DAY-2 (Data-Structures) Lab Session

EXP - 1

TITLE : C Program to Initialize an Array Dynamically

PROGRAM :

```
#include <stdio.h>
int main()
{
        int i,b;
        printf("Enter The Size of the Array:");
        scanf("%d",&b);
        int a[b];
        for(i=0;i<b;i++)
        {
                printf("Enter Element-%d:",i+1);
                scanf("%d",&a[i]);
        }
        printf("The Initialized Array:\n{ ");
        for(i=0;i<b;i++)
        {
                printf("%d ",a[i]);
        }
        printf("}");
}
```

INPUT AND OUTPUT :

```
Enter The Size of the Array:5
Enter Element-1:1
Enter Element-2:2
Enter Element-3:3
Enter Element-4:4
Enter Element-5:5
The Initialized Array:
{ 1 2 3 4 5 }20
```

RESULT :

The C Program for Initializing an Array Dynamically is Compiled and Executed Using Dev-C++ and the Output is Verified.

DAY-2 (Data-Structures) Lab Session

EXP - 2

TITLE : C Program to Find the Sum of Elements in the Given Array

PROGRAM :

```
#include <stdio.h>
int main()
{
        int a[100],i,b,sum=0;
        printf("Enter The Size of the Array:");
        scanf("%d",&b);
        for(i=0;i<b;i++)
        {
                printf("Enter Element-%d:",i+1);
                scanf("%d",&a[i]);
        }
        for(i=0;i<b;i++)
        {
                sum=sum+a[i];
        }
        printf("The Sum of Elements in an Array
is:%d",sum);
}
```

INPUT AND OUTPUT :

```
Enter The Size of the Array:5
Enter Element-1:1
Enter Element-2:2
Enter Element-3:3
Enter Element-4:4
Enter Element-5:5
The Sum of Elements in an Array is:15
```

RESULT :

The C Program for Finding the sum of Elements in an Array is Compiled and Executed Using Dev-C++ and the Output is Verified.

DAY-2 (Data-Structures) Lab Session

EXP - 3

TITLE : C Program to Find the Sum of Even and Odd Elements in the Given Array.

PROGRAM :

```
#include <stdio.h>
int main()
{
        int a[100],i,b,esum=0,osum=0;
        printf("Enter The Size of the Array:");
        scanf("%d",&b);
        for(i=0;i<b;i++)
        {
                printf("Enter Element-%d:",i+1);
                scanf("%d",&a[i]);
        }
        for(i=0;i<b;i++)
        {
                if(a[i]%2==0)
                {
                        esum=esum+a[i];
                }
                else
                {
                        osum+=a[i];
                }
        }
        printf("The Sum of Even Elements in an Array is:%d\n",esum);
        printf("The Sum of Odd Elements in an Array is:%d",osum);}
```

INPUT AND OUTPUT :

```
Enter The Size of the Array:5
Enter Element-1:1
Enter Element-2:2
Enter Element-3:3
Enter Element-4:4
Enter Element-5:5
The Sum of Even Elements in an Array is:6
The Sum of Odd Elements in an Array is:9
```

RESULT :

The C Program for Finding the sum of Odd and Even Elements in an Array is Compiled and Executed Using Dev-C++ and the Output is Verified.

DAY-2 (Data-Structures) Lab Session

EXP - 4

TITLE : C Program to Perform Insertion and Deletion in an Array

PROGRAM :

```
#include <stdio.h>
#include <string.h>
int main()
{
        int a[100],i,j,t1,t2,b,c,e;
        char o[2];
        printf("Enter The Size of the Array:");
        scanf("%d",&b);
        for(i=0;i<b;i++)
        {
                printf("Enter Element-%d:",i+1);
                scanf("%d",&a[i]);
        }
        while(true)
        {
                printf("Enter i for Insertion and d for Deletion:");
                scanf("%s",o);
                if(strcmp(o,"i")==0){
                printf("Enter The Element to Insert:");
                scanf("%d",&e);
                printf("Enter The Position to Insert:");
                scanf("%d",&c);
                t1=a[c];
                a[c]=e;
b++;
                for(i=c+1;i<b;i++)
                {
                        t2=a[i];
                        a[i]=t1;
                        t1=t2;
                }
                for(i=0;i<b;i++)
                {
                printf("%d ",a[i]);
                }
                printf("\n");
                }
                else if(strcmp(o,"d")==0)
                {
                        printf("Enter the Element to be
Deleted:");
                        scanf("%d",&e);
                        for(i=0;i<b;i++)
                        {
                                if(a[i]==e)
                                {
        for(j=i;j<b;j++)        {               a[j]=a[j+1];
                                                }
                                                b--;
                                }
                        }
                        for(i=0;i<b;i++)
                        {
                        printf("%d ",a[i]);
                        }
                        printf("\n");
                        }
```

INPUT AND OUTPUT :

```
Enter The Size of the Array:2
Enter Element-1:1
Enter Element-2:2
Enter i for Insertion and d for Deletion:i
Enter The Element to Insert:3
Enter The Position to Insert:2
1 2 3
Enter i for Insertion and d for Deletion:
```

RESULT :

The C Program for Performing Insertion and Deletion in an Array is Compiled and Executed Using Dev-C++ and the Output is Verified.

DAY-2 (Data-Structures) Lab Session

EXP - 5

TITLE : C Program to Merge Two Arrays.

