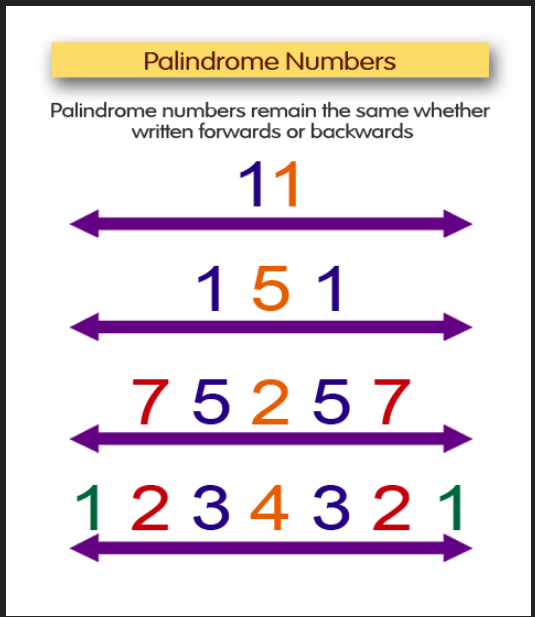

9. Write a program in C to check whether a number is a palindrome or not.

Solution: -

```c
#include<stdio.h>
int main(){
    int n,rev = 0, r, num;
    printf("Enter a Number : ");
    scanf("%d",&n);
    num = n;
    while (n != 0)
    {
        r = n % 10;
        rev = rev * 10 + r;
        n =  n / 10;

    }
    if (num == rev){
        printf("%d is a Palindrome Number\n",num);
    }
    else{
        printf("%d is Not a Palindrome Number. \n",num);
    }
    return 0;
}
```



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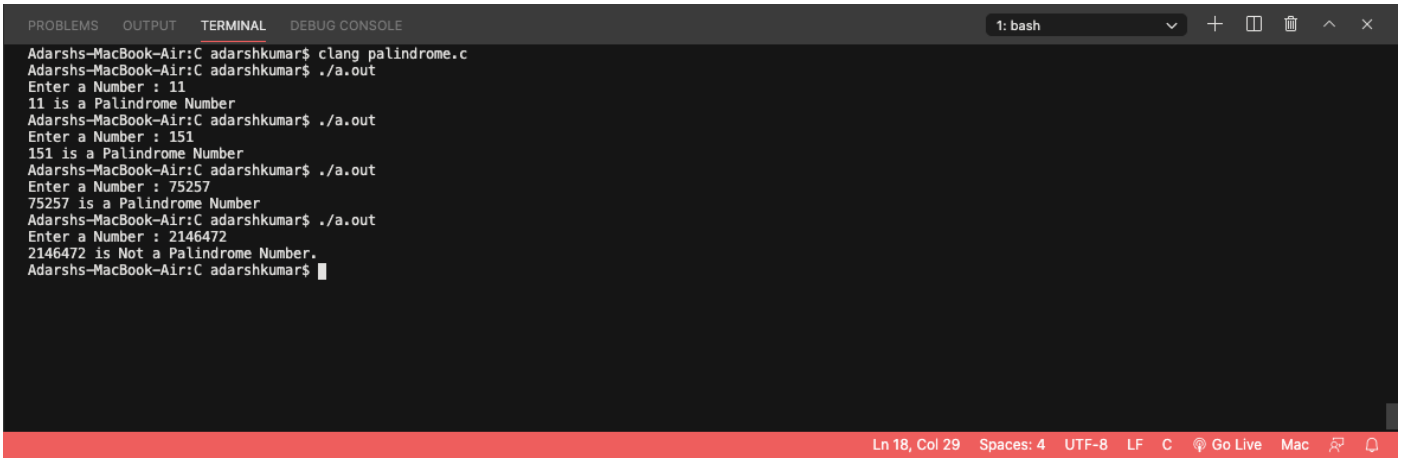
Output:-



