

DELHI TECHNOLOGICAL UNIVERSITY

(Formerly Delhi College of Engineering)

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



Lab Code: PROGRAMMING FUNDAMENTALS

Lab File

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EXPERIMENT 1

AIM: Write a C program to find sum and average of two numbers.

CODE:

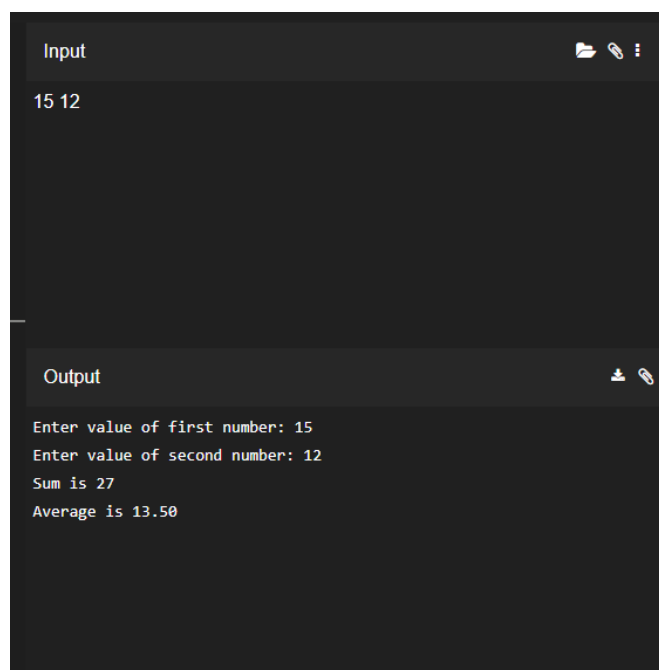
```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    int x,y,sum;
    printf("Enter value of first number:");
    scanf("%d",&x);
    printf(" %d\n",x); //this printf used only when using online IDE

    printf("Enter value of second number:");
    scanf("%d",&y);
    printf(" %d\n",y); //this printf used only when using online IDE

    sum=x+y;
    float average= (float)sum/2;
    printf("Sum is %d \nAverage is %.2f",sum,average);
    return 0;
}
```

OUTPUT:



The screenshot shows a terminal window with two sections: 'Input' and 'Output'. In the 'Input' section, the user has entered '15' and '12' on separate lines. In the 'Output' section, the program has printed the prompts 'Enter value of first number: 15' and 'Enter value of second number: 12', followed by the results 'Sum is 27' and 'Average is 13.50'.

```
Input
15
12

Output
Enter value of first number: 15
Enter value of second number: 12
Sum is 27
Average is 13.50
```

EXPERIMENT 2

AIM: Write a C program to find the greatest of 10 numbers.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    int n1,n2,n3,n4,n5,n6,n7,n8,n9,n10;
    printf("Enter value of 1st no.: ");
    scanf("%d",&n1);
    printf("Enter value of 2nd no.: ");
    scanf("%d",&n2);
    printf("Enter value of 3rd no.: ");
    scanf("%d",&n3);
    printf("Enter value of 4th no.: ");
    scanf("%d",&n4);
    printf("Enter value of 5th no.: ");
    scanf("%d",&n5);
    printf("Enter value of 6th no.: ");
    scanf("%d",&n6);
    printf("Enter value of 7th no.: ");
    scanf("%d",&n7);
    printf("Enter value of 8th no.: ");
    scanf("%d",&n8);
    printf("Enter value of 9th no.: ");
    scanf("%d",&n9);
    printf("Enter value of 10th no.: ");
    scanf("%d",&n10);
    printf("\n");

    if(n1>=n2 && n1>=n3 && n1>=n4 && n1>=n5 && n1>=n6 && n1>=n7 && n1>=n8 && n1>=n9 && n1>=n10)
        printf("Highest of the numbers is %d",n1);
    else if(n2>=n1 && n2>=n3 && n2>=n4 && n2>=n5 && n2>=n6 && n2>=n7 && n2>=n8 && n2>=n9 && n2>=n10)
        printf("Highest of the numbers is %d",n2);
    else if(n3>=n1 && n3>=n2 && n3>=n4 && n3>=n5 && n3>=n6 && n3>=n7 && n3>=n8 && n3>=n9 && n3>=n10)
        printf("Highest of the numbers is %d",n3);
    else if(n4>=n1 && n4>=n2 && n4>=n3 && n4>=n5 && n4>=n6 && n4>=n7 && n4>=n8 && n4>=n9 && n4>=n10)
        printf("Highest of the numbers is %d",n4);
    else if(n5>=n1 && n5>=n2 && n5>=n3 && n5>=n4 && n5>=n6 && n5>=n7 && n5>=n8 && n5>=n9 && n5>=n10)
        printf("Highest of the numbers is %d",n5);
    else if(n6>=n1 && n6>=n2 && n6>=n3 && n6>=n4 && n6>=n5 && n6>=n7 && n6>=n8 && n6>=n9 && n6>=n10)
        printf("Highest of the numbers is %d",n6);
    else if(n7>=n1 && n7>=n2 && n7>=n3 && n7>=n4 && n7>=n5 && n7>=n6 && n7>=n8 && n7>=n9 && n7>=n10)
        printf("Highest of the numbers is %d",n7);
    else if(n8>=n1 && n8>=n2 && n8>=n3 && n8>=n4 && n8>=n5 && n8>=n6 && n8>=n7 && n8>=n9 && n8>=n10)
        printf("Highest of the numbers is %d",n8);
    else if(n9>=n1 && n9>=n2 && n9>=n3 && n9>=n4 && n9>=n5 && n9>=n6 && n9>=n7 && n9>=n8 && n9>=n10)
        printf("Highest of the numbers is %d",n9);
    else if(n10>=n1 && n10>=n2 && n10>=n3 && n10>=n4 && n10>=n5 && n10>=n6 && n10>=n7 && n10>=n8 && n10>=n9 && n10>=n10)
        printf("Highest of the numbers is %d",n10);
    else
        printf("All numbers are equal");
}
```

```

printf("Highest of the numbers is %d",n6);
else if(n7>=n1 && n7>=n2 && n7>=n3 && n7>=n4 && n7>=n5 && n7>=n6 && n7>=n8 && n7>=n9 &
& n7>=n10)
printf("Highest of the numbers is %d",n7);
else if(n8>=n1 && n8>=n2 && n8>=n3 && n8>=n4 && n8>=n5 && n8>=n6 && n8>=n7 && n8>=n9 &
& n8>=n10)
printf("Highest of the numbers is %d",n8);
else if(n9>=n1 && n9>=n2 && n9>=n3 && n9>=n4 && n9>=n5 && n9>=n6 && n9>=n7 && n9>=n8 &
& n9>=n10)
printf("Highest of the numbers is %d",n9);
else if(n10>=n1 && n10>=n2 && n10>=n3 && n10>=n4 && n10>=n5 && n10>=n6 && n10>=n7 && n
10>=n8 && n10>=n9)
printf("Highest of the numbers is %d",n10);
printf("\n\n\n");
return 0;
}

```

OUTPUT:

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Windows PowerShell

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Try the new cross-platform PowerShell <https://aka.ms/powershell>

```

PS G:\Codes> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc greatest_of_10.c -o greatest_of_10 } ; if ($?) { .\greatest_of_10 }
Enter value of 1st no.: 5
Enter value of 2nd no.: 12
Enter value of 3rd no.: 45
Enter value of 4th no.: 7
Enter value of 5th no.: 15
Enter value of 6th no.: 26
Enter value of 7th no.: 42
Enter value of 8th no.: 35
Enter value of 9th no.: 38
Enter value of 10th no.: 28

```

Highest of the numbers is 45

```

PS G:\Codes\CO 102 Programs> 

```

EXPERIMENT 3

AIM: Write a C program to find Simple Interest.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    float p,t,r;
    printf("Enter the value of principle amount: ");
    scanf("%f",&p);
    printf("Enter the value of rate of interest: ");
    scanf("%f",&r);
    printf("Enter the number of years: ");
    scanf("%f",&t);

    float simple_interest = p*t*r/100.0;
    printf("Value of simple interest is %.2f\n\n\n",simple_interest);
    return 0;
}
```

OUTPUT:

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
PS G:\Codes> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc Simple_interest.c -o Simple_interest } ; if ($?) { .\Simple_interest }
Enter the value of principle amount: 200
Enter the value of rate of interest: 25
Enter the number of years: 2
Value of simple interest is 100.00
```

```
PS G:\Codes\C0 102 Programs> █
```

EXPERIMENT 4

AIM: Write a C program to print the following pattern (triangle of stars)

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include <stdio.h>
int main()
{
    int rows,space;
    printf("Odd no. of Rows: ");
    scanf("%d",&rows);
    for(int i=1;i<=rows;i=i+2)
    {
        space=(rows-i)/2;
        for(int r=1;r<=rows;++r)
        {
            if(r<=space || r>(rows-space))
                printf(" ");
            else
                printf("*");
        }
        printf("\n");
    }
    return 0;
}
```

OUTPUT:

[illegible]

EXPERIMENT 5

AIM: Write a C program to find whether the entered number is prime.

CODE:

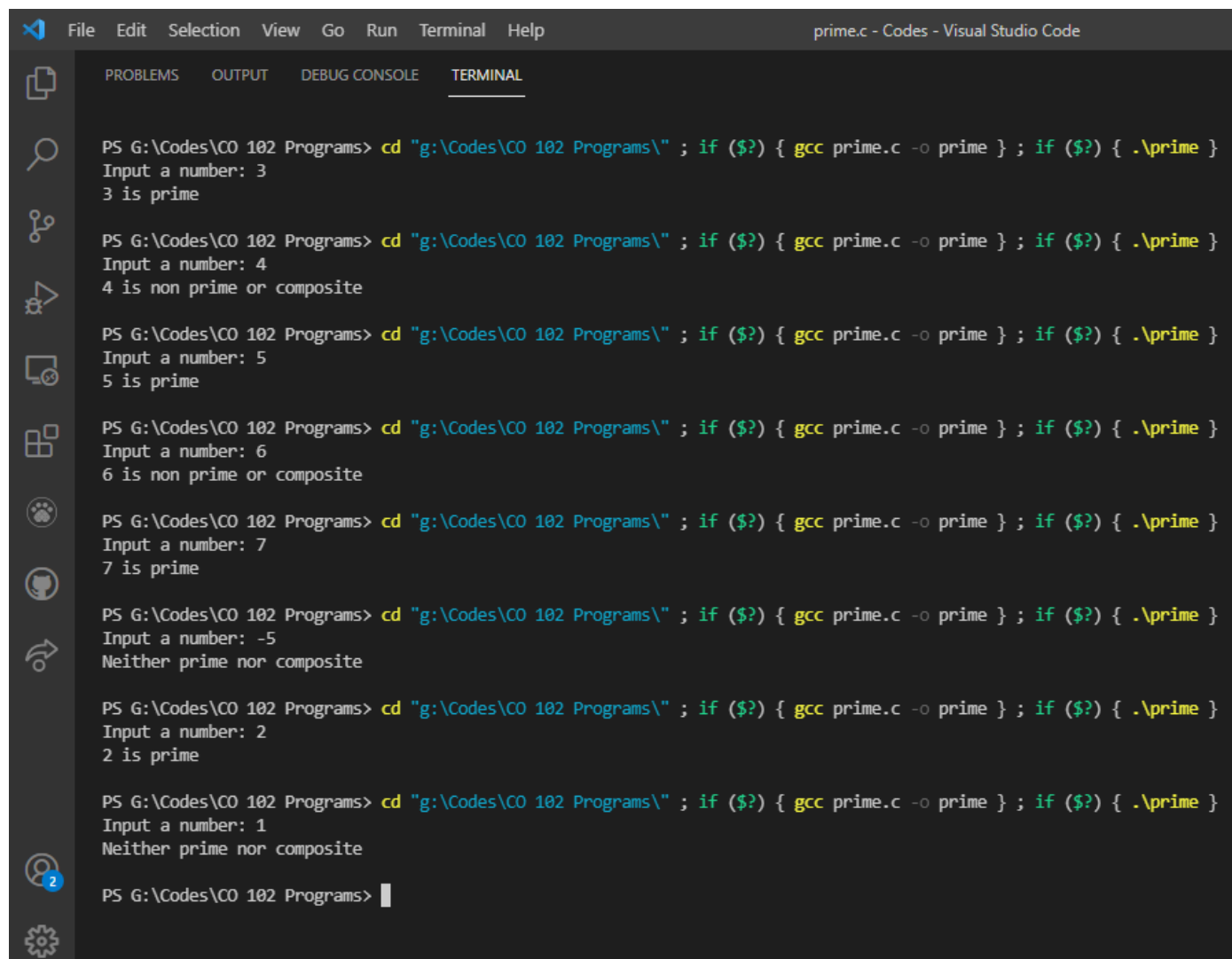
```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
#include<math.h>
int main()
{
    int n,count=0;
    printf("Input a number: ");
    scanf("%d",&n);
    if(n<=1)
    {
        printf("Neither prime nor composite\n\n");
        count=1;
    }

    for(int i=2;i<=sqrt(n) && count==0;++i)
    {
        if(n%i==0)
        {
            printf("%d is non prime or composite\n\n",n);
            count=1;
        }
    }

    if(count==0)
    {
        printf("%d is prime\n\n",n);
    }
    return 0;
}
```

OUTPUT:



The screenshot shows the Visual Studio Code interface with the 'TERMINAL' tab active. The terminal window displays the execution of a C program named 'prime.c' which checks if a number is prime, composite, or neither. The program is run from the directory 'G:\Codes\C0 102 Programs'. The user enters numbers 3, 4, 5, 6, 7, -5, 2, and 1, and the program outputs the corresponding result for each.

```
prime.c - Codes - Visual Studio Code

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc prime.c -o prime } ; if ($?) { .\prime }
Input a number: 3
3 is prime

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc prime.c -o prime } ; if ($?) { .\prime }
Input a number: 4
4 is non prime or composite

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc prime.c -o prime } ; if ($?) { .\prime }
Input a number: 5
5 is prime

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc prime.c -o prime } ; if ($?) { .\prime }
Input a number: 6
6 is non prime or composite

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc prime.c -o prime } ; if ($?) { .\prime }
Input a number: 7
7 is prime

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc prime.c -o prime } ; if ($?) { .\prime }
Input a number: -5
Neither prime nor composite

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc prime.c -o prime } ; if ($?) { .\prime }
Input a number: 2
2 is prime

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc prime.c -o prime } ; if ($?) { .\prime }
Input a number: 1
Neither prime nor composite

PS G:\Codes\C0 102 Programs> 
```

EXPERIMENT 6

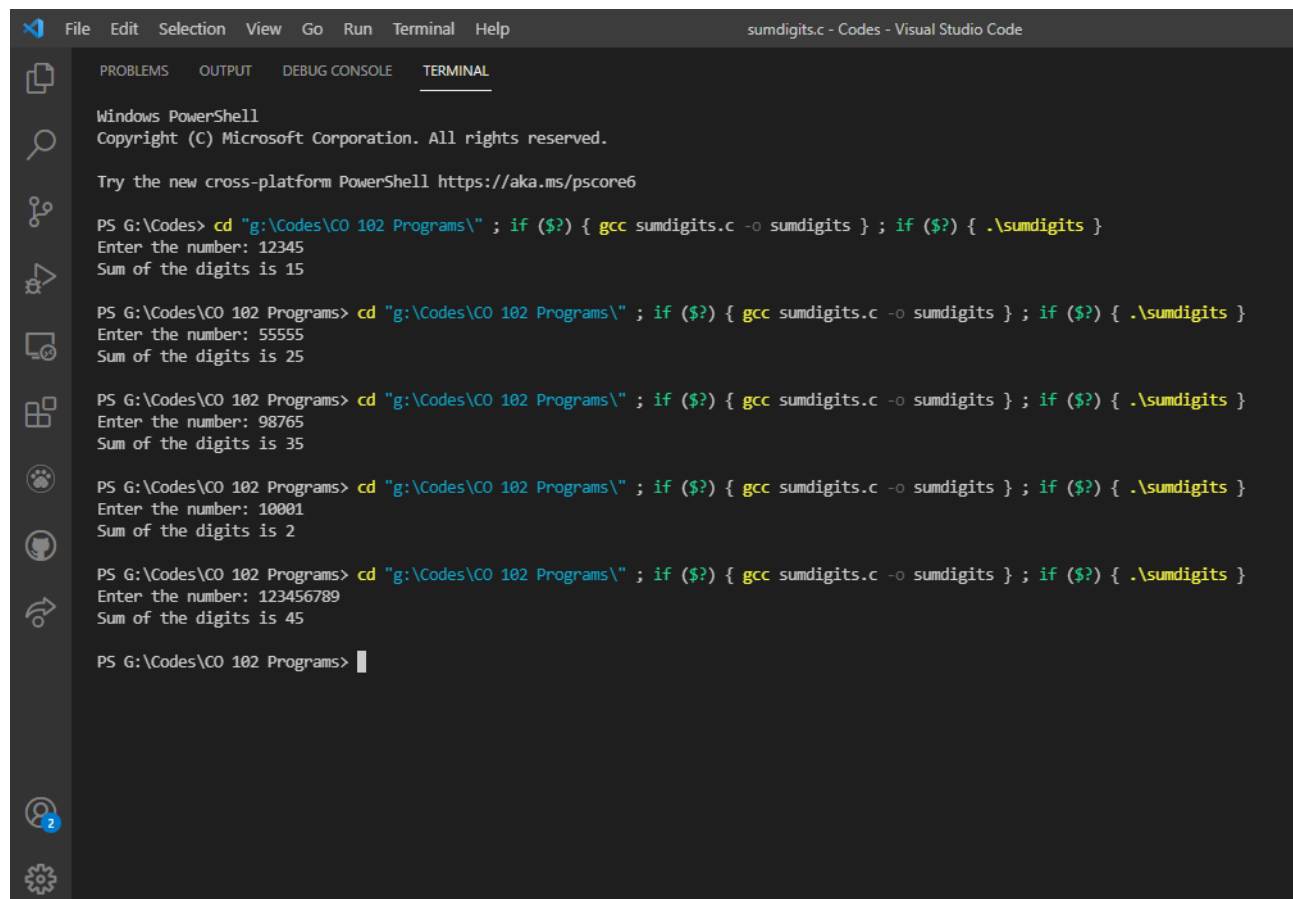
AIM: Write a C program to find the sum of a 5 digit number.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    int x;
    printf("Enter the number: ");
    scanf("%d",&x);
    int n=x,sum=0;
    while(n!=0)
    {
        sum=sum+n%10;
        n=n/10;
    }
    printf("Sum of the digits is %d\n\n",sum);
    return 0;
}
```

OUTPUT:

The screenshot shows the Visual Studio Code interface with the 'TERMINAL' tab active. The terminal window displays the execution of the C program 'sumdigits.c'. It shows the compilation command 'gcc sumdigits.c -o sumdigits' and the execution of the resulting binary '.\sumdigits'. The program prompts the user to 'Enter the number:' and then outputs the 'Sum of the digits'. Five test cases are shown with different input numbers: 12345, 55555, 98765, 10001, and 123456789. The output for each case is the sum of its digits: 15, 25, 35, 2, and 45 respectively. The terminal window title is 'sumdigits.c - Codes - Visual Studio Code'.

