Prasanna Dhungana
21053439
A-28

LAB Assignment 7

1. Write a C Program to check whether an input integer is a perfect number or not. Note that, in number theory, a perfect number is a positive integer that is equal to the sum of its positive divisors, excluding the number itself.

Program:-

```c
#include <stdio.h>

int main() {
    int num3439  , count3439 , sum3439 =1;
    printf("\n\nEnter any number :");
    scanf("%d",&num3439);
    for (count3439 =2 ; count3439< num3439 ; count3439++ ){
        if (num3439%count3439 ==0){
            sum3439 +=count3439;
        }
    }
    if (sum3439 == num3439){
        printf("%d is a perfect number.\n",num3439);
    }
    else{
    printf("%d is not a perfect number.\n",num3439);
    }
    return 0;
}
```

Output:-

```
Enter any number :28
28 is a perfect number.

PS C:\Users\Prasanna Dhungana\OneDrive\Deskt
7\" ; if ($?) { gcc Perfect.c -o Perfect } ;


Enter any number :9
9 is not a perfect number.

PS C:\Users\Prasanna Dhungana\OneDrive\Deskt
```

2. Write a C Program to calculate the sum of digits of a given integer number.

Program:

```
#include<stdio.h>
int main(){
    int num3439, sum3439 = 0 , iter3439;
    printf("\n\nEnter a integer to get the sum of its digit : ");
    scanf("%d", &num3439);
    iter3439 =num3439;
    while (iter3439 != 0){
    sum3439 +=(iter3439%10);
    iter3439 /=10;
    }
    printf("Sum of the digits in the number %d is %d .\n\n", num3439 ,
sum3439);
    return 0;
}
```

Output:

```
Enter a integer to get the sum of its digit : 25
Sum of the digits in the number 25 is 7 .

PS C:\Users\Prasanna Dhungana\OneDrive\Desktop\2nd sem\
cc LA7_2_SumOfDigits.c -o LA7_2_SumOfDigits } ; if ($?)


Enter a integer to get the sum of its digit : 2365
Sum of the digits in the number 2365 is 16 .
```

3. Write a C Program to find the GCD/HCF of two numbers.

Program:

```c
#include<stdio.h>
    int main(){
        int i3439 , j3439 , num13439, num23439 ,temp3439, hcf3439=0;
        printf("\n\nEnter any two integers to find hcf :\n");
        scanf("%d %d",&num13439,&num23439);
        if (num13439>num23439){
            temp3439 = num23439;
        }
        else{
            temp3439 = num23439;
        }
        for(i3439 = 1 ; i3439 < temp3439 ; i3439++){
            if ((num13439 % i3439 == 0) && (num23439 % i3439 == 0)){
                hcf3439 =i3439;
            }
        }
        printf("the GCD/HCF of the two numbers is : %d \n\n",hcf3439 );
    return 0;
    }
```

Output:-

```
cc LA7_3_HcfGcd.c -o LA7_3_HcfGcd } ; if ($?) { .\L
Enter any two integers to find hcf :
12
18
the GCD/HCF of the two numbers is : 6

PS C:\Users\Prasanna Dhungana\OneDrive\Desktop\2nd
cc LA7_3_HcfGcd.c -o LA7_3_HcfGcd } ; if ($?) { .\L


Enter any two integers to find hcf :
25
20
the GCD/HCF of the two numbers is : 5

PS C:\Users\Prasanna Dhungana\OneDrive\Desktop\2nd
```

4. Write a C Program to calculate the factorial of a given number.

Program:-

```
#include<stdio.h>
    int main(){
        int num3439, factorial3439 = 1 , iter3439;
        printf("\n\nEnter a number to get the factorial : ");
        scanf("%d", &num3439);
        iter3439 = num3439;
        if (num3439 ==0){
            factorial3439 = 1;
            printf("factorial of the number %d is %d\n\n", num3439 ,
factorial3439);
        }
        else if (num3439 >0){
            while (iter3439 != 0){
            factorial3439 *=iter3439;
            iter3439 -=1;
        }
        printf("factorial of the number %d is %d\n\n", num3439 ,
factorial3439);
        }
        else{
        printf("Invalid Input!");
        }
    return 0;
    }
```

Output:-

```
cc LA7_4_factorial.c -o LA7_4_factorial } ; if


Enter a number to get the factorial : 5
factorial of the number 5 is 120

PS C:\Users\Prasanna Dhungana\OneDrive\Desktop
cc LA7_4_factorial.c -o LA7_4_factorial } ; if


Enter a number to get the factorial : 12
factorial of the number 12 is 479001600

PS C:\Users\Prasanna Dhungana\OneDrive\Desktop
```

5. Write a C Program to check whether an input integer is strong number or not. Note that, if the sum of factorials of all the digits of a number are equal to the number, the number is called a strong number.