10. Write a program in C to convert a decimal number into binary without using an array.

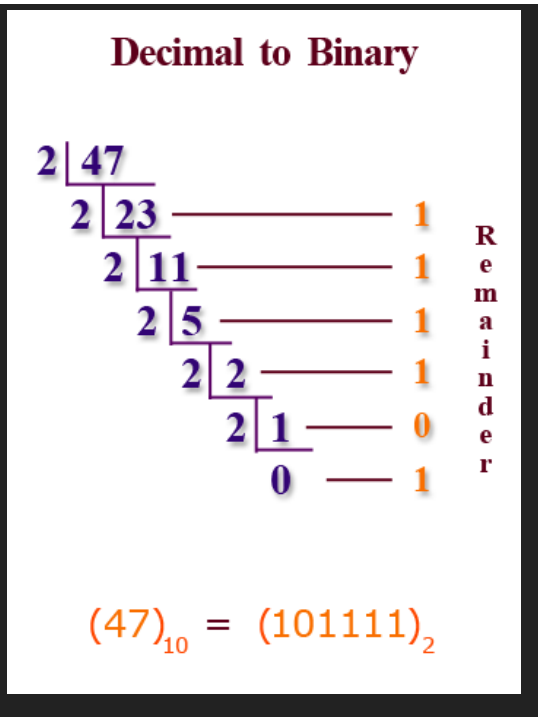
Solution: -

```c
#include<stdio.h>

int main (){
    int n,num[10],i;
    printf("Enter a number to convert : ");
    scanf("%d",&n);
    printf("\nThe Binary of %d is ",n);

    for (i = 0; n > 0; i++){
        num[i] = n % 2;
        n = n / 2;
    }

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



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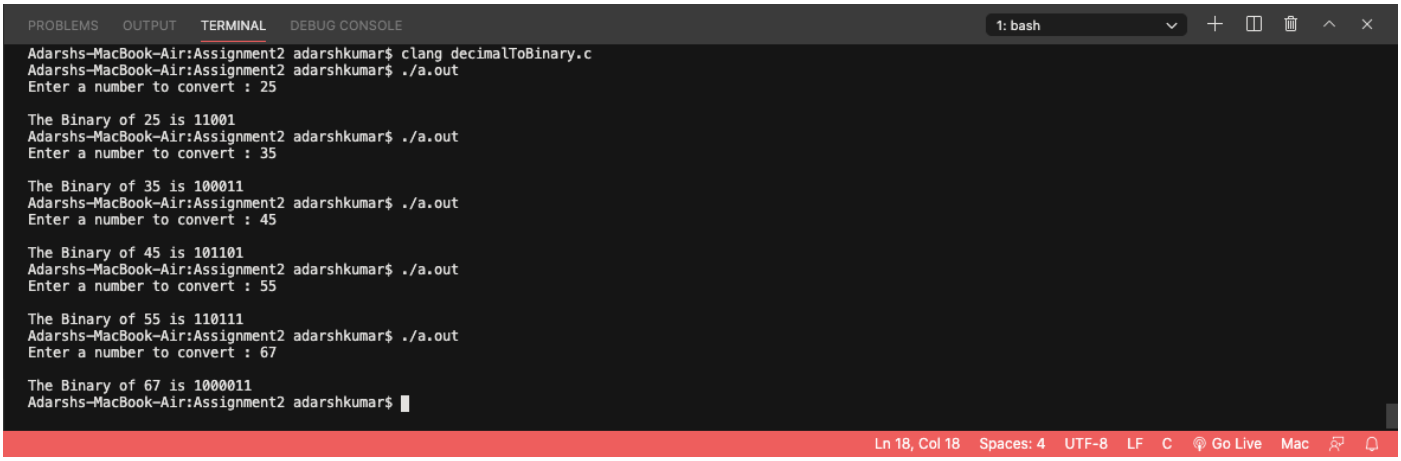
Output:-

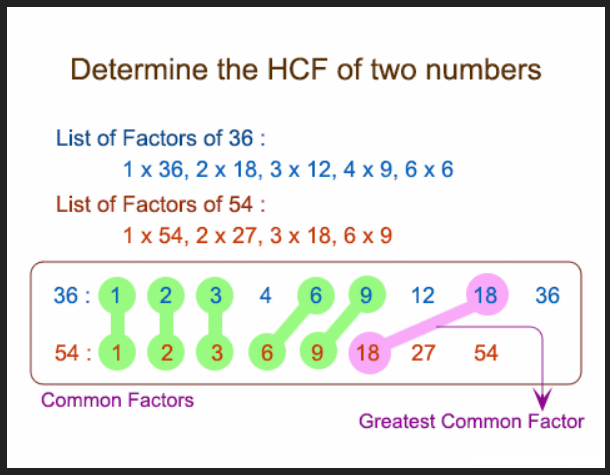


11. Write a C program to find HCF (Highest Common Factor) of two numbers.

Solution: -