```
sumdigits.c - Codes - Visual Studio Code

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS G:\Codes> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc sumdigits.c -o sumdigits } ; if ($?) { .\sumdigits }
Enter the number: 12345
Sum of the digits is 15

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc sumdigits.c -o sumdigits } ; if ($?) { .\sumdigits }
Enter the number: 55555
Sum of the digits is 25

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc sumdigits.c -o sumdigits } ; if ($?) { .\sumdigits }
Enter the number: 98765
Sum of the digits is 35

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc sumdigits.c -o sumdigits } ; if ($?) { .\sumdigits }
Enter the number: 10001
Sum of the digits is 2

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc sumdigits.c -o sumdigits } ; if ($?) { .\sumdigits }
Enter the number: 123456789
Sum of the digits is 45

PS G:\Codes\CO 102 Programs> 
```

EXPERIMENT 7

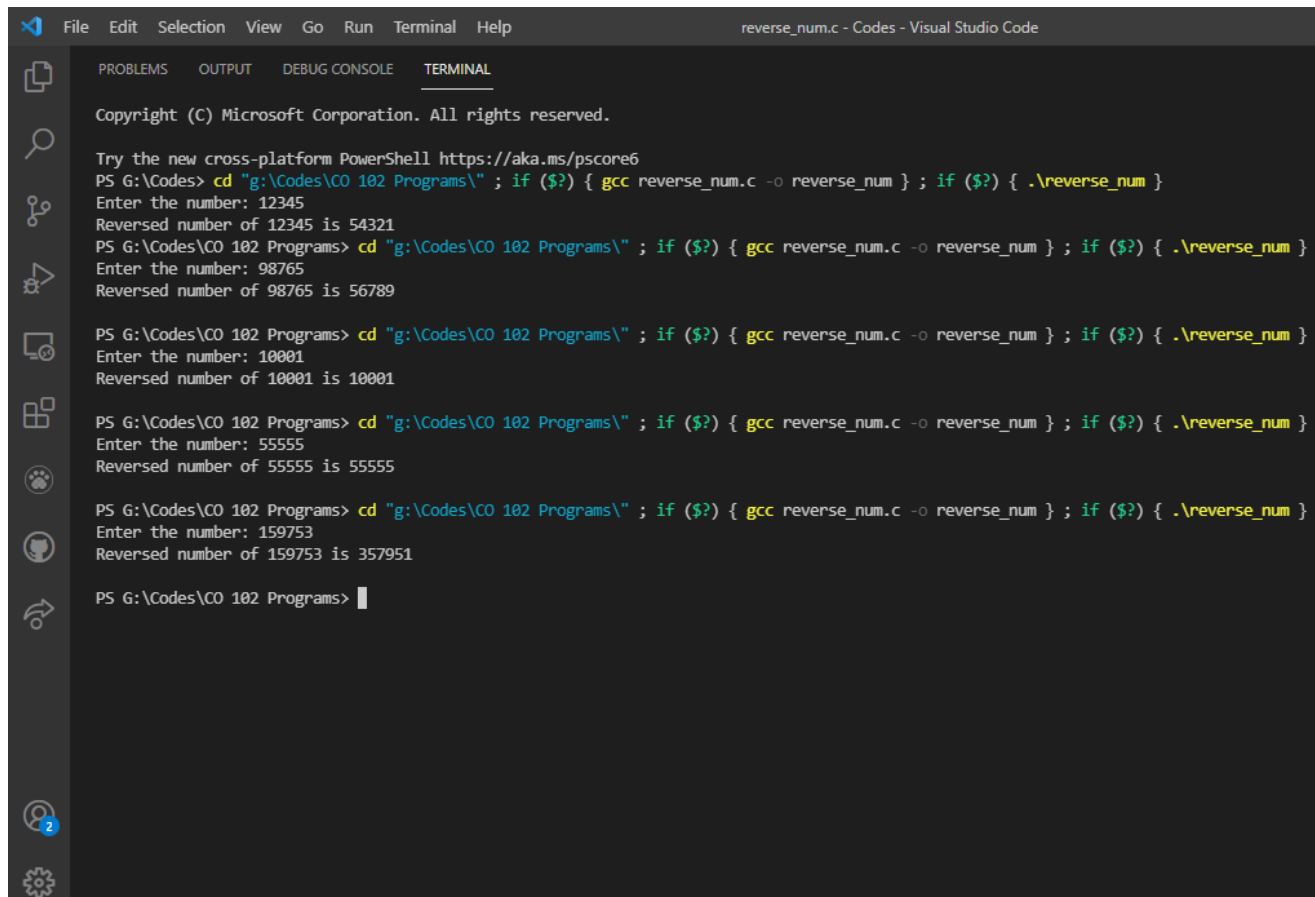
AIM: Write a C program to reverse a 5 digit number.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    int x;
    printf("Enter the number: ");
    scanf("%d",&x);
    int n=x,rev=0;
    while(n!=0)
    {
        rev=(rev*10)+(n%10);
        n=n/10;
    }
    printf("Reversed number of %d is %d\n\n",x,rev);
    return 0;
}
```

OUTPUT:



The screenshot shows the Visual Studio Code interface with the 'TERMINAL' tab active. The terminal displays the execution of the C program for five different inputs. Each time, the program prompts for a number, reads it, and outputs the reversed number.

```
reverse_num.c - Codes - Visual Studio Code

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

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Try the new cross-platform PowerShell https://aka.ms/pscore6
PS G:\Codes> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc reverse_num.c -o reverse_num } ; if ($?) { .\reverse_num }
Enter the number: 12345
Reversed number of 12345 is 54321
PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc reverse_num.c -o reverse_num } ; if ($?) { .\reverse_num }
Enter the number: 98765
Reversed number of 98765 is 56789

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc reverse_num.c -o reverse_num } ; if ($?) { .\reverse_num }
Enter the number: 10001
Reversed number of 10001 is 10001

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc reverse_num.c -o reverse_num } ; if ($?) { .\reverse_num }
Enter the number: 55555
Reversed number of 55555 is 55555

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc reverse_num.c -o reverse_num } ; if ($?) { .\reverse_num }
Enter the number: 159753
Reversed number of 159753 is 357951

PS G:\Codes\CO 102 Programs> 
```

EXPERIMENT 8

AIM: Write a C program to convert decimal to binary and vice versa.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    //Decimal to Binary Conversion

    int x,t,num,binary=0,a=1;
    printf("Enter the decimal number: ");
    scanf("%d",&x);
    printf("\n");
    num=x;

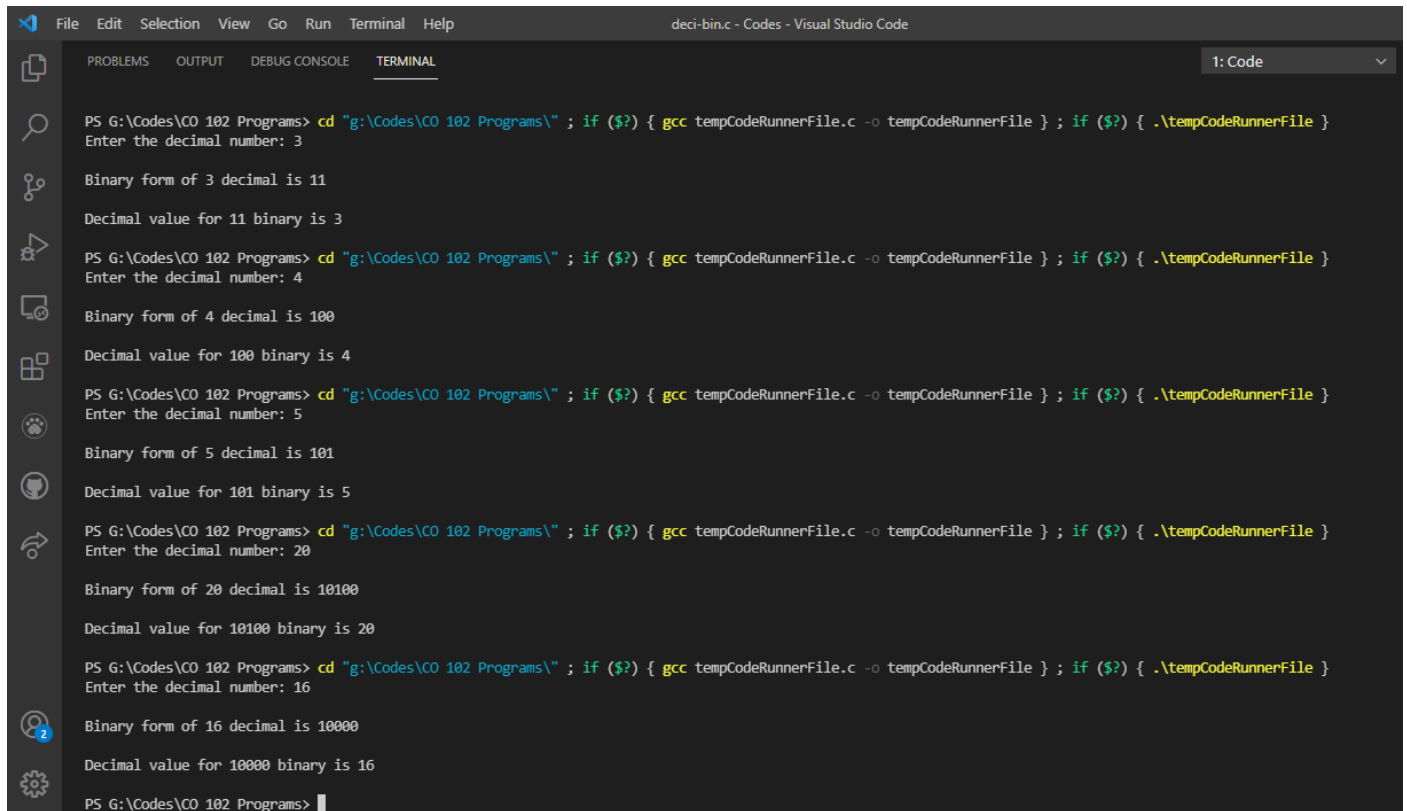
    while(num!=0)
    {
        t=num%2;
        num=(num-t)/2;
        if(t==1)
        {
            binary=binary+a;
            a=10*binary;
        }
        else if(t==0)
        {
            a=10*a;
        }
    }
    printf("Binary form of %d decimal is %d\n\n",x,binary);

    //Binary to Decimal conversion

    int pow=1,n=binary,deci=n%10;
    n=n/10;
    while(n!=0)
    {
        pow=pow*2;
        deci=deci+(n%10)*pow;
        n=n/10;
    }
    printf("Decimal value for %d binary is %d\n\n",binary,deci);

    return 0;
}
```

OUTPUT:



```
File Edit Selection View Go Run Terminal Help
deci-bin.c - Codes - Visual Studio Code

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL 1: Code

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc tempCodeRunnerFile.c -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Enter the decimal number: 3

Binary form of 3 decimal is 11

Decimal value for 11 binary is 3

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc tempCodeRunnerFile.c -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Enter the decimal number: 4

Binary form of 4 decimal is 100

Decimal value for 100 binary is 4

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc tempCodeRunnerFile.c -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Enter the decimal number: 5

Binary form of 5 decimal is 101

Decimal value for 101 binary is 5

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc tempCodeRunnerFile.c -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Enter the decimal number: 20

Binary form of 20 decimal is 10100

Decimal value for 10100 binary is 20

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc tempCodeRunnerFile.c -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Enter the decimal number: 16

Binary form of 16 decimal is 10000

Decimal value for 10000 binary is 16

PS G:\Codes\CO 102 Programs> 
```

EXPERIMENT 9

AIM: Write a C program to implement switch case statement.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    int num;
    printf("Enter the marks out of 100: ");
    scanf("%d",&num);
    printf("\n");
    switch(num/10)
    {
        case 10:
            printf("Grade is E\n\n");
            break;
        case 9:
            printf("Grade is O\n\n");
            break;
        case 8:
            printf("Grade is A+\n\n");
            break;
        case 7:
            printf("Grade is A\n\n");
            break;
        case 6:
            printf("Grade is B\n\n");
            break;
        case 5:
            printf("Grade is C\n\n");
            break;
        case 4:
            printf("Grade is D\n\n");
            break;
        default:
            printf("Grade is F\n\n");
            break;
    }
    return 0;
}
```

OUTPUT:

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
PS G:\Codes> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc switch.c -o switch } ; if ($?) { .\switch }  
Enter the marks out of 100: 100
```

Grade is E

```
PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc switch.c -o switch } ; if ($?) { .\switch }  
Enter the marks out of 100: 95
```

Grade is O

```
PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc switch.c -o switch } ; if ($?) { .\switch }  
Enter the marks out of 100: 82
```

Grade is A+

```
PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc switch.c -o switch } ; if ($?) { .\switch }  
Enter the marks out of 100: 76
```

Grade is A

```
PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc switch.c -o switch } ; if ($?) { .\switch }  
Enter the marks out of 100: 41
```

Grade is D

```
PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc switch.c -o switch } ; if ($?) { .\switch }  
Enter the marks out of 100: 39
```

Grade is F

```
PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc switch.c -o switch } ; if ($?) { .\switch }  
Enter the marks out of 100: 54
```

Grade is C

EXPERIMENT 10

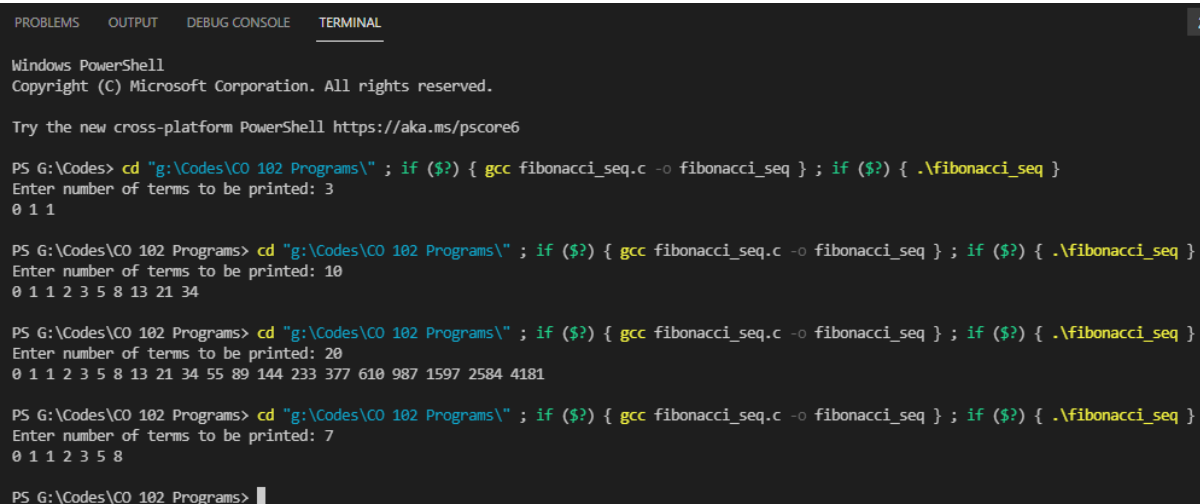
AIM: Write a C program to generate the Fibonacci sequence.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    int x1=0,x2=1,n,x;
    printf("Enter number of terms to be printed: ");
    scanf("%d",&n);
    if(n>=1){printf("%d",x1);}
    if(n>=2){printf(" %d",x2);}
    for(int i=2;i<n;++i)
    {
        x=x2;
        x2=x2+x1;
        x1=x;
        printf(" %d",x2);
    }
    printf("\n\n");
    return 0;
}
```

OUTPUT:



```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  2: Code  v
Windows PowerShell
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PS G:\Codes> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc fibonacci_seq.c -o fibonacci_seq } ; if ($?) { .\fibonacci_seq }
Enter number of terms to be printed: 3
0 1 1

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc fibonacci_seq.c -o fibonacci_seq } ; if ($?) { .\fibonacci_seq }
Enter number of terms to be printed: 10
0 1 1 2 3 5 8 13 21 34

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc fibonacci_seq.c -o fibonacci_seq } ; if ($?) { .\fibonacci_seq }
Enter number of terms to be printed: 20
0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc fibonacci_seq.c -o fibonacci_seq } ; if ($?) { .\fibonacci_seq }
Enter number of terms to be printed: 7
0 1 1 2 3 5 8

PS G:\Codes\CO 102 Programs> 
```