Program:-

```
#include<stdio.h>
    int main(){
        int num3439,num23439, factorial3439 = 1 , iter3439 ,sum3439=0;
        printf("\n\nEnter a number : ");
        scanf("%d", &num3439);
        num23439 = num3439;
          while (num23439!=0){
            iter3439 = (num23439%10);
            num23439 /= 10;
            while (iter3439 != 0){
              factorial3439 *=iter3439;
              iter3439 -=1;
            }
            sum3439 +=factorial3439;
            factorial3439 =1;
            }
          if (sum3439 == num3439){
        printf("%d is a strong number.\n\n", num3439);
        }
        else{
        printf("%d is not a strong number.\n\n", num3439);
        }
    return 0;
    }
```

Output:

```
cc LA7_5_strongNumber.c -o LA7


Enter a number : 145
145 is a strong number.

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cc LA7_5_strongNumber.c -o LA7


Enter a number : 25
25 is not a strong number.

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```

6. Write a C Program to print the following pattern for n rows. Ex. for n=5 rows:

A
B A
C B A
D C B A
E D C B A

Program:

```
#include<stdio.h>
    int main(){
        int numrows3439 , numcol3439,num3439 ;
        char asc = 64;
        printf("Enter now of rows: ");
        scanf("%d",&num3439);
        for (numrows3439 =1 ;numrows3439 <= num3439 ; numrows3439++ ){
          asc +=numrows3439;
          for (numcol3439 = numrows3439 ; numcol3439>0 ; numcol3439--){
          printf("%c ",asc);
          asc -=1;
        }
          printf("\n");
          }
      printf("\n");
    return 0;
    }
```

Output:-

```
_6_pattern.c -o LAZ_6_p
Enter now of rows: 5
A
B A
C B A
D C B A
E D C B A

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```

7. Write a C Program to print the following pattern for n rows. Ex. for n=5 rows:

1
2 1
1 2 3
4 3 2 1
1 2 3 4 5

Program:-

```
#include<stdio.h>
    int main(){
        int numrows3439 , numcol3439,num3439 ;
        printf("Enter now of rows: ");
        scanf("%d",&num3439);
        for (numrows3439 =1 ;numrows3439 <= num3439 ; numrows3439++ ){
            if (numrows3439%2==0){
                for (numcol3439= numrows3439; numcol3439>0;numcol3439--){
                printf("%d ",numcol3439);
            }
            }
            else{
                for (numcol3439= 1; numcol3439<=numrows3439;numcol3439++){
                printf("%d ",numcol3439);
                }
            }
          printf("\n");
          }
      printf("\n");
    return 0;
    }
```

Output:-

```
cc LA7_7_numPattern.c
Enter now of rows: 5
1
2 1
1 2 3
4 3 2 1
1 2 3 4 5

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```

8. Write a C Program to form reverse pyramid of numbers for a given number as follows. Ex. for number n=4:

1 2 3 4 3 2 1
1 2 3 2 1
1 2 1
1

Program:-

```
#include<stdio.h>
    int main(){
        int numrows3439 , numcol13439,numcol23439,num3439,spac3439 ;
        printf("Enter now of rows: ");
        scanf("%d",&num3439);
        for (numrows3439 =num3439 ;numrows3439 >0 ; numrows3439-- ){
            for (spac3439=(num3439-numrows3439); spac3439>0; spac3439--){
                printf("  ");
            }
                for (numcol13439= 1;
numcol13439<=numrows3439;numcol13439++){
                printf("%d ",numcol13439);
                }
                for (numcol23439= (numrows3439-1);
numcol23439>=1;numcol23439--){
                printf("%d ",numcol23439);
                }
          printf("\n");
          }
      printf("\n");
    return 0;
    }
```

Output:-

```
cc LA7_8_ReversePyramid
Enter now of rows: 5
1 2 3 4 5 4 3 2 1
  1 2 3 4 3 2 1
    1 2 3 2 1
      1 2 1
        1

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```

9. Write a C Program to form Pascal Triangle pyramid of numbers for a given number. The Pascal Triangle is a triangular arrangement of numbers that gives the coefficients in the expansion of a binomial expression (x + y) n . Ex. for number n = 6, the triangle would appear as follows:

```
            1
          1  1
        1  2  1
      1  3  3  1
    1  4  6  4  1
  1  5  10  10  5  1
1  6  15  20  15  6  1
```