```c
#include<stdio.h>

int main (){
    int x,y,hcf = 1,i;
    printf("Input 1st number for HCF: ");
    scanf("%d",&x);
    printf("Input 2nd number for HCF: ");
    scanf("%d",&y);
    for (i = 1; i <= x || i <= y ; i++){
        if (x % i == 0 && y % i == 0){
            hcf = i;
        }
    }
    printf("\nHCF of %d and %d is %d\n",x,y,hcf);
    return 0;
}
```



Output:-

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```
PROBLEMS  OUTPUT  TERMINAL  DEBUG CONSOLE                    1: bash
Adarshs-MacBook-Air:Assignment2 adarshkumar$ clang hcf.c
Adarshs-MacBook-Air:Assignment2 adarshkumar$ ./a.out
Input 1st number for HCF: 24
Input 2nd number for HCF: 28

HCF of 24 and 28 is 4
Adarshs-MacBook-Air:Assignment2 adarshkumar$ ./a.out
Input 1st number for HCF: 35
Input 2nd number for HCF: 135

HCF of 35 and 135 is 5
Adarshs-MacBook-Air:Assignment2 adarshkumar$ ./a.out
Input 1st number for HCF: 56
Input 2nd number for HCF: 78

HCF of 56 and 78 is 2
Adarshs-MacBook-Air:Assignment2 adarshkumar$
Ln 14, Col 39  Spaces: 4  UTF-8  LF  C  Go Live  Mac
```

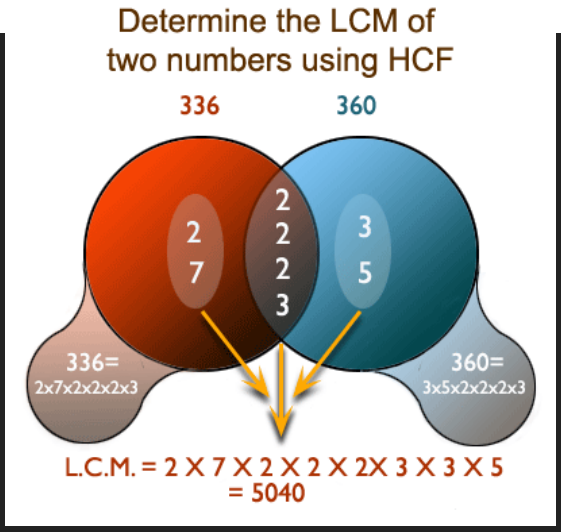
12. Write a program in C to find LCM of any two numbers using HCF.

Solution: -

```c
#include<stdio.h>

int main (){
    int x,y,lcm = 1,i,max;
    printf("Input 1st number for LCM : ");
    scanf("%d",&x);
    printf("Input 2nd number for LCM : ");
    scanf("%d",&y);

    if (x > y)
        max = x;
    else
        max = y;
    while (1){
        if (max % x == 0 && max % y == 0){
        printf("\nThe LCM of %d and %d is : %d\n",x,y,max);
        break;
        }
    else{
        max++;
        }
    }
    return 0;
}
```



Output:-

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```
PROBLEMS  OUTPUT  TERMINAL  DEBUG CONSOLE                    1: bash
Adarshs-MacBook-Air:Assignment2 adarshkumar$ clang lcm.c
Adarshs-MacBook-Air:Assignment2 adarshkumar$ ./a.out
Input 1st number for LCM : 15
Input 2nd number for LCM : 20