EXPERIMENT 11

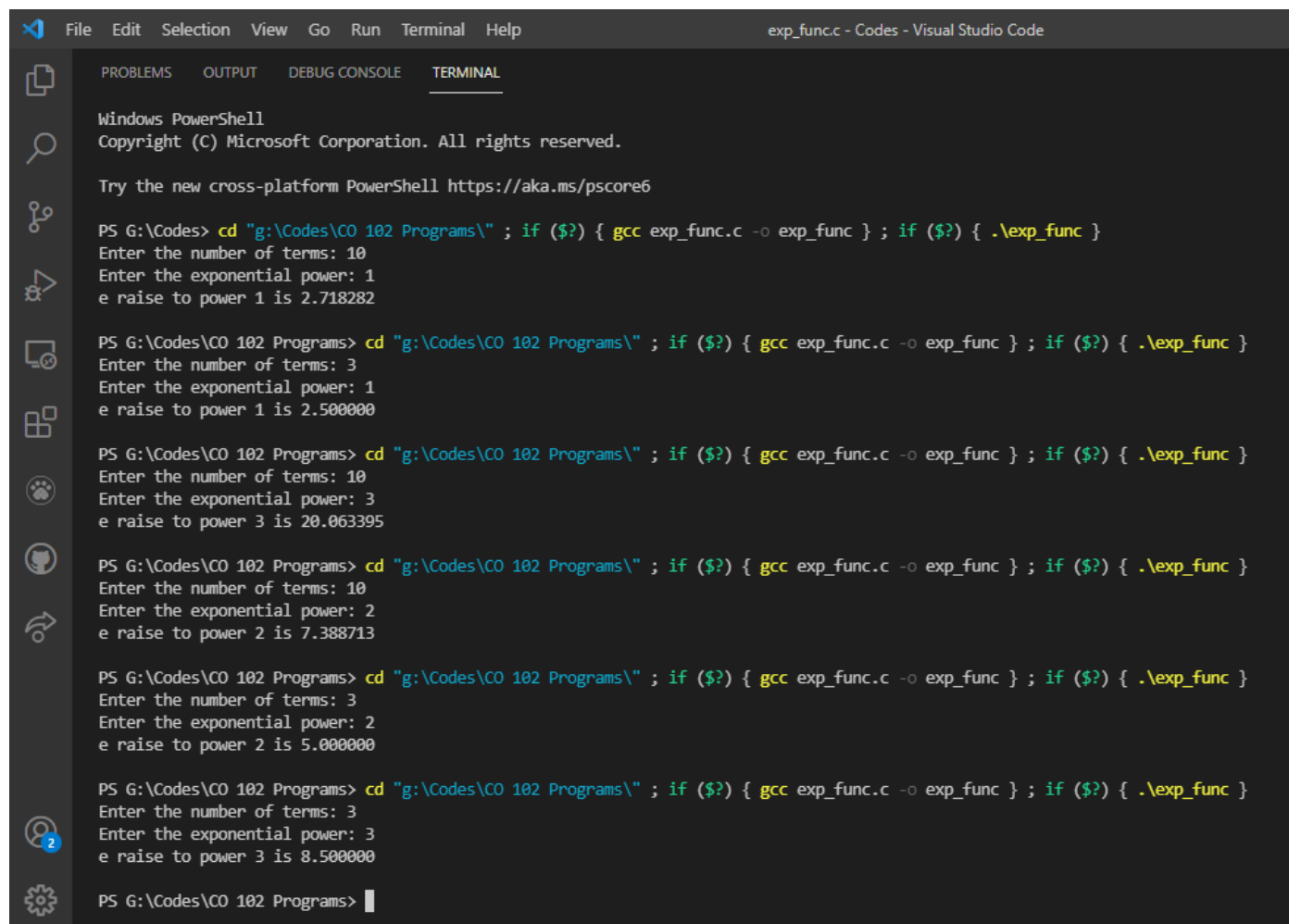
AIM: Write a C program to find exponential function.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    int n,pow;
    printf("Enter the number of terms: ");
    scanf("%d",&n);
    printf("Enter the exponential power: ");
    scanf("%d",&pow);
    float x,num=1;
    for(int i=1;i<n;++i)
    {
        x=1;
        for(int r=1;r<=i;++r)
        {
            x=x*(float)pow/r;
        }
        num=num+x;
    }
    printf("e raise to power %d is %f\n\n",pow,num);
    return 0;
}
```

OUTPUT:



```
exp_func.c - Codes - Visual Studio Code

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

Windows PowerShell
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PS G:\Codes> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc exp_func.c -o exp_func } ; if ($?) { .\exp_func }
Enter the number of terms: 10
Enter the exponential power: 1
e raise to power 1 is 2.718282

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc exp_func.c -o exp_func } ; if ($?) { .\exp_func }
Enter the number of terms: 3
Enter the exponential power: 1
e raise to power 1 is 2.500000

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc exp_func.c -o exp_func } ; if ($?) { .\exp_func }
Enter the number of terms: 10
Enter the exponential power: 3
e raise to power 3 is 20.063395

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc exp_func.c -o exp_func } ; if ($?) { .\exp_func }
Enter the number of terms: 10
Enter the exponential power: 2
e raise to power 2 is 7.388713

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc exp_func.c -o exp_func } ; if ($?) { .\exp_func }
Enter the number of terms: 3
Enter the exponential power: 2
e raise to power 2 is 5.000000

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc exp_func.c -o exp_func } ; if ($?) { .\exp_func }
Enter the number of terms: 3
Enter the exponential power: 3
e raise to power 3 is 8.500000

PS G:\Codes\C0 102 Programs> 
```

EXPERIMENT 12

AIM: Write a C program to search a number from an array using linear search.

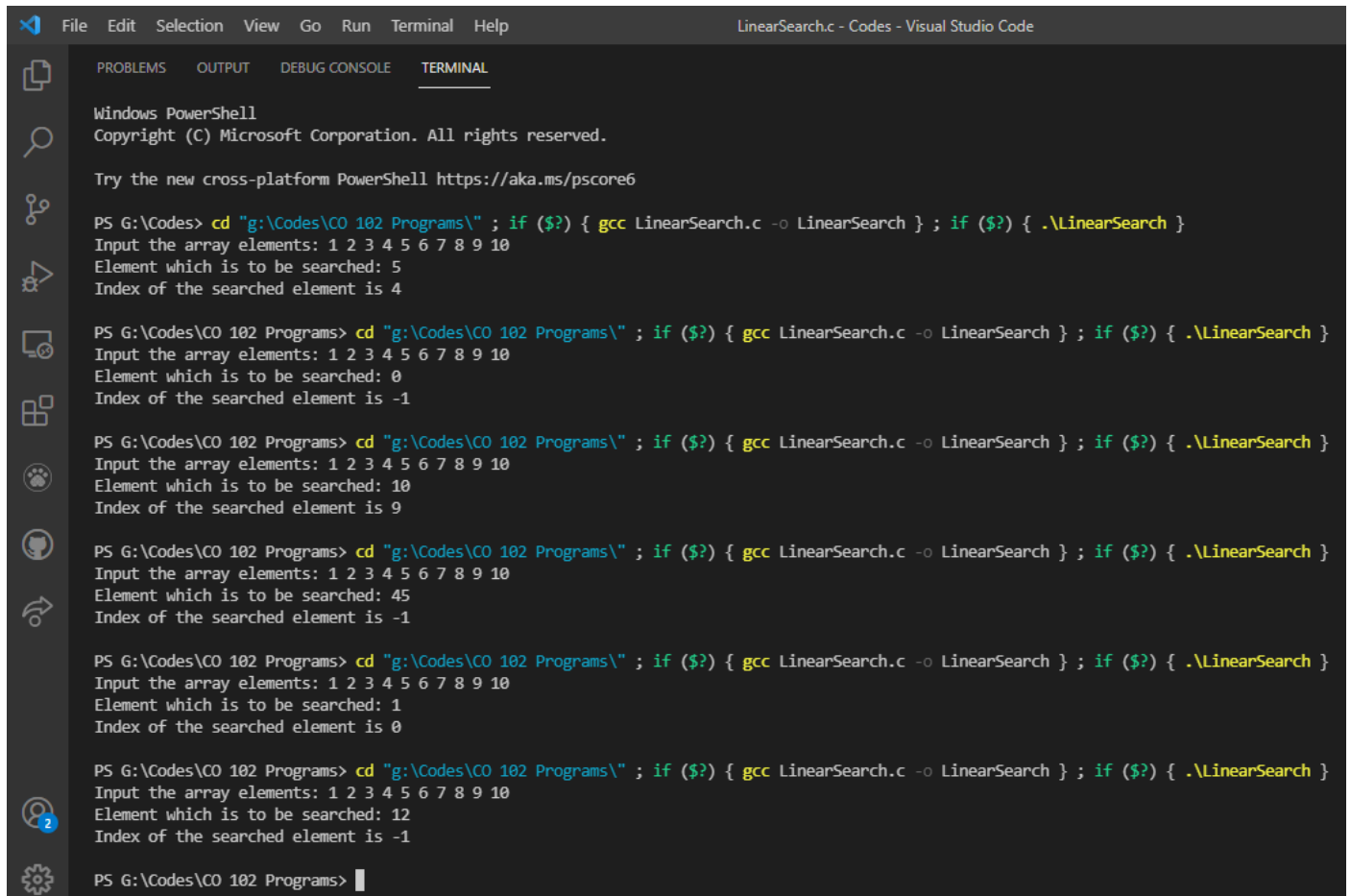
CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    int x[10],y;
    printf("Input the array elements: ");
    for(int i=0;i<10;++i)
    {
        scanf("%d",&x[i]);
    }
    printf("Element which is to be searched: ");
    scanf("%d",&y);

    int result=-1;
    for(int i=0;i<10;++i)
    {
        if(x[i]==y)
        {
            result=i;
        }
    }
    printf("Index of the searched element is %d\n\n",result);
    return 0;
}
```

OUTPUT:



The screenshot shows the Visual Studio Code interface with the 'TERMINAL' tab active. The terminal window displays the output of a Windows PowerShell session. The user has navigated to the directory 'G:\Codes\CO 102 Programs' and compiled a C program named 'LinearSearch.c' using 'gcc'. The program prompts the user to input an array of elements and a target element to search for. The output shows five separate runs of the program with different inputs and results.

```
Windows PowerShell
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PS G:\Codes> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc LinearSearch.c -o LinearSearch } ; if ($?) { .\LinearSearch }
Input the array elements: 1 2 3 4 5 6 7 8 9 10
Element which is to be searched: 5
Index of the searched element is 4

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc LinearSearch.c -o LinearSearch } ; if ($?) { .\LinearSearch }
Input the array elements: 1 2 3 4 5 6 7 8 9 10
Element which is to be searched: 0
Index of the searched element is -1

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc LinearSearch.c -o LinearSearch } ; if ($?) { .\LinearSearch }
Input the array elements: 1 2 3 4 5 6 7 8 9 10
Element which is to be searched: 10
Index of the searched element is 9

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc LinearSearch.c -o LinearSearch } ; if ($?) { .\LinearSearch }
Input the array elements: 1 2 3 4 5 6 7 8 9 10
Element which is to be searched: 45
Index of the searched element is -1

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc LinearSearch.c -o LinearSearch } ; if ($?) { .\LinearSearch }
Input the array elements: 1 2 3 4 5 6 7 8 9 10
Element which is to be searched: 1
Index of the searched element is 0

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc LinearSearch.c -o LinearSearch } ; if ($?) { .\LinearSearch }
Input the array elements: 1 2 3 4 5 6 7 8 9 10
Element which is to be searched: 12
Index of the searched element is -1

PS G:\Codes\CO 102 Programs> |
```

EXPERIMENT 13

AIM: Write a C program to search a number from an array using binary search.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    int x[100],y,n;
    printf("No. of elements in the array: ");
    scanf("%d",&n);
    printf("Input the array elements in increasing order: ");
    for(int i=0;i<n;++i)
    {
        scanf("%d",x+i);
    }
    printf("Element which is to be searched: ");
    scanf("%d",&y);

    int low=0,high=n-1;
    int mid,result=-1;
    while(low<=high)
    {
        mid=(low+high)/2;
        if(x[mid]==y)
        {
            result=mid;
            break;
        }
        if(x[mid]<y)
        {
            low=mid+1;
        }
        if(x[mid]>y)
        {
            high=mid-1;
        }
        if(low>high)
            break;
    }
    printf("Index of the searched element is %d\n\n",result);

    return 0;
}
```

OUTPUT:

```
File Edit Selection View Go Run Terminal Help BinarySearch.c - Codes - Visual Studio Code

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

PS G:\Codes> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc BinarySearch.c -o BinarySearch } ; if ($?) { .\BinarySearch }
No. of elements in the array: 10
Input the array elements in increasing order: 1 2 3 4 5 6 7 8 9 10
Element which is to be searched: 1
Index of the searched element is 0

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc BinarySearch.c -o BinarySearch } ; if ($?) { .\BinarySearch }
No. of elements in the array: 10
Input the array elements in increasing order: 1 2 3 4 5 6 7 8 9 10
Element which is to be searched: 10
Index of the searched element is 9

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc BinarySearch.c -o BinarySearch } ; if ($?) { .\BinarySearch }
No. of elements in the array: 10
Input the array elements in increasing order: 1 2 3 4 5 6 7 8 9 10
Element which is to be searched: 0
Index of the searched element is -1

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc BinarySearch.c -o BinarySearch } ; if ($?) { .\BinarySearch }
No. of elements in the array: 10
Input the array elements in increasing order: 1 2 3 4 5 6 7 8 9 10
Element which is to be searched: 11
Index of the searched element is -1

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc BinarySearch.c -o BinarySearch } ; if ($?) { .\BinarySearch }
No. of elements in the array: 10
Input the array elements in increasing order: 1 2 3 4 5 6 7 8 9 10
Element which is to be searched: 3
Index of the searched element is 2

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc BinarySearch.c -o BinarySearch } ; if ($?) { .\BinarySearch }
No. of elements in the array: 10
Input the array elements in increasing order: 1 2 3 4 5 6 7 8 9 10
Element which is to be searched: 7
Index of the searched element is 6
```

EXPERIMENT 14

AIM: Write a C program to sort an array using Bubble sort.

CODE:

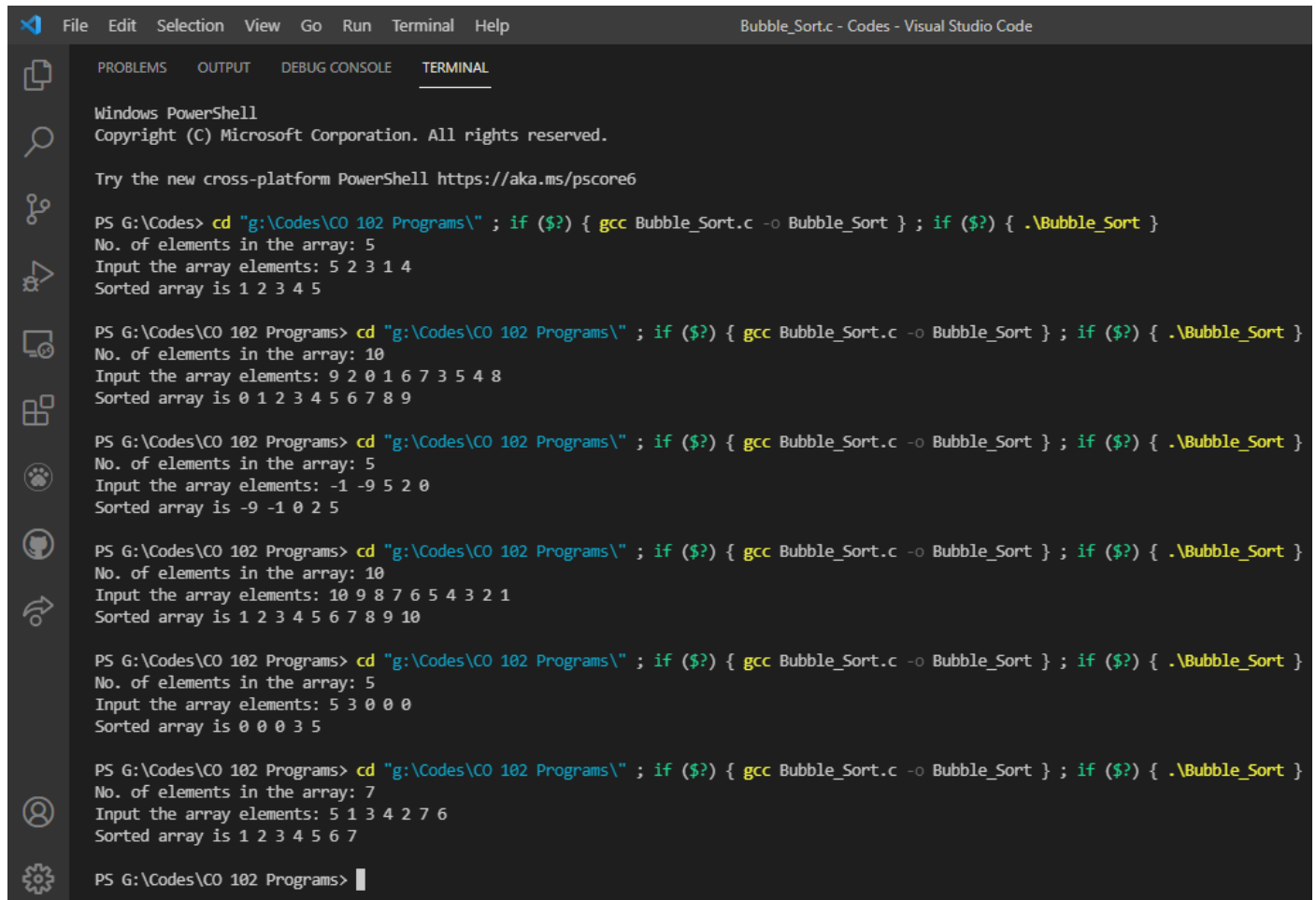
```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    int arr[100],n;
    printf("No. of elements in the array: ");
    scanf("%d",&n);
    printf("Input the array elements: ");
    for(int i=0;i<n;++i)
    {
        scanf("%d",arr+i);
    }

    int temp;
    for(int j=0;j<n-1;++j)
    {
        for(int i=0;i<n-j-1;++i)
        {
            if(arr[i]>arr[i+1])
            {
                temp=arr[i];
                arr[i]=arr[i+1];
                arr[i+1]=temp;
            }
        }
    }

    printf("Sorted array is");
    for(int i=0;i<n;++i)
    {
        printf(" %d",arr[i]);
    }
    printf("\n\n");
    return 0;
}
```


OUTPUT:



The screenshot shows the Visual Studio Code interface with the 'Bubble_Sort.c - Codes - Visual Studio Code' window. The 'TERMINAL' tab is active, displaying the output of a Windows PowerShell session. The session starts with the standard Windows PowerShell copyright notice and a link to the cross-platform PowerShell. The user then runs a series of commands to compile and execute a bubble sort program. Each command block includes the directory path, the compilation command, the execution command, the number of elements in the array, the input elements, and the sorted array output.

