Green University of Bangladesh
Department of Computer Science and Engineering(CSE)

Faculty of Sciences and Engineering

Semester: (Summer, Year:2022), B.Sc. in CSE (Day)

LAB REPORT NO :06

Course Title: Structured Programming Lab

Course Code: CSE 104 Section: DE

Student Details

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Submission Date : 14-Sep-22

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[For Teachers use only: Don't Write Anything inside this box]

Lab Report Status

Marks: …… **Signature:.....**

Comments:..... **Date:.....**

Problem 01: Write a C Program to Calculate mean, median and Standard Deviation.

Code:

```c
#include <stdio.h>
#include <stdlib.h>
#include <math.h>
int main()
   {
        float *poi, mean = 0, median, sd, var;
        int n, i, j, temp;
        printf("Enter the size of elements:");
        scanf("%d", &n);
        poi   = (float *)malloc(sizeof (float) * n);

        printf("Enter elements:\n");
        for (i = 0; i < n; i++)
                scanf("%f", &poi[i]);
        for (i = 0; i < n; i++)
                mean = mean + poi[i];
        mean = mean / n;
        for (i = 0; i < n; i++)
        var = var + pow((poi[i] - mean) , 2);
        var = var / n;
        sd  = sqrt(var);
        for (i = 0; i < n - 1; i++)
                for (j = i; j < n; j++) {
                        if (poi[i] > poi[j]) {
                                temp = poi[i];
                                poi[i] = poi[j];
                                poi[j] = temp;
                        }
                }

        if ((n + 1) % 2 == 0) {
                median = poi[((n + 1) / 2) - 1];
        } else {
                median = (poi[((n + 1) / 2) - 1] + poi[((n + 2) / 2) - 1]) / 2;
        }
        printf("Standard deviation: %f\n", sd);
        printf("Mean : %f\n", mean);
        printf("Median: %f\n", median);
        return 0;
   }
```

Output:

```
Enter the size of elements:3
Enter elements:
7
8
9
Standard deviation: 0.816497
Mean : 8.000000
Median: 8.000000

Process returned 0 (0x0)   execution time : 4.705 s
Press any key to continue.
```

Problem 02: Write a C program to convert Decimal to Binary number system.

Code:

```c
#include <stdio.h>
#include <math.h>
long dectobin(int dec)
{
    long bin = 0;
    int rem, temp = 1;
    while (dec!=0)
    {
        rem = dec%2;
        dec = dec / 2;
        bin = bin + rem*temp;
        temp = temp * 10;
    }
    return bin;
}

int main()
{
    int dec;
    printf("Enter a Decimal Number to convert binary number: ");
    scanf("%d", &dec);
    printf("In Binary Number : %ld", dectobin(dec));
    return 0;
}
```

Output:

```
Enter a Decimal Number to convert binary number: 10
In Binary Number : 1010
Process returned 0 (0x0)   execution time : 1.049 s
Press any key to continue.
```

Problem 03: Write a c program to count frequency of each element in an array

Code:

```c
#include <stdio.h>
int main()
{
    int arr1[100], arr2[100];
    int n, i, j, ctr;
    printf("Enter the size of array :");
    scanf("%d",&n);
    printf("Enter the elements:\n",n);
    for(i=0;i<n;i++)
    {
        scanf("%d",&arr1[i]);
        arr2[i] = -1;
    }
    for(i=0; i<n; i++)
    {
        ctr = 1;
        for(j=i+1; j<n; j++)
        {
            if(arr1[i]==arr1[j])
            {
                ctr++;
                arr2[j] = 0;
            }
        }

        if(arr2[i]!=0)
        {
            arr2[i] = ctr;
        }
    }
    printf("\nThe frequency of all elements of array : \n");
    for(i=0; i<n; i++)
    {
        if(arr2[i]!=0)
        {
            printf("%d occurs %d times\n", arr1[i], arr2[i]);
        }
    }
}
```

Output:

```
Enter the size of array :5
Enter the elements:
1
1
6
4
4

The frequency of all elements of array :
1 occurs 2 times
6 occurs 1 times
4 occurs 2 times

Process returned 0 (0x0)   execution time : 10.125 s
Press any key to continue.
```

Problem 04: Write a program in C to find transpose of a given matrix.

Code:

```c
#include<stdio.h>
int main()
{
    int a[30][30],i,j,r,c,b[30][30];
    printf("Enter the matrix row and columns:\n");
    scanf("%d%d",&r,&c);
    for (i=0;i<r;i++)
    {
        for(j=0;j<c;j++)
        {
            printf("Enter elements for (%d x %d):",i,j);
            scanf("%d",&a[i][j]);
        }
    }
    printf("Entered matrix is \n");
    for(i=0;i<r;i++)
    {
        for(j=0;j<c;j++)
        {
            printf("%4d",a[i][j]);
        }
        printf("\n");
    }

    printf("The Transpose matrix:\n");
    for(i=0;i<r;i++)
    {
        for(j=0;j<c;j++)
                    b[j][i]=a[i][j];
    }
    for(j=0;j<r;j++)
    {
        for(i=0;i<c;i++)
        {
            printf("%4d",b[j][i]);
        }
         printf("\n");
     }

     return 0;
}
```

Output:

```
Enter the matrix row and columns:
2
2
Enter elements for (0 x 0):1
Enter elements for (0 x 1):2
Enter elements for (1 x 0):3
Enter elements for (1 x 1):4
Entered matrix is
   1   2
   3   4
The Transpose matrix:
   1   3
   2   4

Process returned 0 (0x0)   execution time : 9.110 s
Press any key to continue.
```