The LCM of 15 and 20 is : 60
Adarshs-MacBook-Air:Assignment2 adarshkumar$ ./a.out
Input 1st number for LCM : 3463
Input 2nd number for LCM : 2563

The LCM of 3463 and 2563 is : 8875669
Adarshs-MacBook-Air:Assignment2 adarshkumar$
```

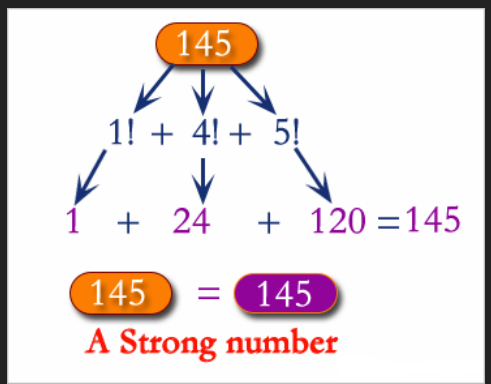
Ln 15, Col 36 Spaces: 4 UTF-8 LF C Go Live Mac

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

Solution: -

```c
#include<stdio.h>

int main (){
    int n,rem,sum = 0,fact = 1,real;
    printf("Check whether a number is Strong Number or not : \n");
    printf(" ---------------------------------------------------- \n");
    printf("\nInput a number to check whether it is Strong number : ");
    scanf("%d",&n);
    real = n;
    while (n > 0)
    {
        rem = n % 10;
        for (; rem > 0 ; rem --){
        fact *= rem;
        }
        sum += fact;
        fact = 1;
        n = n / 10;
    }
    if (sum == real)
        printf("\n%d is a Strong number.\n",real);
    else
        printf("\n%d is Not a Strong number.\n",real);
    return 0;
}
```



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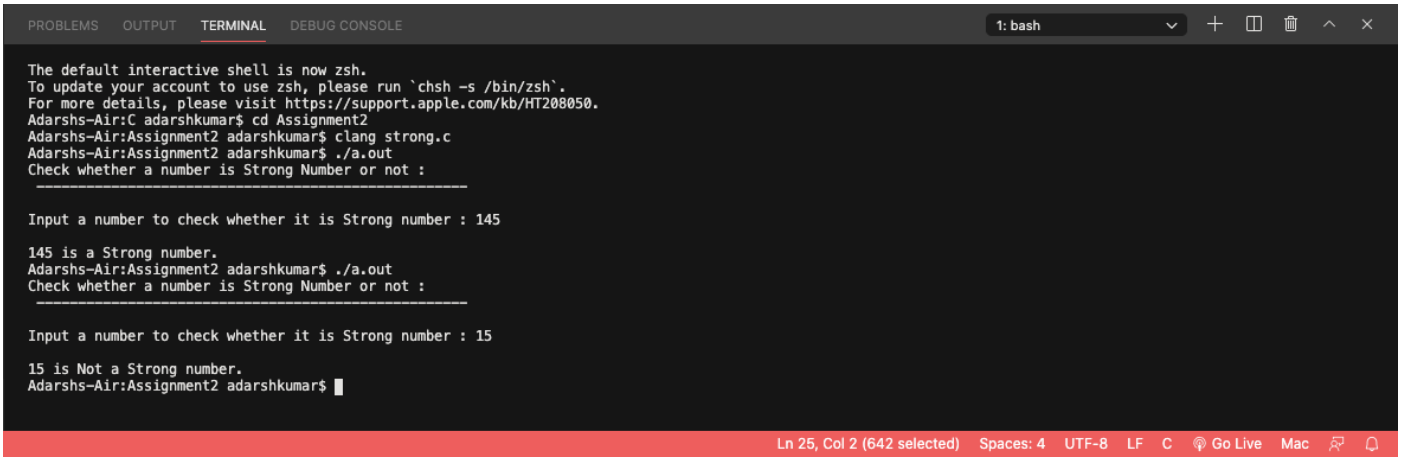
Output:-