```
File Edit Selection View Go Run Terminal Help
Bubble_Sort.c - Codes - Visual Studio Code

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Windows PowerShell
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PS G:\Codes> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc Bubble_Sort.c -o Bubble_Sort } ; if ($?) { .\Bubble_Sort }
No. of elements in the array: 5
Input the array elements: 5 2 3 1 4
Sorted array is 1 2 3 4 5

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc Bubble_Sort.c -o Bubble_Sort } ; if ($?) { .\Bubble_Sort }
No. of elements in the array: 10
Input the array elements: 9 2 0 1 6 7 3 5 4 8
Sorted array is 0 1 2 3 4 5 6 7 8 9

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc Bubble_Sort.c -o Bubble_Sort } ; if ($?) { .\Bubble_Sort }
No. of elements in the array: 5
Input the array elements: -1 -9 5 2 0
Sorted array is -9 -1 0 2 5

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc Bubble_Sort.c -o Bubble_Sort } ; if ($?) { .\Bubble_Sort }
No. of elements in the array: 10
Input the array elements: 10 9 8 7 6 5 4 3 2 1
Sorted array is 1 2 3 4 5 6 7 8 9 10

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc Bubble_Sort.c -o Bubble_Sort } ; if ($?) { .\Bubble_Sort }
No. of elements in the array: 5
Input the array elements: 5 3 0 0 0
Sorted array is 0 0 0 3 5

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc Bubble_Sort.c -o Bubble_Sort } ; if ($?) { .\Bubble_Sort }
No. of elements in the array: 7
Input the array elements: 5 1 3 4 2 7 6
Sorted array is 1 2 3 4 5 6 7

PS G:\Codes\CO 102 Programs> 
```

EXPERIMENT 15

AIM: Write a C program to sort an array using selection sort.

CODE:

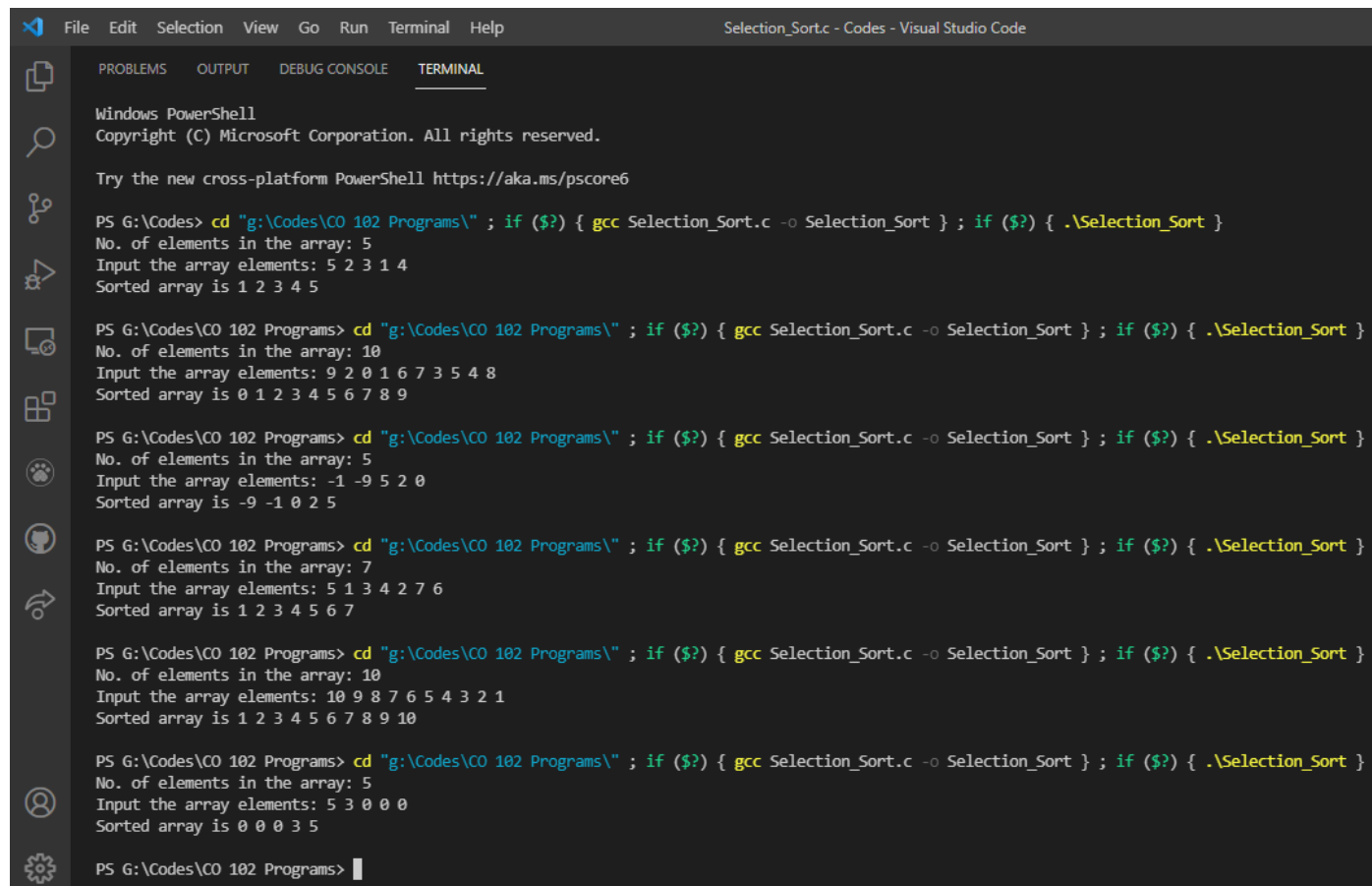
```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    int arr[100],n;
    printf("No. of elements in the array: ");
    scanf("%d",&n);
    printf("Input the array elements: ");
    for(int i=0;i<n;++i)
    {
        scanf("%d",arr+i);
    }

    int min,temp,index;
    for(int i=0;i<n;++i)
    {
        min=arr[i];
        index=i;
        for(int j=i+1;j<n;++j)
        {
            if(arr[j]<min)
            {
                min=arr[j];
                index=j;
            }
        }
        temp=arr[i];
        arr[i]=arr[index];
        arr[index]=temp;
    }

    printf("Sorted array is");
    for(int i=0;i<n;++i)
    {
        printf(" %d",arr[i]);
    }
    printf("\n\n");
    return 0;
}
```

OUTPUT:



The screenshot shows a Visual Studio Code window with a terminal open. The terminal title is "Selection_Sort.c - Codes - Visual Studio Code". The terminal content shows the execution of a C program that implements selection sort. The program prompts the user for the number of elements in the array and the elements themselves, then outputs the sorted array.

```
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PS G:\Codes> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc Selection_Sort.c -o Selection_Sort } ; if ($?) { .\Selection_Sort }
No. of elements in the array: 5
Input the array elements: 5 2 3 1 4
Sorted array is 1 2 3 4 5

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc Selection_Sort.c -o Selection_Sort } ; if ($?) { .\Selection_Sort }
No. of elements in the array: 10
Input the array elements: 9 2 0 1 6 7 3 5 4 8
Sorted array is 0 1 2 3 4 5 6 7 8 9

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc Selection_Sort.c -o Selection_Sort } ; if ($?) { .\Selection_Sort }
No. of elements in the array: 5
Input the array elements: -1 -9 5 2 0
Sorted array is -9 -1 0 2 5

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc Selection_Sort.c -o Selection_Sort } ; if ($?) { .\Selection_Sort }
No. of elements in the array: 7
Input the array elements: 5 1 3 4 2 7 6
Sorted array is 1 2 3 4 5 6 7

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc Selection_Sort.c -o Selection_Sort } ; if ($?) { .\Selection_Sort }
No. of elements in the array: 10
Input the array elements: 10 9 8 7 6 5 4 3 2 1
Sorted array is 1 2 3 4 5 6 7 8 9 10

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc Selection_Sort.c -o Selection_Sort } ; if ($?) { .\Selection_Sort }
No. of elements in the array: 5
Input the array elements: 5 3 0 0 0
Sorted array is 0 0 0 3 5

PS G:\Codes\CO 102 Programs> 
```

EXPERIMENT 16

AIM: Write a C program to sort an array using insertion sort.

CODE:

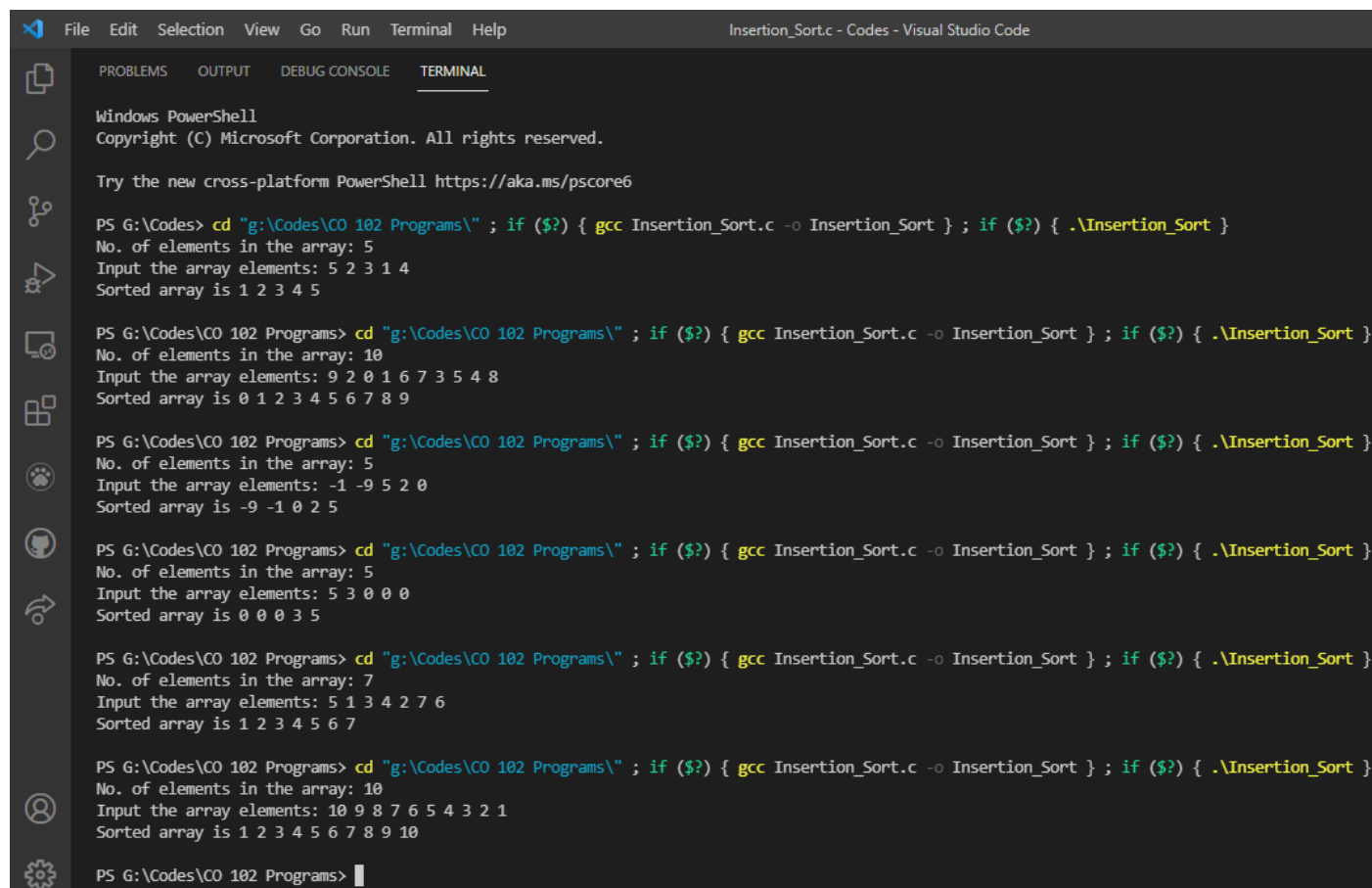
```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    int arr[100],n;
    printf("No. of elements in the array: ");
    scanf("%d",&n);
    printf("Input the array elements: ");
    for(int i=0;i<n;++i)
    {
        scanf("%d",arr+i);
    }

    int temp,k;
    for(int i=1;i<n;++i)
    {
        temp=arr[i];
        k=i;
        while(k>0 && arr[k-1]>temp)
        {
            arr[k]=arr[k-1];
            k--;
        }
        arr[k]=temp;
    }

    printf("Sorted array is");
    for(int i=0;i<n;++i)
    {
        printf(" %d",arr[i]);
    }
    printf("\n\n");
    return 0;
}
```

OUTPUT:



The screenshot shows the Visual Studio Code interface with the 'TERMINAL' tab active. The terminal is running a Windows PowerShell session. The user has navigated to the directory 'g:\Codes\C0 102 Programs' and executed a C program named 'Insertion_Sort.c'. The program prompts for the number of elements in the array and then the elements themselves. It then displays the sorted array. The terminal shows six separate runs of the program with different input arrays.

```
File Edit Selection View Go Run Terminal Help
Insertion_Sort.c - Codes - Visual Studio Code

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Windows PowerShell
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PS G:\Codes> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc Insertion_Sort.c -o Insertion_Sort } ; if ($?) { .\Insertion_Sort }
No. of elements in the array: 5
Input the array elements: 5 2 3 1 4
Sorted array is 1 2 3 4 5

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc Insertion_Sort.c -o Insertion_Sort } ; if ($?) { .\Insertion_Sort }
No. of elements in the array: 10
Input the array elements: 9 2 0 1 6 7 3 5 4 8
Sorted array is 0 1 2 3 4 5 6 7 8 9

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc Insertion_Sort.c -o Insertion_Sort } ; if ($?) { .\Insertion_Sort }
No. of elements in the array: 5
Input the array elements: -1 -9 5 2 0
Sorted array is -9 -1 0 2 5

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc Insertion_Sort.c -o Insertion_Sort } ; if ($?) { .\Insertion_Sort }
No. of elements in the array: 5
Input the array elements: 5 3 0 0 0
Sorted array is 0 0 0 3 5

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc Insertion_Sort.c -o Insertion_Sort } ; if ($?) { .\Insertion_Sort }
No. of elements in the array: 7
Input the array elements: 5 1 3 4 2 7 6
Sorted array is 1 2 3 4 5 6 7

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc Insertion_Sort.c -o Insertion_Sort } ; if ($?) { .\Insertion_Sort }
No. of elements in the array: 10
Input the array elements: 10 9 8 7 6 5 4 3 2 1
Sorted array is 1 2 3 4 5 6 7 8 9 10

PS G:\Codes\C0 102 Programs> 
```

EXPERIMENT 17

AIM: Write a C program to factorial of a number using recursion.

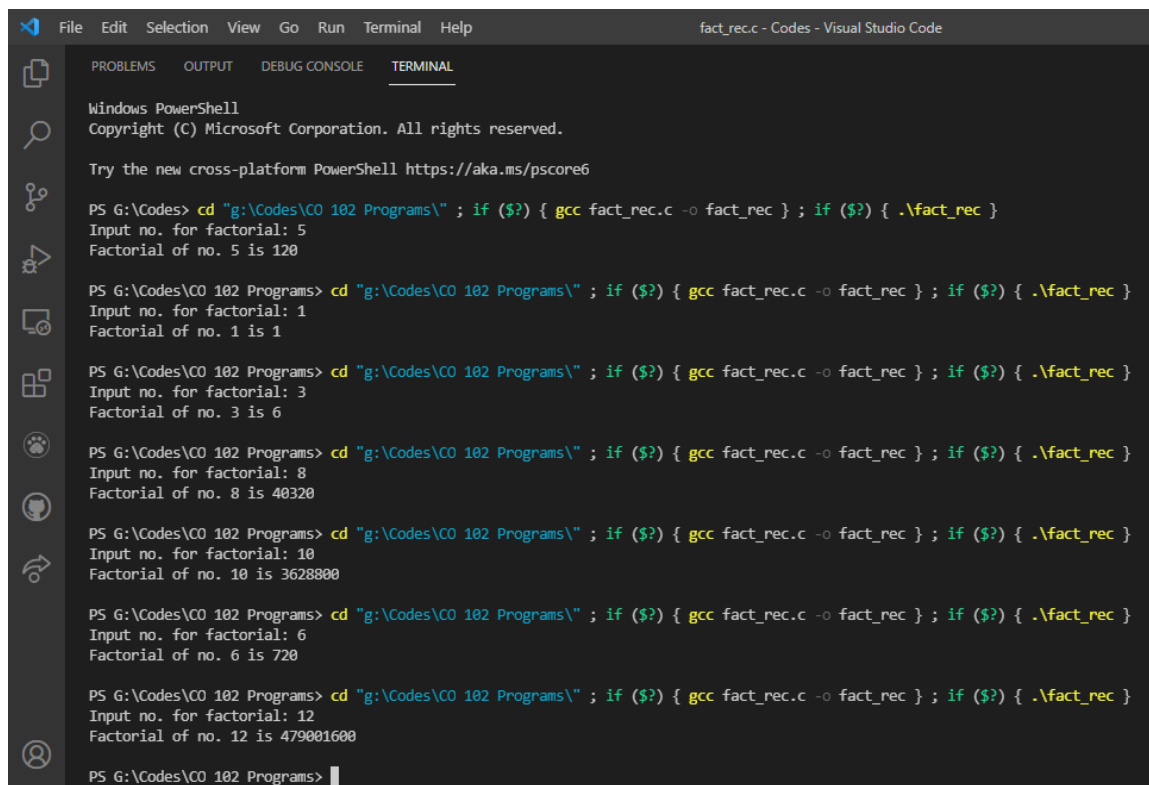
CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int fact(int x)
{
    if(x==0 || x==1)
        return 1;
    else
        return x*fact(x-1);
}

int main()
{
    int x;
    printf("Input no. for factorial: ");
    scanf("%d",&x);
    int factorial=fact(x);
    printf("Factorial of no. %d is %d\n\n",x,factorial);
    return 0;
}
```

OUTPUT:



The screenshot shows the Visual Studio Code interface with the 'TERMINAL' tab active. The terminal displays the execution of the C program for various inputs. The command used to compile and run the program is `gcc fact_rec.c -o fact_rec ; if ($?) { .\fact_rec }`. The program prompts for an input number and then prints the factorial of that number.

```
fact_rec.c - Codes - Visual Studio Code

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

Windows PowerShell
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PS G:\Codes> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc fact_rec.c -o fact_rec } ; if ($?) { .\fact_rec }
Input no. for factorial: 5
Factorial of no. 5 is 120

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc fact_rec.c -o fact_rec } ; if ($?) { .\fact_rec }
Input no. for factorial: 1
Factorial of no. 1 is 1

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc fact_rec.c -o fact_rec } ; if ($?) { .\fact_rec }
Input no. for factorial: 3
Factorial of no. 3 is 6

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc fact_rec.c -o fact_rec } ; if ($?) { .\fact_rec }
Input no. for factorial: 8
Factorial of no. 8 is 40320

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc fact_rec.c -o fact_rec } ; if ($?) { .\fact_rec }
Input no. for factorial: 10
Factorial of no. 10 is 3628800

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc fact_rec.c -o fact_rec } ; if ($?) { .\fact_rec }
Input no. for factorial: 6
Factorial of no. 6 is 720

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc fact_rec.c -o fact_rec } ; if ($?) { .\fact_rec }
Input no. for factorial: 12
Factorial of no. 12 is 479001600

PS G:\Codes\CO 102 Programs> |
```

EXPERIMENT 18

AIM: Write a C program to Fibonacci sequence using recursion.