Program:-

```
#include <stdio.h>

int main(){
    int rows3439 ,n3439, r3439 , space3439 , c3439=1 ;
    printf("Enter the number of rows of pascal triangle to be displayed
:");
    scanf("%d",&rows3439);
    for (n3439 = 1 ; n3439<=rows3439 ; n3439++){
        c3439=1;
        for (space3439 = (rows3439-n3439); space3439 >=1; space3439--){
            printf(" ");
        }
        for (r3439 =1 ; r3439<=n3439 ; r3439++){
            printf("%d ",c3439);
            c3439 = (c3439*(n3439-r3439)) /r3439 ;
        }
        printf("\n");
    }
}
```

Output:-

```
cc LA7_9_Pascaltrig.c -o LA7_9_Pascaltrig } ; if ($?) { .\LA7_9_Pasca
Enter the number of rows of pascal triangle to be displayed :7
      1
    1 1
   1 2 1
  1 3 3 1
 1 4 6 4 1
1 5 10 10 5 1
1 6 15 20 15 6 1
PS C:\Users\Prasanna Dhungana\OneDrive\Desktop\2nd sem\21053439_A28\L
```

10. Write a C Program to create an array that can store max. 50 integers and display the contents of that array.

Program:-

```c
#include<stdio.h>
    int main(){
        int i3439 , j3439 ;
        int arr3439[50];
        printf("\n\nTo store and print 50 integers from array.\n\n");
        for ( i3439 =0 ; i3439 < 50 ; i3439++){
            arr3439[i3439] = (i3439 + 51);
        }
        for ( j3439 = 0 ; j3439 < 50 ; j3439++){
            printf("Element %d is : %d\n",(j3439 + 1), arr3439[j3439]);
        }
    return 0;
    }
```

Output:-

```
To store and print 50 integers from array.

Element 1 is : 51
Element 2 is : 52
Element 3 is : 53
Element 4 is : 54
Element 5 is : 55
Element 6 is : 56
Element 31 is : 81
Element 32 is : 82
Element 33 is : 83
Element 34 is : 84
Element 35 is : 85
Element 36 is : 86
Element 37 is : 87
Element 38 is : 88
Element 39 is : 89
Element 40 is : 90
Element 41 is : 91
Element 42 is : 92
Element 43 is : 93
Element 44 is : 94
Element 45 is : 95
Element 46 is : 96
Element 47 is : 97
Element 48 is : 98
Element 49 is : 99
Element 50 is : 100
PS C:\Users\Prasanna Dhungana\OneDrive\Desk
```

11. Write a C Program to find largest element stored in an array.

Program:-

```c
#include<stdio.h>
    int main(){
        int i3439 , j3439 , num3439 ,larg3439 = 0;
        printf("\n\nEnter the number of integers to be added in array: ");
        scanf("%d",&num3439);
        int arr3439[num3439];
        printf("Enter any %d integers:\n", num3439);
        for ( i3439 =0 ; i3439 < num3439 ; i3439++){
            scanf("%d", &arr3439[i3439]);
        }
        for ( j3439 = 0 ; j3439 < num3439 ; j3439++){
            if (arr3439[j3439]>larg3439){
                larg3439 = arr3439[j3439];
            }
        }
        printf("The largest of %d numbers is : %d\n",num3439 , larg3439);
    return 0;
    }
```

Output:-

```
Enter the number of integers to be added in array: 5
Enter any 5 integers:
1
55
86
99
25
The largest of 5 numbers is : 99
PS C:\Users\Prasanna Dhungana\OneDrive\Desktop\2nd sem
```

12. Write a C Program to find out the sum of the numbers stored in an array of integers.

Program:-

```c
#include<stdio.h>
    int main(){
        int i3439 , j3439,num3439 , sum3439=0 ;
        printf("\n\nEnter the number of integers to be added: ");
        scanf("%d",&num3439);
        int arr3439[num3439];
        printf("Enter any %d integers:", num3439);
        for ( i3439 =0 ; i3439 < num3439 ; i3439++){
            scanf("%d", &arr3439[i3439]);
        }
        for ( j3439 = 0 ; j3439 < num3439 ; j3439++){
            sum3439 += arr3439[j3439];
        }
        printf("The sum of %d numbers is : %d\n\n",num3439 , sum3439);
    return 0;
    }
```

Output:-

```
Enter the number of integers to be added: 5
Enter any 5 integers:6
8
2
4
5
The sum of 5 numbers is : 25

PS C:\Users\Prasanna Dhungana\OneDrive\Desktop
```