14. Write a program in C to Check Whether a Number can be Express as Sum of Two Prime Numbers.

Solution: -

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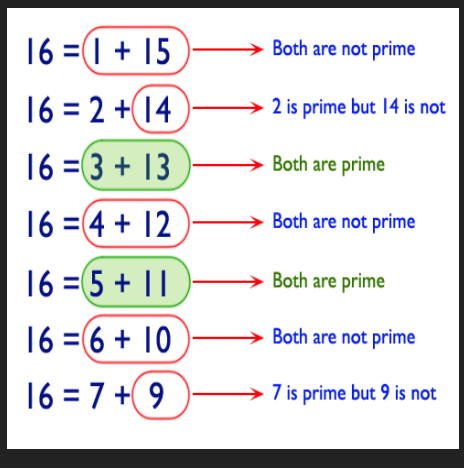
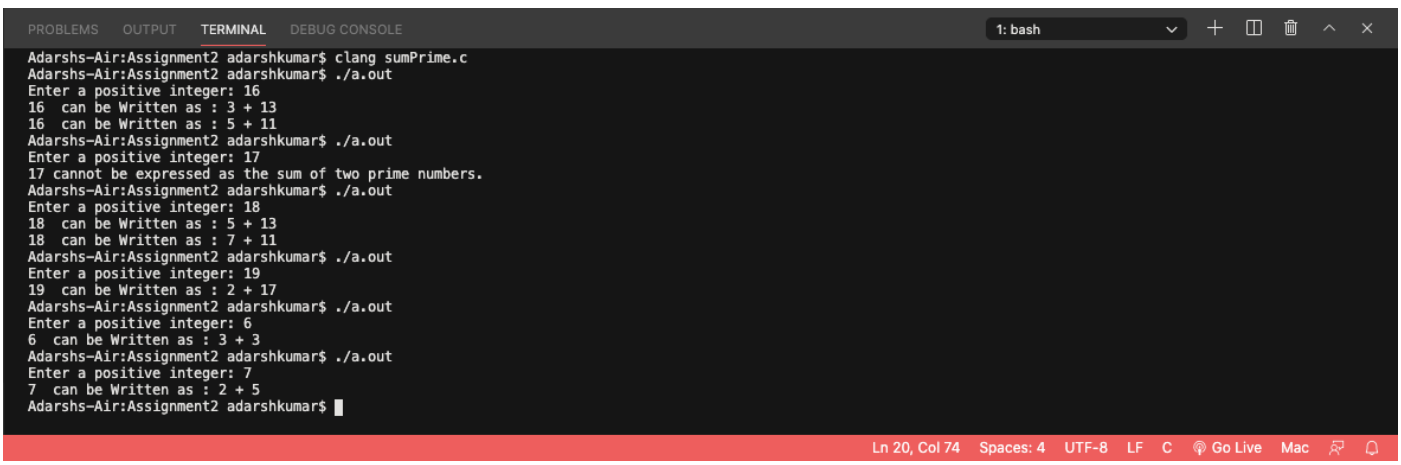
```c
#include <stdio.h>
int checkPrime(int n);
int main() {
    int n, i, flag = 0;
    printf("Enter a positive integer: ");
    scanf("%d", &n);

    for (i = 2; i <= n / 2; ++i) {
        // condition for i to be a prime number
        if (checkPrime(i) == 1) {
            // condition for n-i to be a prime number
            if (checkPrime(n - i) == 1) {
                printf("%d  can be Written as : %d + %d\n", n, i, n - i);
                flag = 1;
            }
        }
    }
    if (flag == 0)
        printf("%d cannot be expressed as the sum of two prime numbers.\n", n);
    return 0;
}
// function to check prime number
int checkPrime(int n) {
    int i, isPrime = 1;
    for (i = 2; i <= n / 2; ++i) {
        if (n % i == 0) {
            isPrime = 0;
            break;
        }
    }
    return isPrime;
}
```



Output:-



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15. Write a c program to print following pattern.

Solution: -