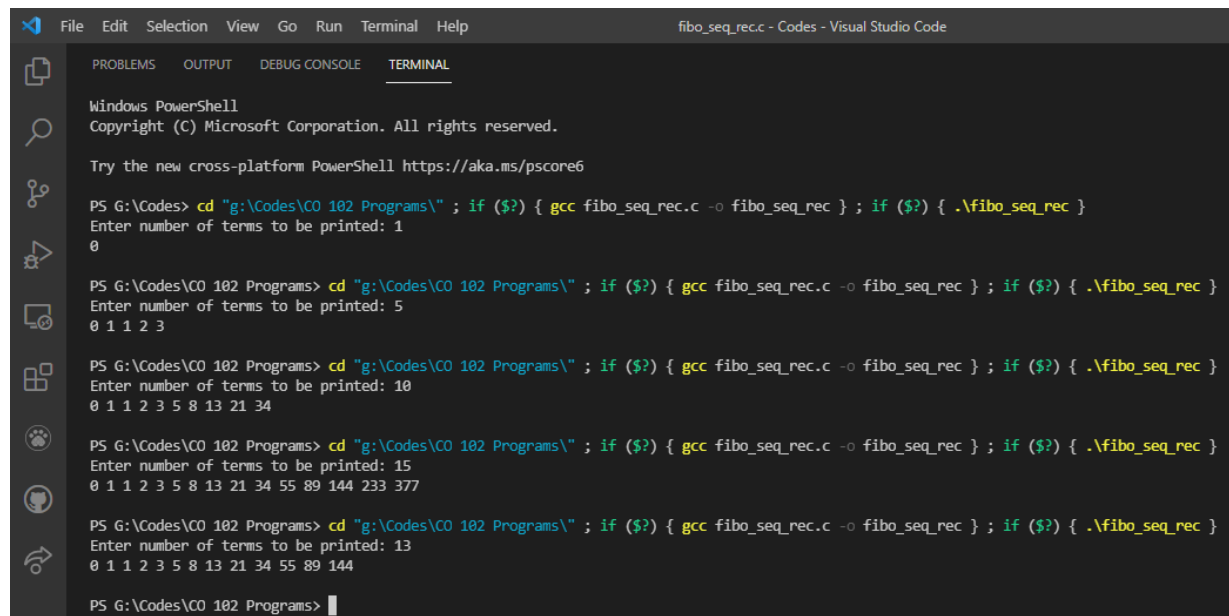
CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int fibo(int n, int x, int y)
{
    if(n==0)
        return 0;
    else
        printf(" %d",y);
    return fibo(n-1,y,x+y);
}

int main()
{
    int n,x,y;
    printf("Enter number of terms to be printed: ");
    scanf("%d",&n);
    x=0,y=1;
    if(n>=1)
        printf("%d",x);
    fibo(n-1,0,1);
    printf("\n\n");
    return 0;
}
```

OUTPUT:



```
fibonacci - Codes - Visual Studio Code

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Windows PowerShell
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PS G:\Codes> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc fibo_seq_rec.c -o fibo_seq_rec } ; if ($?) { .\fibo_seq_rec }
Enter number of terms to be printed: 1
0

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc fibo_seq_rec.c -o fibo_seq_rec } ; if ($?) { .\fibo_seq_rec }
Enter number of terms to be printed: 5
0 1 1 2 3

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc fibo_seq_rec.c -o fibo_seq_rec } ; if ($?) { .\fibo_seq_rec }
Enter number of terms to be printed: 10
0 1 1 2 3 5 8 13 21 34

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc fibo_seq_rec.c -o fibo_seq_rec } ; if ($?) { .\fibo_seq_rec }
Enter number of terms to be printed: 15
0 1 1 2 3 5 8 13 21 34 55 89 144 233 377

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc fibo_seq_rec.c -o fibo_seq_rec } ; if ($?) { .\fibo_seq_rec }
Enter number of terms to be printed: 13
0 1 1 2 3 5 8 13 21 34 55 89 144

PS G:\Codes\C0 102 Programs> |
```

EXPERIMENT 19

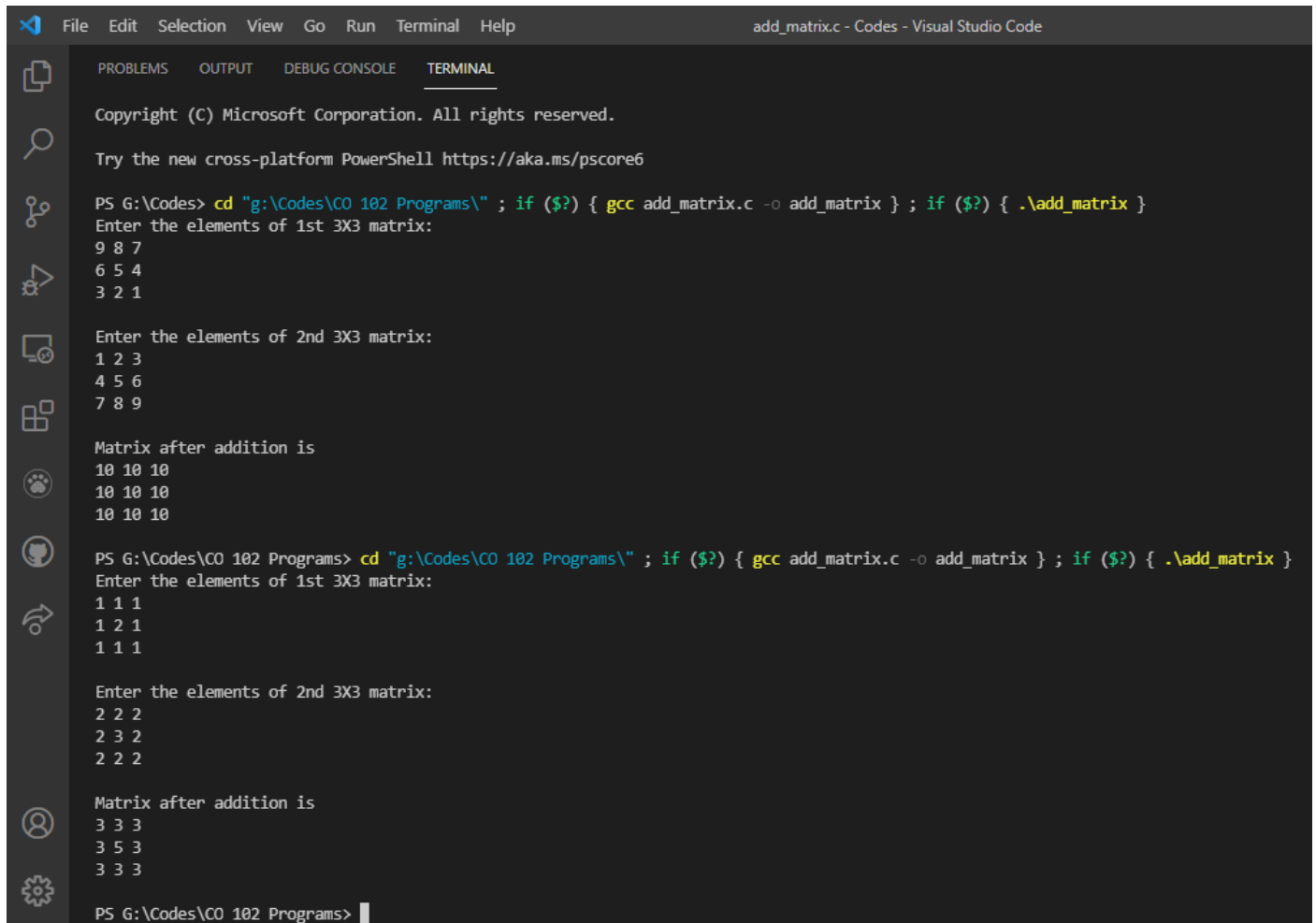
AIM: Write a C program for the addition of two 3 x 3 matrices.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    int x[3][3],y[3][3],z[3][3];
    printf("Enter the elements of 1st 3X3 matrix:\n");
    for(int i=0;i<3;++i){
        for(int j=0;j<3;++j){
            scanf("%d",&x[i][j]);
        }
    }
    printf("\nEnter the elements of 2nd 3X3 matrix:\n");
    for(int i=0;i<3;++i){
        for(int j=0;j<3;++j){
            scanf("%d",&y[i][j]);
        }
    }
    printf("\nMatrix after addition is\n");
    for(int i=0;i<3;++i){
        for(int j=0;j<3;++j){
            z[i][j]=0;
            z[i][j]=x[i][j]+y[i][j];
        }
    }
    for(int i=0;i<3;++i){
        for(int j=0;j<3;++j){
            printf("%d ",z[i][j]);
        }
        printf("\n");
    }
    printf("\n");
    return 0;
}
```


OUTPUT:



```
add_matrix.c - Codes - Visual Studio Code

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS G:\Codes> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc add_matrix.c -o add_matrix } ; if ($?) { .\add_matrix }
Enter the elements of 1st 3X3 matrix:
9 8 7
6 5 4
3 2 1

Enter the elements of 2nd 3X3 matrix:
1 2 3
4 5 6
7 8 9

Matrix after addition is
10 10 10
10 10 10
10 10 10

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc add_matrix.c -o add_matrix } ; if ($?) { .\add_matrix }
Enter the elements of 1st 3X3 matrix:
1 1 1
1 2 1
1 1 1

Enter the elements of 2nd 3X3 matrix:
2 2 2
2 3 2
2 2 2

Matrix after addition is
3 3 3
3 5 3
3 3 3

PS G:\Codes\C0 102 Programs> 
```

EXPERIMENT 20

AIM: Write a C program to multiply two 3 x 3 matrices

CODE:

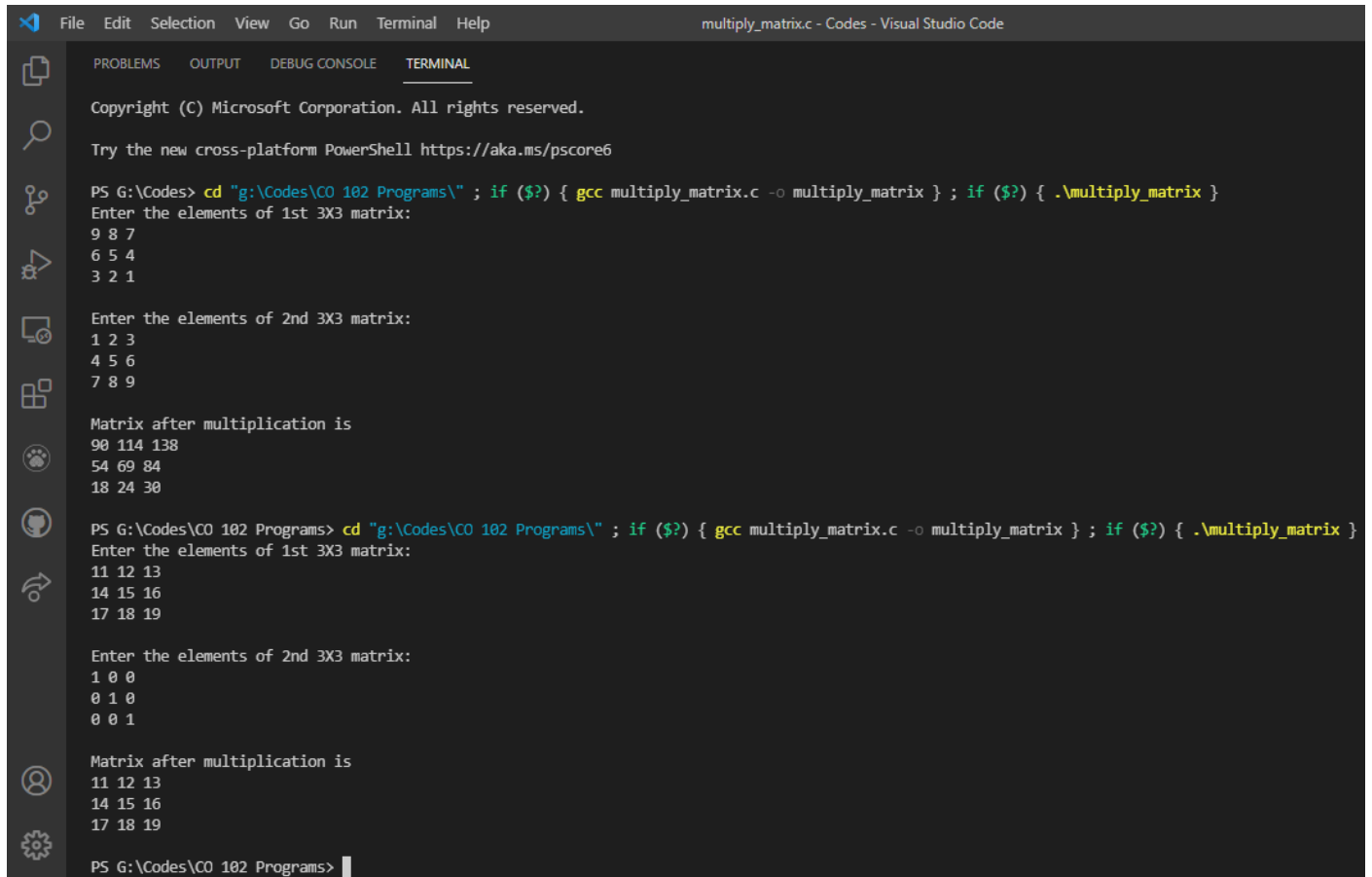
```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    int x[3][3],y[3][3],z[3][3];
    printf("Enter the elements of 1st 3X3 matrix:\n");
    for(int i=0;i<3;++i){
        for(int j=0;j<3;++j){
            scanf("%d",&x[i][j]);
        }
    }
    printf("\nEnter the elements of 2nd 3X3 matrix:\n");
    for(int i=0;i<3;++i){
        for(int j=0;j<3;++j){
            scanf("%d",&y[i][j]);
        }
    }
    int sum;
    printf("\nMatrix after multiplication is\n");

    for(int i=0;i<=2;++i){
        for(int j=0;j<=2;++j){
            sum=0;
            for(int k=0;k<=2;++k){
                sum=sum+(x[i][k])*(y[k][j]);
            }
            z[i][j]=sum;
        }
    }

    for(int i=0;i<3;++i){
        for(int j=0;j<3;++j){
            printf("%d ",z[i][j]);
        }
        printf("\n");
    }
    printf("\n");
    return 0;
}
```

OUTPUT:



```
File Edit Selection View Go Run Terminal Help
multiply_matrix.c - Codes - Visual Studio Code

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

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PS G:\Codes> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc multiply_matrix.c -o multiply_matrix } ; if ($?) { .\multiply_matrix }
Enter the elements of 1st 3X3 matrix:
9 8 7
6 5 4
3 2 1

Enter the elements of 2nd 3X3 matrix:
1 2 3
4 5 6
7 8 9

Matrix after multiplication is
90 114 138
54 69 84
18 24 30

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc multiply_matrix.c -o multiply_matrix } ; if ($?) { .\multiply_matrix }
Enter the elements of 1st 3X3 matrix:
11 12 13
14 15 16
17 18 19

Enter the elements of 2nd 3X3 matrix:
1 0 0
0 1 0
0 0 1

Matrix after multiplication is
11 12 13
14 15 16
17 18 19

PS G:\Codes\CO 102 Programs> 
```

EXPERIMENT 21

AIM: Write a C program to swap two numbers using pointers.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

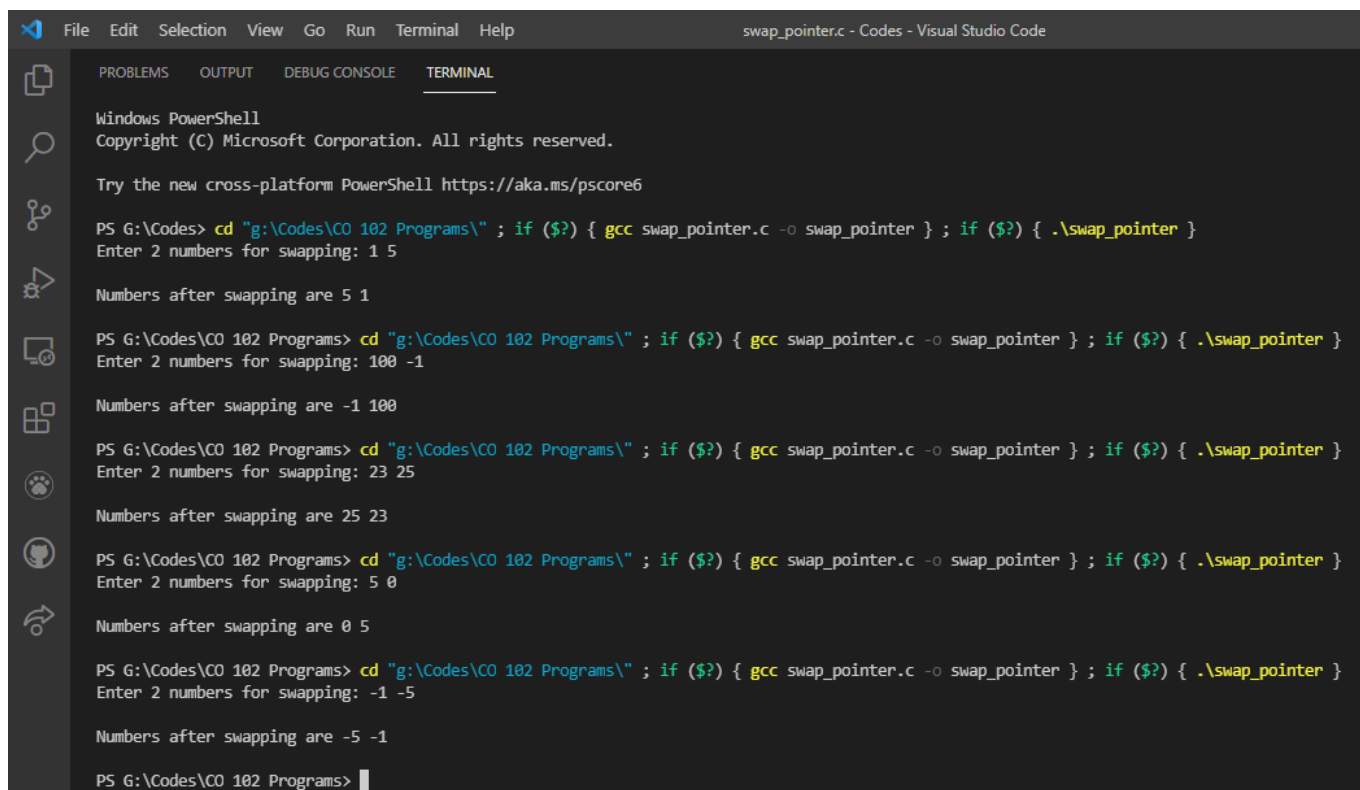
#include<stdio.h>
int main()
{
    int x,y,temp;
    printf("Enter 2 numbers for swapping: ");
    scanf("%d %d",&x,&y);

    int *a=&x;
    int *b=&y;

    temp=*a;
    *a=*b;
    *b=temp;

    printf("Numbers after swapping are %d %d",x,y);
    return 0;
}
```

OUTPUT:



```
swap_pointer.c - Codes - Visual Studio Code

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

Windows PowerShell
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PS G:\Codes> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc swap_pointer.c -o swap_pointer } ; if ($?) { .\swap_pointer }
Enter 2 numbers for swapping: 1 5

Numbers after swapping are 5 1

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc swap_pointer.c -o swap_pointer } ; if ($?) { .\swap_pointer }
Enter 2 numbers for swapping: 100 -1

Numbers after swapping are -1 100

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc swap_pointer.c -o swap_pointer } ; if ($?) { .\swap_pointer }
Enter 2 numbers for swapping: 23 25