```c
#include<stdio.h>

int main (){
    int n,i,j,space;
    printf("Enter Nuumber of Rows : ");
    scanf("%d",&n);

    for(i = n; i >= 0; i--){
        for(j = 0; j <=i; j++){
            printf("* ");
        }
        space = (2 * n) - (2 * i);
        for(j = 1; j <= space; j++){
            printf("  ");
        }
        for(j = 0; j <= i; j++){
            printf("* ");
        }
        printf("\n");
    }

    return 0;
}
```

```
* * * * * * * * * * 
* * * *     * * * * 
* * *         * * * 
* *             * * 
*                 *
```

Output:-

```
PROBLEMS  OUTPUT  TERMINAL  DEBUG CONSOLE                    1: bash

Adarshs-Air:Assignment2 adarshkumar$ clang halfButterfly.c
Adarshs-Air:Assignment2 adarshkumar$ ./a.out
Enter Nuumber of Rows : 5
* * * * * * * * * * 
* * * *     * * * * 
* * *         * * * 
* *             * * 
*                 *
Adarshs-Air:Assignment2 adarshkumar$ ./a.out
Enter Nuumber of Rows : 6
* * * * * * * * * * * * 
* * * * *     * * * * * 
* * * *         * * * * 
* * *             * * * 
* *                 * * 
*                     *
Adarshs-Air:Assignment2 adarshkumar$
```

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16. Write a c program to print following pattern.

Solution: -

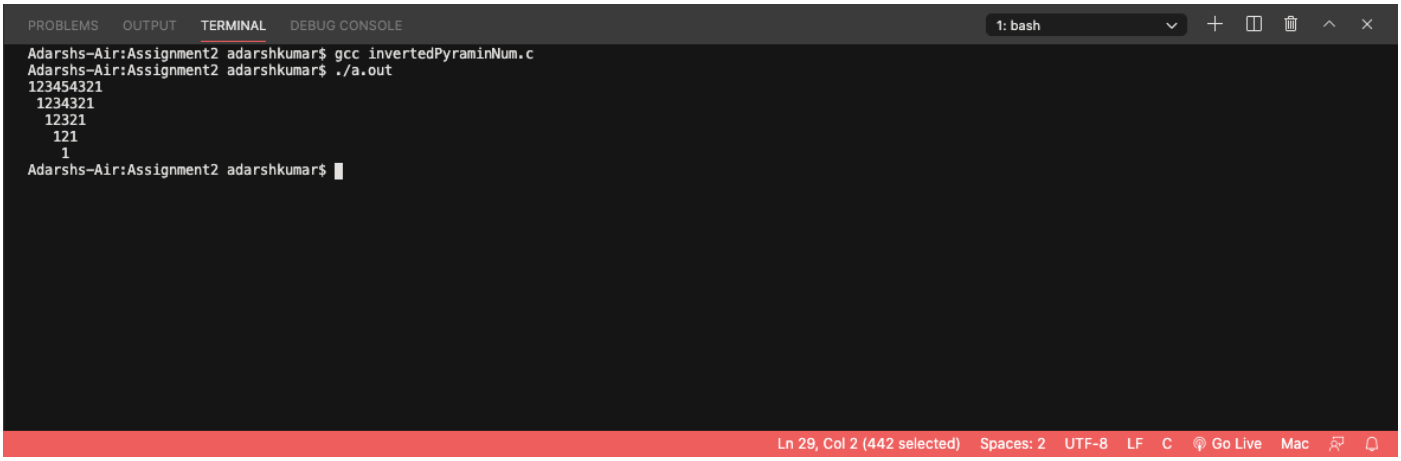
```c
#include<stdio.h>
int main (){

    int r,c;
    for (r = 5; r >= 1; r--){
        for (c = 5; c > r; c--){
          printf(" ");
        }
        for (c = 1; c <= r ; c++){
            printf("%d", c);
        }
        for(c=r-1; c>=1; c--){
            printf("%d", c);
        }

        for (c = 5; c > r; c--){
          printf(" ");
        }
        printf("\n");
    }
    return 0;
}
```

```
123454321
1234321
12321
121
1
```

Output:-



Student Sign: _____ Teacher's Sign: _____