Numbers after swapping are 25 23

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc swap_pointer.c -o swap_pointer } ; if ($?) { .\swap_pointer }
Enter 2 numbers for swapping: 5 0

Numbers after swapping are 0 5

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc swap_pointer.c -o swap_pointer } ; if ($?) { .\swap_pointer }
Enter 2 numbers for swapping: -1 -5

Numbers after swapping are -5 -1

PS G:\Codes\C0 102 Programs> 
```

EXPERIMENT 22

AIM: Write a C program to find the area and perimeter of a circle, rectangle, square and triangle using functions.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>

void circle()
{
    float r;
    printf("Input radius of the circle: ");
    scanf("%f",&r);
    printf("Area of circle is %.2f\nCircumference of circle is %.2f\n\n",3.14*r*r,2*3.14*r);
}

void rect()
{
    float l,b;
    printf("Input length and breadth of the rectangle: ");
    scanf("%f %f",&l,&b);
    printf("Area of rectangle is %.2f\nPerimeter of circle is %.2f\n\n",l*b,2*(l+b));
}

void sq()
{
    float a;
    printf("Input length of side of square: ");
    scanf("%f",&a);
    printf("Area of square is %.2f\nPerimeter of square is %.2f\n\n",a*a,4*a);
}

void triangle()
{
    float b,h,l1,l2;
    printf("Input length of base and height of triangle: ");
    scanf("%f %f",&b,&h);
    printf("Input length of other 2 sides of triangle: ");
    scanf("%f %f",&l1,&l2);
    printf("Area of triangle is %.2f\nPerimeter of triangle is %.2f\n\n",0.5*b*h,b+l1+l2);
}
```

```

int main()
{
    int n;
    printf("Write the no. of figure you want:\n");
    printf("1. Circle\n2. Rectangle\n3. Square\n4. Triangle\n");
    printf("Write the input: ");
    scanf("%d",&n);
    printf("\n");

    switch(n)
    {
        case 1:
            circle();
            break;
        case 2:
            rect();
            break;
        case 3:
            sq();
            break;
        case 4:
            triangle();
            break;
        default:
            printf("Invalid Input");
            break;
    }
    return 0;
}

```

OUTPUT:

```

area_func.c - Codes - Visual Studio Code

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

Windows PowerShell
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PS G:\Codes> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc area_func.c -o area_func } ; if ($?) { .\area_func }
Write the no. of figure you want:
1. Circle
2. Rectangle
3. Square
4. Triangle
Write the input: 1

Input radius of the circle: 5
Area of circle is 78.50
Circumference of circle is 31.40

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc area_func.c -o area_func } ; if ($?) { .\area_func }
Write the no. of figure you want:
1. Circle
2. Rectangle
3. Square
4. Triangle
Write the input: 4

Input length of base and height of triangle: 2 5
Input length of other 2 sides of triangle: 5 6
Area of triangle is 5.00
Perimeter of triangle is 13.00

PS G:\Codes\C0 102 Programs> 

```

EXPERIMENT 23

AIM: Write a C program to pass and return pointer to function hence calculate average of an array.

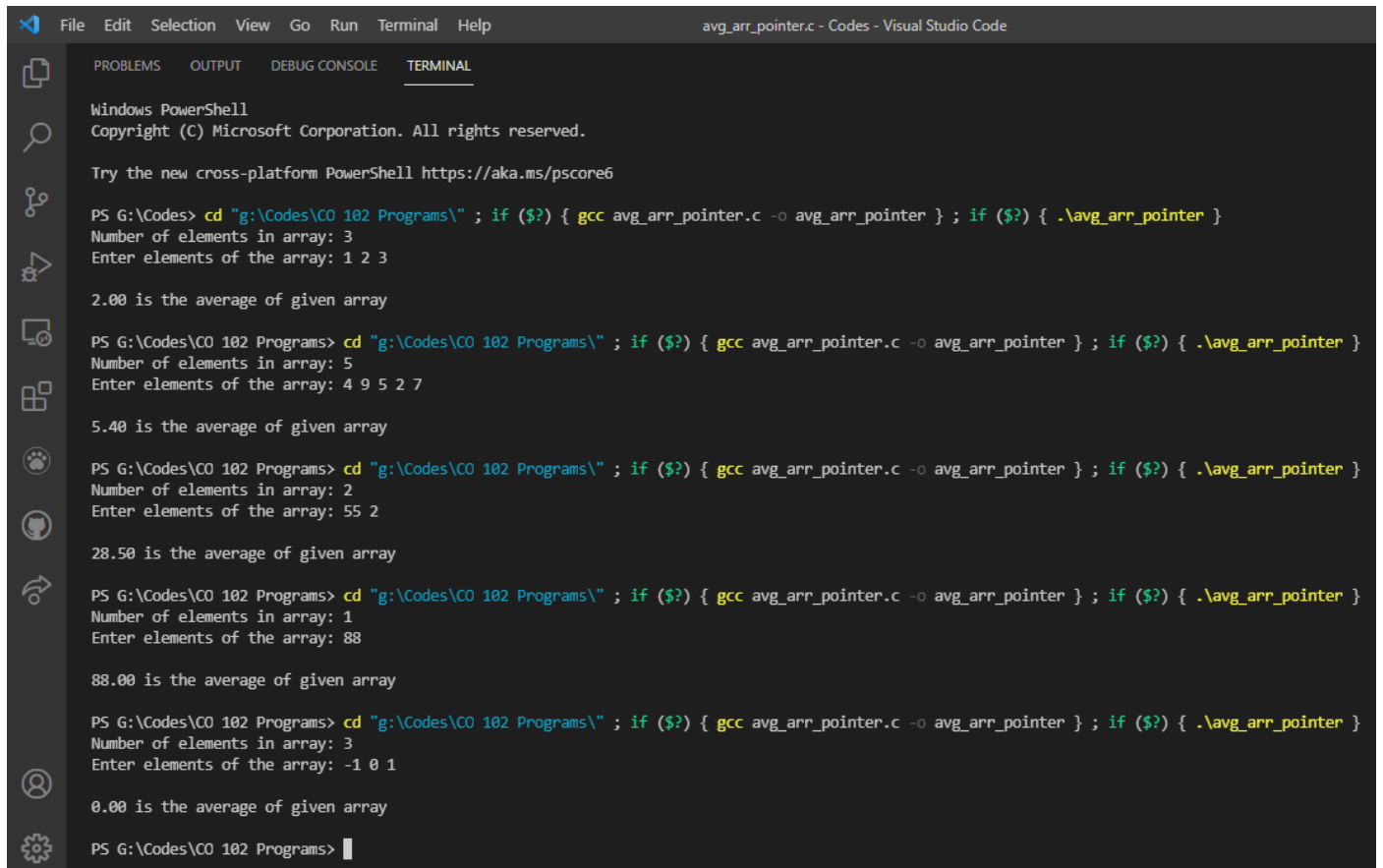
CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
float avg(int *p,int n)
{
    int sum=0;
    for(int i=0;i<n;++i){
        sum=sum+(*(p+i));}
    float average=(float)sum/n;
    return average;
}

int main()
{
    int arr[100],n;
    printf("Number of elements in array: ");
    scanf("%d",&n);
    printf("Enter elements of the array: ");
    for(int i=0;i<n;++i){
        scanf("%d",arr+i);}
    float *average;
    *average=avg(arr,n);
    printf("\n%.2f is the average of given array\n\n",*average);
    return 0;
}
```

OUTPUT:



The screenshot shows a Visual Studio Code window with the file 'avg_arr_pointer.c' open. The terminal panel is active, displaying the output of a Windows PowerShell session. The user has navigated to the directory 'G:\Codes\C0 102 Programs' and compiled the program 'avg_arr_pointer.c' using 'gcc'. They then executed the program five times, each time providing a different number of elements and values for an array. The program correctly calculated the average for each set of inputs.

```
File Edit Selection View Go Run Terminal Help
avg_arr_pointer.c - Codes - Visual Studio Code

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Windows PowerShell
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PS G:\Codes> cd "G:\Codes\C0 102 Programs\" ; if ($?) { gcc avg_arr_pointer.c -o avg_arr_pointer } ; if ($?) { .\avg_arr_pointer }
Number of elements in array: 3
Enter elements of the array: 1 2 3

2.00 is the average of given array

PS G:\Codes\C0 102 Programs> cd "G:\Codes\C0 102 Programs\" ; if ($?) { gcc avg_arr_pointer.c -o avg_arr_pointer } ; if ($?) { .\avg_arr_pointer }
Number of elements in array: 5
Enter elements of the array: 4 9 5 2 7

5.40 is the average of given array

PS G:\Codes\C0 102 Programs> cd "G:\Codes\C0 102 Programs\" ; if ($?) { gcc avg_arr_pointer.c -o avg_arr_pointer } ; if ($?) { .\avg_arr_pointer }
Number of elements in array: 2
Enter elements of the array: 55 2

28.50 is the average of given array

PS G:\Codes\C0 102 Programs> cd "G:\Codes\C0 102 Programs\" ; if ($?) { gcc avg_arr_pointer.c -o avg_arr_pointer } ; if ($?) { .\avg_arr_pointer }
Number of elements in array: 1
Enter elements of the array: 88

88.00 is the average of given array

PS G:\Codes\C0 102 Programs> cd "G:\Codes\C0 102 Programs\" ; if ($?) { gcc avg_arr_pointer.c -o avg_arr_pointer } ; if ($?) { .\avg_arr_pointer }
Number of elements in array: 3
Enter elements of the array: -1 0 1

0.00 is the average of given array

PS G:\Codes\C0 102 Programs> |
```


EXPERIMENT 24

AIM: Write a C program to pass an array as pointer to a function that calculates the sum of all elements of the array.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int sum(int *p,int n)
{
    int sum=0;
    for(int i=0;i<n;++i){
        sum=sum+(*(p+i));}
    return sum;
}

int main()
{
    int arr[100],n;
    printf("Number of elements in array: ");
    scanf("%d",&n);
    printf("Enter elements of the array: ");
    for(int i=0;i<n;++i){
        scanf("%d",arr+i);}

    int s=sum(arr,n);
    printf("\n%d is the sum of given array\n\n",s);
    return 0;
}
```

OUTPUT:

```
sum_arr_pointer.c - Codes - Visual Studio Code

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

Windows PowerShell
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PS G:\Codes> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc sum_arr_pointer.c -o sum_arr_pointer } ; if ($?) { .\sum_arr_pointer }
Number of elements in array: 3
Enter elements of the array: 1 2 3

6 is the sum of given array

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc sum_arr_pointer.c -o sum_arr_pointer } ; if ($?) { .\sum_arr_pointer }
Number of elements in array: 5
Enter elements of the array: 9 5 1 7 3

25 is the sum of given array

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc sum_arr_pointer.c -o sum_arr_pointer } ; if ($?) { .\sum_arr_pointer }
Number of elements in array: 5
Enter elements of the array: 1 2 3 4 5

15 is the sum of given array

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc sum_arr_pointer.c -o sum_arr_pointer } ; if ($?) { .\sum_arr_pointer }
Number of elements in array: 10
Enter elements of the array: 0 1 2 3 4 5 6 7 8 9

45 is the sum of given array

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc sum_arr_pointer.c -o sum_arr_pointer } ; if ($?) { .\sum_arr_pointer }
Number of elements in array: 3
Enter elements of the array: -1 0 1

0 is the sum of given array

PS G:\Codes\C0 102 Programs> 
```

EXPERIMENT 25

AIM: Write a C program to demonstrate the example of array of pointers.

CODE:

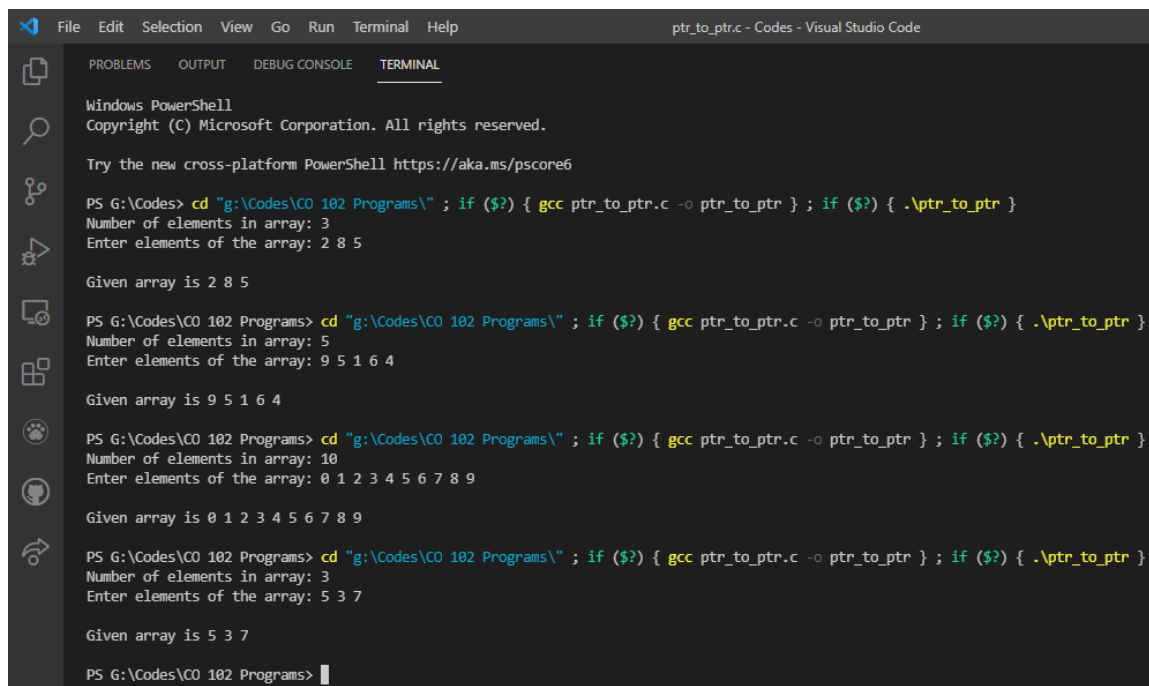
```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    int arr[100],n;
    printf("Number of elements in array: ");
    scanf("%d",&n);
    printf("Enter elements of the array: ");
    for(int i=0;i<n;++i){
        scanf("%d",arr+i);}

    int *ptr[100];
    for(int i=0;i<n;++i){
        ptr[i]=arr+i;}

    printf("\nGiven array is");
    for(int i=0;i<n;++i){
        printf(" %d",*ptr[i]);}
    printf("\n\n");
    return 0;
}
```

OUTPUT:



```
ptr_to_ptr.c - Codes - Visual Studio Code

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

Windows PowerShell
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PS G:\Codes> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc ptr_to_ptr.c -o ptr_to_ptr } ; if ($?) { .\ptr_to_ptr }
Number of elements in array: 3
Enter elements of the array: 2 8 5

Given array is 2 8 5

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc ptr_to_ptr.c -o ptr_to_ptr } ; if ($?) { .\ptr_to_ptr }
Number of elements in array: 5
Enter elements of the array: 9 5 1 6 4

Given array is 9 5 1 6 4

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc ptr_to_ptr.c -o ptr_to_ptr } ; if ($?) { .\ptr_to_ptr }
Number of elements in array: 10
Enter elements of the array: 0 1 2 3 4 5 6 7 8 9

Given array is 0 1 2 3 4 5 6 7 8 9

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc ptr_to_ptr.c -o ptr_to_ptr } ; if ($?) { .\ptr_to_ptr }
Number of elements in array: 3
Enter elements of the array: 5 3 7

Given array is 5 3 7

PS G:\Codes\CO 102 Programs> 
```

EXPERIMENT 26

AIM: Write a C program to find the length of the string without using strlen and then pass the string to characters.

CODE:

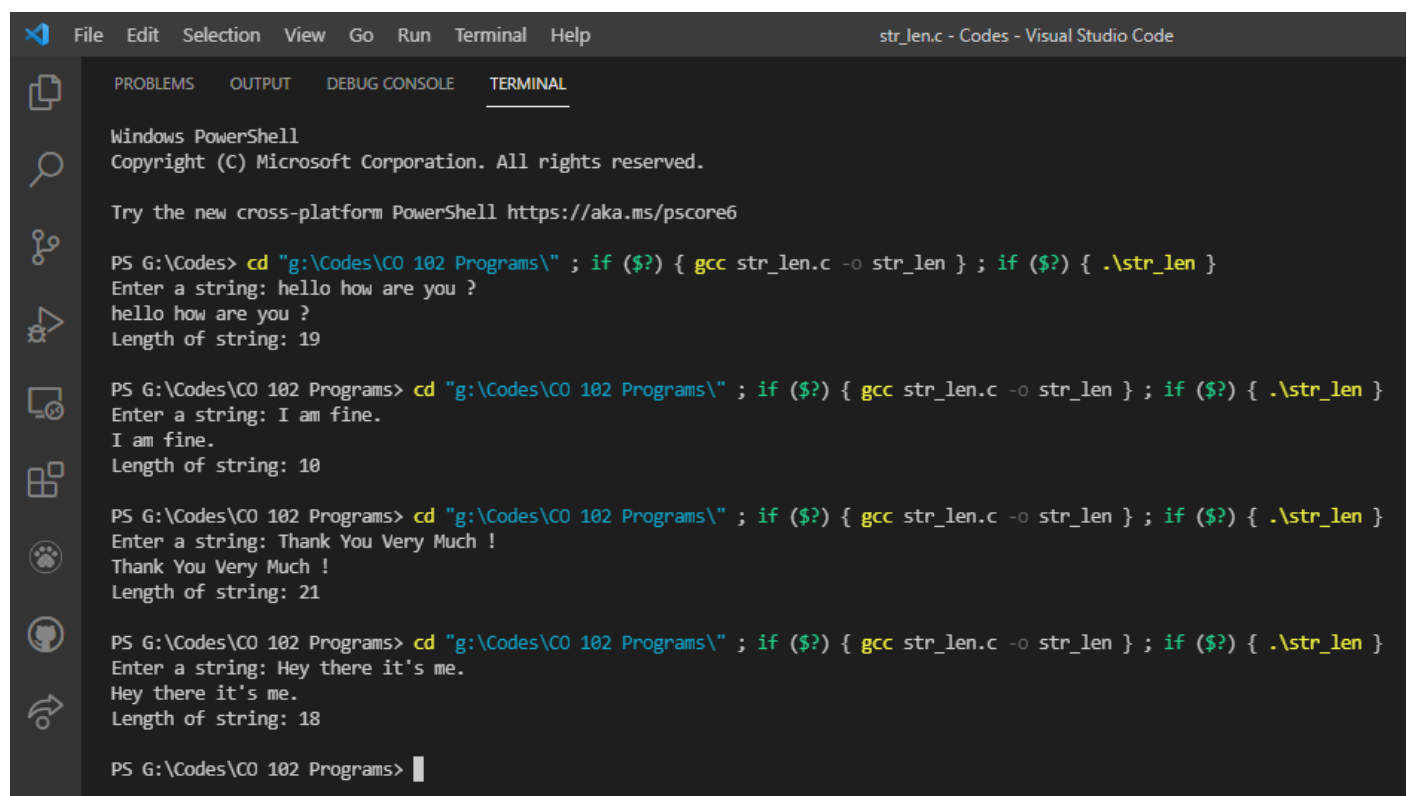
```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    char str[32];
    int count=0;
    printf("Enter a string: ");
    gets(str);

    while(str[count]!='\0')
        count++;

    puts(str);
    printf("Length of string: %d\n\n",count);
    return 0;
}
```

OUTPUT:

The screenshot shows the Visual Studio Code interface with the 'TERMINAL' tab active. The terminal window is titled 'str_len.c - Codes - Visual Studio Code'. It displays the output of the C program for four different inputs. The first input is 'hello how are you ?' with a length of 19. The second input is 'I am fine.' with a length of 10. The third input is 'Thank You Very Much !' with a length of 21. The fourth input is 'Hey there it's me.' with a length of 18. The terminal prompt is 'PS G:\Codes\CO 102 Programs>' and the command to run the program is 'gcc str_len.c -o str_len ; if (\$?) { .\str_len }'.

```
File Edit Selection View Go Run Terminal Help
str_len.c - Codes - Visual Studio Code

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Windows PowerShell
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PS G:\Codes> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc str_len.c -o str_len } ; if ($?) { .\str_len }
Enter a string: hello how are you ?
hello how are you ?
Length of string: 19

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc str_len.c -o str_len } ; if ($?) { .\str_len }
Enter a string: I am fine.
I am fine.
Length of string: 10

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc str_len.c -o str_len } ; if ($?) { .\str_len }
Enter a string: Thank You Very Much !
Thank You Very Much !
Length of string: 21

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc str_len.c -o str_len } ; if ($?) { .\str_len }
Enter a string: Hey there it's me.
Hey there it's me.
Length of string: 18

PS G:\Codes\CO 102 Programs>
```

EXPERIMENT 27

AIM: Write a C program to count the number of vowels in a given string.

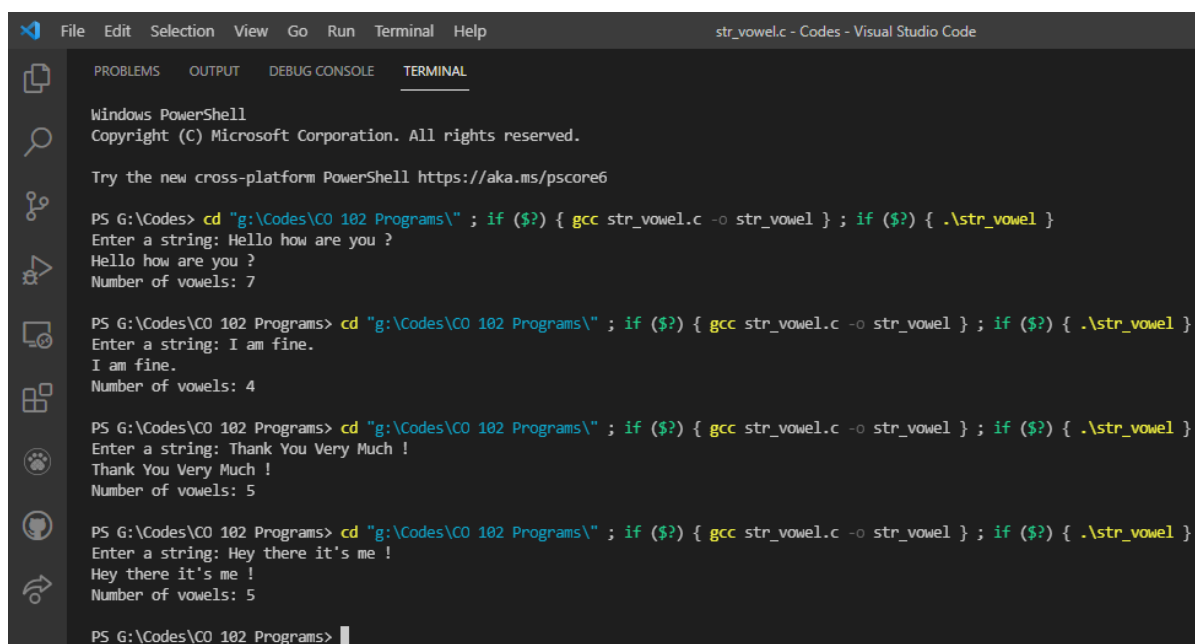
CODE:

```
// Aneesh Panchal
// 2K20/A6/56

#include<stdio.h>
int main()
{
    char str[100];
    int count=0,i=0;
    printf("Enter a string: ");
    gets(str);

    while(str[i]!='\0')
    {
        if(str[i]=='A' || str[i]=='E' || str[i]=='I' || str[i]=='O' || str[i]=='U' ||
           str[i]=='a' || str[i]=='e' || str[i]=='i' || str[i]=='o' || str[i]=='u')
        {
            ++count;
        }
        ++i;
    }
    puts(str);
    printf("Number of vowels: %d\n\n",count);
    return 0;
}
```

OUTPUT:

The screenshot shows the Visual Studio Code interface with the 'TERMINAL' tab active. The terminal window is titled 'str_vowel.c - Codes - Visual Studio Code'. It displays the output of the C program for four different input strings. The program prompts the user to 'Enter a string:' and then prints the 'Number of vowels'.

```
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PS G:\Codes> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc str_vowel.c -o str_vowel } ; if ($?) { .\str_vowel }
Enter a string: Hello how are you ?
Hello how are you ?
Number of vowels: 7

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc str_vowel.c -o str_vowel } ; if ($?) { .\str_vowel }
Enter a string: I am fine.
I am fine.
Number of vowels: 4

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc str_vowel.c -o str_vowel } ; if ($?) { .\str_vowel }
Enter a string: Thank You Very Much !
Thank You Very Much !
Number of vowels: 5

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc str_vowel.c -o str_vowel } ; if ($?) { .\str_vowel }
Enter a string: Hey there it's me !
Hey there it's me !
Number of vowels: 5

PS G:\Codes\C0 102 Programs> 
```

EXPERIMENT 28

AIM: Write a C program to check if a given string is a palindrome or not.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

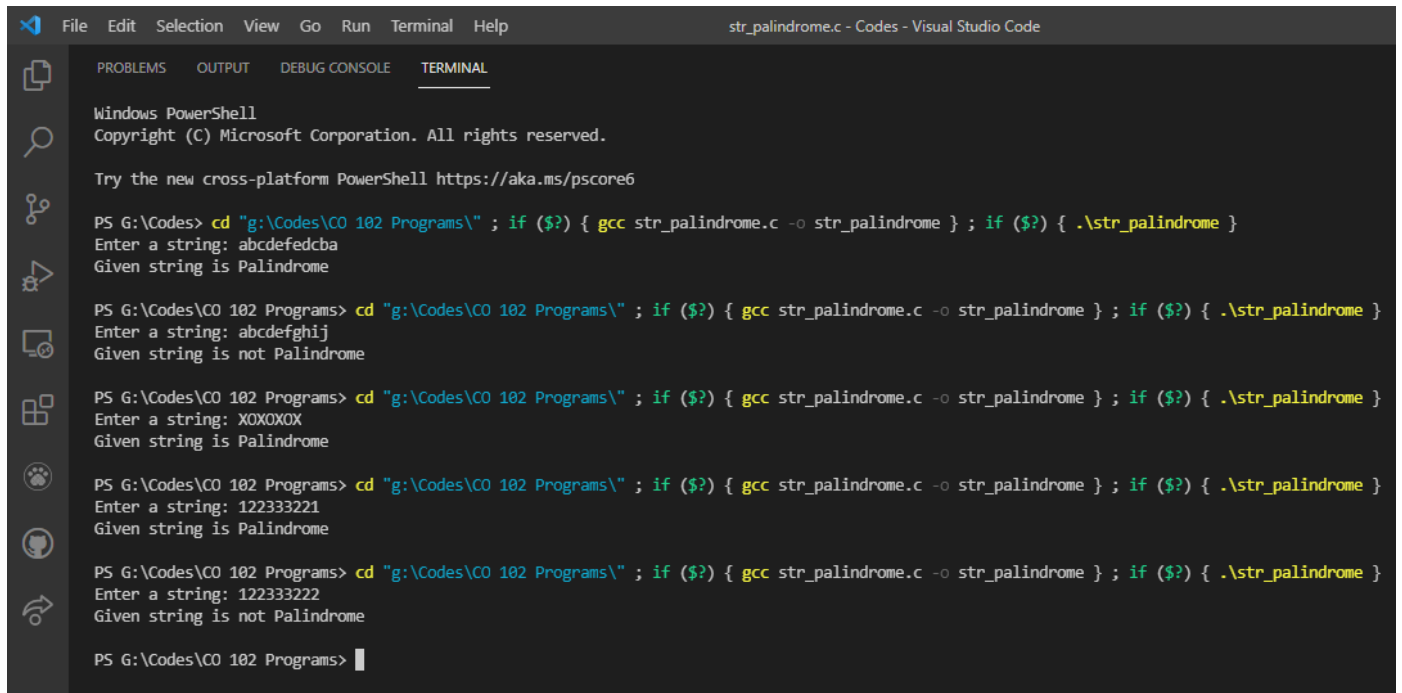
#include<stdio.h>
int main()
{
    char str[100];
    printf("Enter a string: ");
    gets(str);

    int count=1;
    int len=0;
    while(str[len]!='\0')
        ++len;

    for(int i=0;i<len;++i)
    {
        if(str[i]!=str[len-i-1])
        {
            count=0;
            break;
        }
    }

    if(count==0)
        printf("Given string is not Palindrome\n\n");
    else
        printf("Given string is Palindrome\n\n");
    return 0;
}
```

OUTPUT:



The screenshot shows a Visual Studio Code window with the file `str_palindrome.c` open. The terminal pane is active, displaying the output of a Windows PowerShell session. The user has navigated to the directory `G:\Codes\CO 102 Programs\` and compiled the program `str_palindrome.c` using `gcc`. They then executed the program multiple times, entering different strings to test the palindrome logic. The program correctly identifies "abcdefedcba", "XOXOXOX", and "122333221" as palindromes, and "abcdeefghij" and "122333222" as not palindromes.

```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS G:\Codes> cd "G:\Codes\CO 102 Programs\" ; if ($?) { gcc str_palindrome.c -o str_palindrome } ; if ($?) { .\str_palindrome }
Enter a string: abcdefedcba
Given string is Palindrome

PS G:\Codes\CO 102 Programs> cd "G:\Codes\CO 102 Programs\" ; if ($?) { gcc str_palindrome.c -o str_palindrome } ; if ($?) { .\str_palindrome }
Enter a string: abcdeefghij
Given string is not Palindrome

PS G:\Codes\CO 102 Programs> cd "G:\Codes\CO 102 Programs\" ; if ($?) { gcc str_palindrome.c -o str_palindrome } ; if ($?) { .\str_palindrome }
Enter a string: XOXOXOX
Given string is Palindrome

PS G:\Codes\CO 102 Programs> cd "G:\Codes\CO 102 Programs\" ; if ($?) { gcc str_palindrome.c -o str_palindrome } ; if ($?) { .\str_palindrome }
Enter a string: 122333221
Given string is Palindrome

PS G:\Codes\CO 102 Programs> cd "G:\Codes\CO 102 Programs\" ; if ($?) { gcc str_palindrome.c -o str_palindrome } ; if ($?) { .\str_palindrome }
Enter a string: 122333222
Given string is not Palindrome

PS G:\Codes\CO 102 Programs> |
```

EXPERIMENT 29

AIM: Write a C program to string concatenation.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

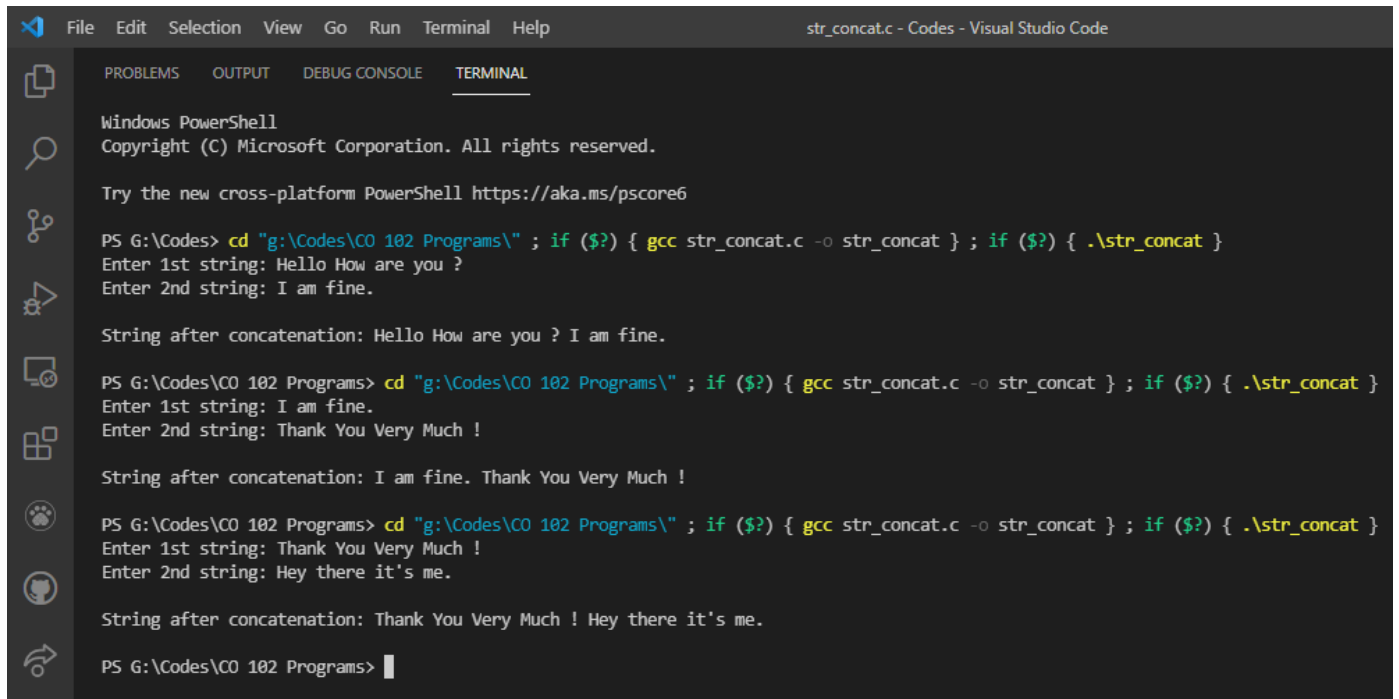
#include<stdio.h>
int main()
{
    char str1[100],str2[100];
    printf("Enter 1st string: ");
    gets(str1);
    printf("Enter 2nd string: ");
    gets(str2);

    int i=0,j=0;
    while(str1[i]!='\0')
        ++i;

    while(str2[j]!='\0')
    {
        str1[i]=str2[j];
        ++i;++j;
    }
    str1[i]='\0';

    printf("\nString after concatenation: ");
    puts(str1);
    printf("\n");
    return 0;
}
```


OUTPUT:



The screenshot shows the Visual Studio Code interface with the 'TERMINAL' tab active. The terminal window displays the output of a C program named 'str_concat.c'. The program prompts the user to enter two strings and then concatenates them. The output shows three separate runs of the program with different inputs.

```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS G:\Codes> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc str_concat.c -o str_concat } ; if ($?) { .\str_concat }
Enter 1st string: Hello How are you ?
Enter 2nd string: I am fine.

String after concatenation: Hello How are you ? I am fine.

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc str_concat.c -o str_concat } ; if ($?) { .\str_concat }
Enter 1st string: I am fine.
Enter 2nd string: Thank You Very Much !

String after concatenation: I am fine. Thank You Very Much !

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc str_concat.c -o str_concat } ; if ($?) { .\str_concat }
Enter 1st string: Thank You Very Much !
Enter 2nd string: Hey there it's me.

String after concatenation: Thank You Very Much ! Hey there it's me.

PS G:\Codes\C0 102 Programs> 
```

EXPERIMENT 30

AIM: Write a C program to string comparison.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

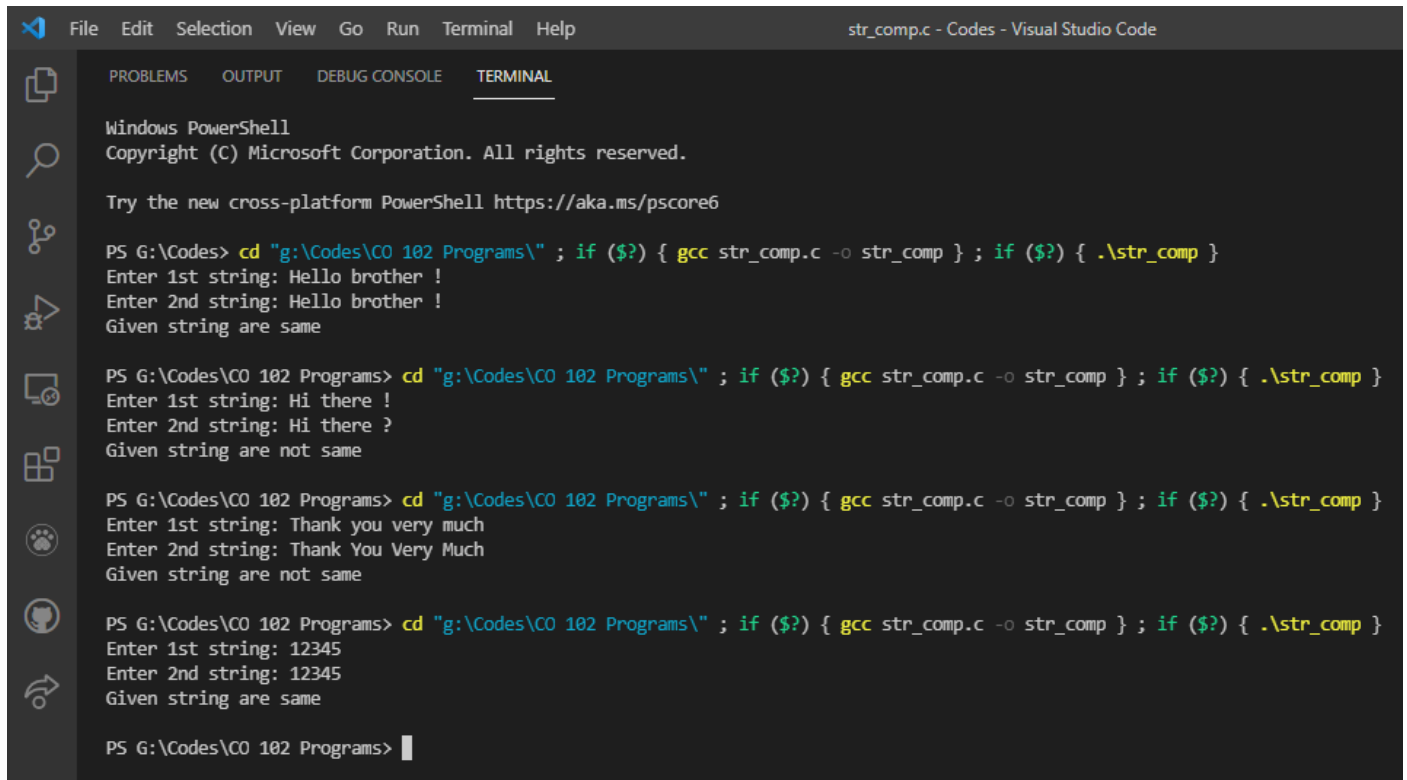
#include<stdio.h>
int main()
{
    char str1[100],str2[100];
    printf("Enter 1st string: ");
    gets(str1);
    printf("Enter 2nd string: ");
    gets(str2);
    int count=1,len=0;

    int len1=0,len2=0;
    while(str1[len1]!='\0')
        ++len1;
    while(str2[len2]!='\0')
        ++len2;

    if(len1==len2){len=len1;}
    else if(len1>len2){len=len1;}
    else{len=len2;}

    for(int i=0;i<len;++i)
    {
        if(str1[i]!=str2[i])
        {
            count=0;
            break;
        }
    }
    if(count==0)
        printf("Given string are not same\n\n");
    else
        printf("Given string are same\n\n");
    return 0;
}
```

OUTPUT:



The screenshot shows the Visual Studio Code interface with the 'TERMINAL' tab active. The terminal window displays the output of a C program that compares two strings. The program is located at 'g:\Codes\CO 102 Programs\' and is named 'str_comp.c'. The user has compiled the program using 'gcc' and is now running it. The program prompts the user to enter two strings and then compares them. The output shows three test cases: 1) 'Hello brother !' and 'Hello brother !' are the same. 2) 'Hi there !' and 'Hi there ?' are not the same. 3) 'Thank you very much' and 'Thank You Very Much' are not the same. The terminal also shows the command prompt 'PS G:\Codes\CO 102 Programs>' and the file explorer on the left side of the Visual Studio Code window.

```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS G:\Codes> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc str_comp.c -o str_comp } ; if ($?) { .\str_comp }
Enter 1st string: Hello brother !
Enter 2nd string: Hello brother !
Given string are same

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc str_comp.c -o str_comp } ; if ($?) { .\str_comp }
Enter 1st string: Hi there !
Enter 2nd string: Hi there ?
Given string are not same

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc str_comp.c -o str_comp } ; if ($?) { .\str_comp }
Enter 1st string: Thank you very much
Enter 2nd string: Thank You Very Much
Given string are not same

PS G:\Codes\CO 102 Programs> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc str_comp.c -o str_comp } ; if ($?) { .\str_comp }
Enter 1st string: 12345
Enter 2nd string: 12345
Given string are same

PS G:\Codes\CO 102 Programs>
```

EXPERIMENT 31

AIM: Write a C program to string reverse.

CODE:

```
// Aneesh Panchal
// 2K20/A6/56

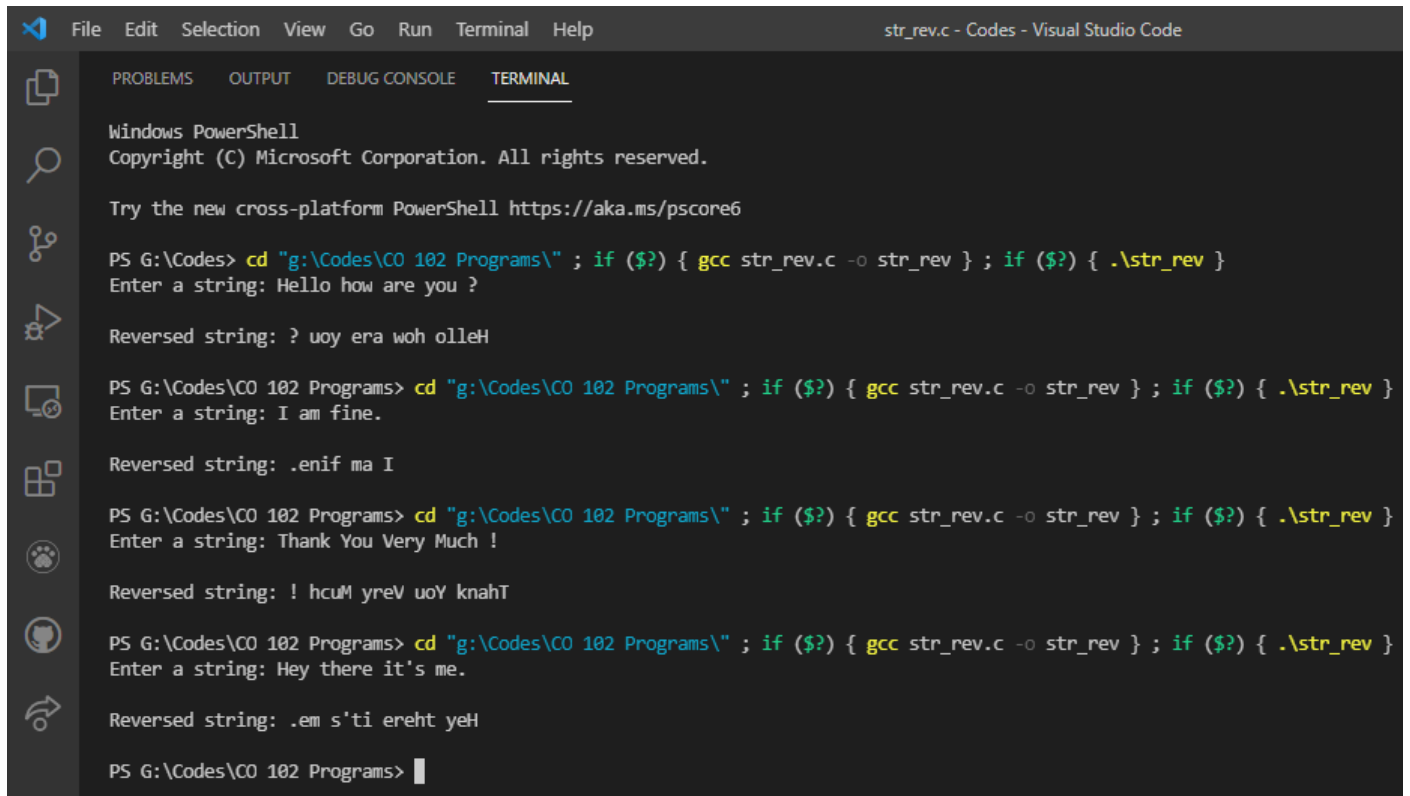
#include<stdio.h>
int main()
{
    char str[100];
    printf("Enter a string: ");
    gets(str);

    int len=0;
    char temp;
    while(str[len]!='\0')
        ++len;

    for(int i=0;i<len/2;++i)
    {
        temp=str[i];
        str[i]=str[len-i-1];
        str[len-i-1]=temp;
    }

    printf("\nReversed string: ");
    puts(str);
    printf("\n");
    return 0;
}
```

OUTPUT:



```
str_rev.c - Codes - Visual Studio Code

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS G:\Codes> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc str_rev.c -o str_rev } ; if ($?) { .\str_rev }
Enter a string: Hello how are you ?

Reversed string: ? uoy era woh olleH

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc str_rev.c -o str_rev } ; if ($?) { .\str_rev }
Enter a string: I am fine.

Reversed string: .enif ma I

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc str_rev.c -o str_rev } ; if ($?) { .\str_rev }
Enter a string: Thank You Very Much !

Reversed string: ! hcuM yreV uoY knahT

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc str_rev.c -o str_rev } ; if ($?) { .\str_rev }
Enter a string: Hey there it's me.

Reversed string: .em s'ti ereht yeH

PS G:\Codes\C0 102 Programs> 
```

EXPERIMENT 32

AIM: Write a C program to convert a string from lower case to upper case and vice versa.

CODE:

```
//Aneesh Panchal
//2K20/A6/56

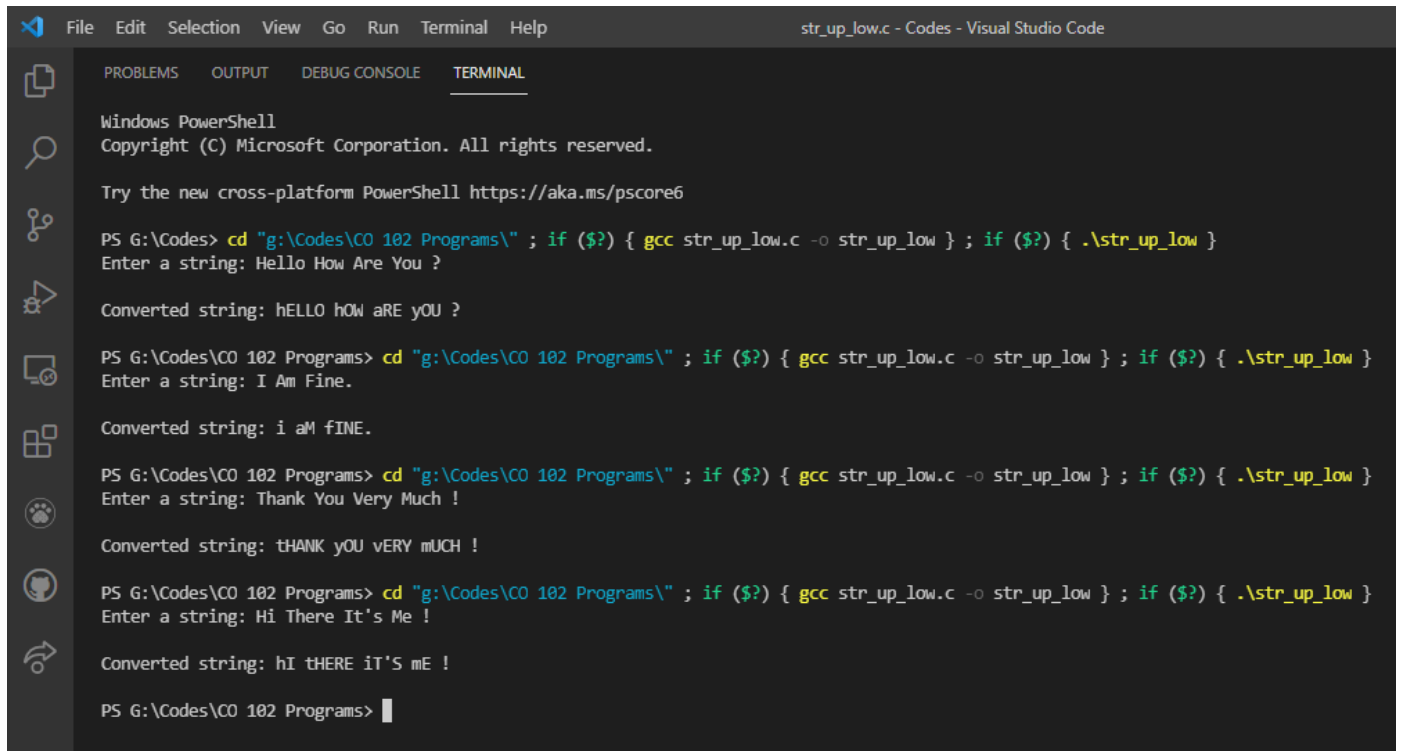
#include<stdio.h>
int main()
{
    char str[100];
    printf("Enter a string: ");
    gets(str);

    int len=0;
    while(str[len]!='\0')
        ++len;

    for(int i=0;i<len;++i)
    {
        if(str[i]>=65 && str[i]<=90)
            str[i]=str[i]+32;
        else if(str[i]>=97 && str[i]<=122)
            str[i]=str[i]-32;
    }
    printf("\nConverted string: ");
    puts(str);
    printf("\n");

    return 0;
}
```

OUTPUT:



The screenshot shows the Visual Studio Code interface with the 'TERMINAL' tab active. The terminal window displays the output of a PowerShell script that runs a C program named 'str_up_low.c'. The script prompts the user to enter a string, and the program converts it to both uppercase and lowercase. The input strings and their corresponding outputs are as follows:

```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS G:\Codes> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc str_up_low.c -o str_up_low } ; if ($?) { .\str_up_low }
Enter a string: Hello How Are You ?

Converted string: HELLO hOW aRE yOU ?

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc str_up_low.c -o str_up_low } ; if ($?) { .\str_up_low }
Enter a string: I Am Fine.

Converted string: i aM fINE.

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc str_up_low.c -o str_up_low } ; if ($?) { .\str_up_low }
Enter a string: Thank You Very Much !

Converted string: tHANK yOU vERY mUCH !

PS G:\Codes\C0 102 Programs> cd "g:\Codes\C0 102 Programs\" ; if ($?) { gcc str_up_low.c -o str_up_low } ; if ($?) { .\str_up_low }
Enter a string: Hi There It's Me !

Converted string: hI tHERE iT'S mE !

PS G:\Codes\C0 102 Programs> 
```

EXPERIMENT 33

AIM: Write a C program to generate the employee details using structure.

CODE:

```
//Aneesh Panchal
//2K20/A6/56

#include<stdio.h>
typedef struct
{
    char name[100];
    int age;
    int salary;
}
employee;

int main()
{
    employee emp[100];
    int n;
    printf("Enter number of employees: ");
    scanf("%d",&n);

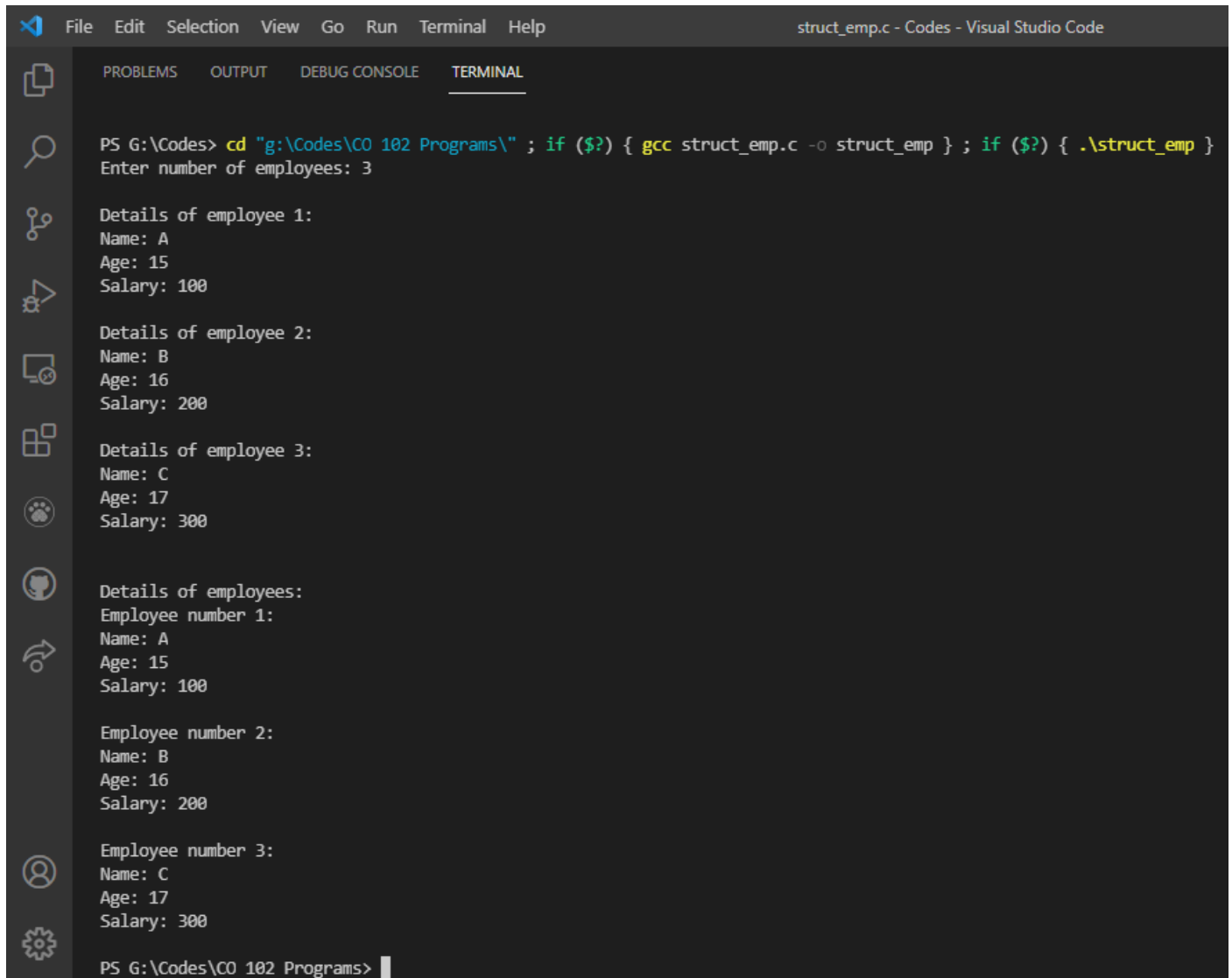
    for(int i=0;i<n;++i)
    {
        printf("\nDetails of employee %d:\n",i+1);
        printf("Name: ");
        scanf("%s",emp[i].name);

        printf("Age: ");
        scanf("%d",&emp[i].age);

        printf("Salary: ");
        scanf("%d",&emp[i].salary);
    }

    printf("\n\nDetails of employees:\n");
    for(int i=0;i<n;++i)
    {
        printf("Employee number %d:\n",i+1);
        printf("Name: %s\n",emp[i].name);
        printf("Age: %d\n",emp[i].age);
        printf("Salary: %d\n\n",emp[i].salary);
    }
    return 0;
}
```


OUTPUT:



```
struct_emp.c - Codes - Visual Studio Code

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

PS G:\Codes> cd "g:\Codes\CO 102 Programs\" ; if ($?) { gcc struct_emp.c -o struct_emp } ; if ($?) { .\struct_emp }
Enter number of employees: 3

Details of employee 1:
Name: A
Age: 15
Salary: 100

Details of employee 2:
Name: B
Age: 16
Salary: 200

Details of employee 3:
Name: C
Age: 17
Salary: 300

Details of employees:
Employee number 1:
Name: A
Age: 15
Salary: 100

Employee number 2:
Name: B
Age: 16
Salary: 200

Employee number 3:
Name: C
Age: 17
Salary: 300

PS G:\Codes\CO 102 Programs>
```