PROGRAM :

```
#include <stdio.h>
int main()
{
        int a[100],b[100],i,c,d,j=0;
        printf("Enter The Size of First Array:");
        scanf("%d",&c);
        printf("Enter The Size of Second Array:");
        scanf("%d",&d);
        printf("Enter The Elements into the 1st Array\n");
        for(i=0;i<c;i++)
        {
                printf("Enter Element-%d:",i+1);
                scanf("%d",&a[i]);
        }
        printf("Enter The Elements into the 2nd Array\n");
        for(i=0;i<d;i++)
        {
                printf("Enter Element-%d:",i+1);
                scanf("%d",&b[i]);
        }
```

```
for(i=c;i<c+d;i++)
        {
                a[i]=b[j];
                j++;
        }
        printf("The Merged Array:\n{");
        for(i=0;i<c+d;i++)
        {
                if(i<c+d-1)
                {
                        printf("%d,",a[i]);
                }
                else
                {
                        printf("%d}",a[i]);
                }
        }
}
```

INPUT AND OUTPUT :

```
Enter The Size of First Array:2
Enter The Size of Second Array:2
Enter The Elements into the 1st Array
Enter Element-1:1
Enter Element-2:2
Enter The Elements into the 2nd Array
Enter Element-1:3
Enter Element-2:4
The Merged Array:
{1,2,3,4}
```

RESULT :

The C Program for Merging Two Arrays is Compiled and Executed Using Dev-C++ and the Output is Verified.

DAY-2 (Data-Structures) Lab Session

EXP - 6

TITLE : C Program to Find Duplicate Value in an Array

PROGRAM :

```
#include <stdio.h>
int main()
{
        int a[100],b,i,c,d=0,j[100];
        printf("Enter The Size of the Array:");
        scanf("%d",&b);
        for(i=0;i<b;i++)
        {
                printf("Enter Element-%d:",i+1);
                scanf("%d",&a[i]);
        }
        printf("Enter The Search its Duplicate:");
        scanf("%d",&c);
        for(i=0;i<b;i++)
        {
                if(c==a[i])
                {
                        j[d]=i;
                        d++;
                }
        }
        printf("The %d Duplicate(s) are Present in Index Positions : ",d-1);
        for(i=1;i<d;i++)
        {
                printf("%d ",j[i]);
        }
}
```

INPUT AND OUTPUT :

```
Enter The Size of the Array:3
Enter Element-1:1
Enter Element-2:1
Enter Element-3:2
Enter The Search its Duplicate:1
The 1 Duplicate(s) are Present in Index Positions : 1
```

RESULT :

The C Program for finding the duplicate values is Compiled and Executed Using Dev-C++ and the Output is Verified.

DAY-2 (Data-Structures) Lab Session

EXP - 7

TITLE : C Program to Find Largest Element in an Array.

PROGRAM :

```
#include <stdio.h>
int main()
{
	int a[100],b,max=0,i;
	printf("Enter The Size of the Array:");
	scanf("%d",&b);
	for(i=0;i<b;i++)
	{
		printf("Enter Element-%d:",i+1);
		scanf("%d",&a[i]);
	}
	max=0;
	for(i=0;i<b;i++)
	{
		if(a[i]>max)
		{
			max=a[i];
		}
	}
	printf("The Largest Element in the array is %d",max);
}
```

INPUT AND OUTPUT :

```
Enter The Size of the Array:3
Enter Element-1:99
Enter Element-2:87
Enter Element-3:454
The Largest Element in the array is 454
```

RESULT :

The C Program for finding the largest Number in an Array is Compiled and Executed Using Dev-C++ and the Output is Verified.

DAY-2 (Data-Structures) Lab Session

EXP - 8

TITLE : C Program to Search an Element in an array using linear search.

PROGRAM :

```
#include <stdio.h>
int main()
{
        int a[100],b,c,j=0,i;
        printf("Enter The Size of the Array:");
        scanf("%d",&b);
        for(i=0;i<b;i++)
        {
                printf("Enter Element-%d:",i+1);
                scanf("%d",&a[i]);
        }
        printf("Enter The Element to be Searched:");
        scanf("%d",&c);
        for(i=0;i<b;i++)
        {
                if(a[i]==c)
                {
                        printf("Element found at %d index",i);
                        j++;
                        break;
                }
        }
        if(j==0)
        {
                printf("Element Not found");
        }
}
```

INPUT AND OUTPUT :

```
Enter The Size of the Array:4
Enter Element-1:1
Enter Element-2:2
Enter Element-3:3
Enter Element-4:4
Enter The Element to be Searched:5
Element Not found
```

RESULT :

The C Program for finding an element in an Array Using Linear Search is Compiled and Executed Using Dev-C++ and the Output is Verified.

DAY-2 (Data-Structures) Lab Session

EXP - 9

TITLE : C Program to Search an Element in an array using Binary search.

PROGRAM :

```
#include <stdio.h>
int main()
{
	int a[100],l,m,h,b,e,f=0,i;
	printf("Enter The Size of the Array:");
	scanf("%d",&b);
	for(i=0;i<b;i++)
	{
		printf("Enter Element-%d:",i+1);
		scanf("%d",&a[i]);
	}
	printf("Enter The Element to be Searched For:");
	scanf("%d",&e);
	l=0;
	h=l-1;
	while(f!=1)
	{
		m=(l+h)/2;
		if(a[m]==e)
		{
			f=1;
```

```
{
			m=(l+h)/2;
			if(a[m]==e)
			{
				f=1;
				printf("Element Found at %d index",m);
				break;
			}
			else if(e>a[m])
			{
				l=m;
			}
			else
			{
				h=m;
			}
		}
}
```

INPUT AND OUTPUT :

```
Enter The Size of the Array:4
Enter Element-1:1
Enter Element-2:8
Enter Element-3:7
Enter Element-4:4
Enter The Element to be Searched For:7
Element Found at 2 index
--------------------------------
```

RESULT :

The C Program for finding an element in an Array Using Binary Search is Compiled and Executed Using Dev-C++ and the Output is Verified.

DAY-2 (Data-Structures) Lab Session

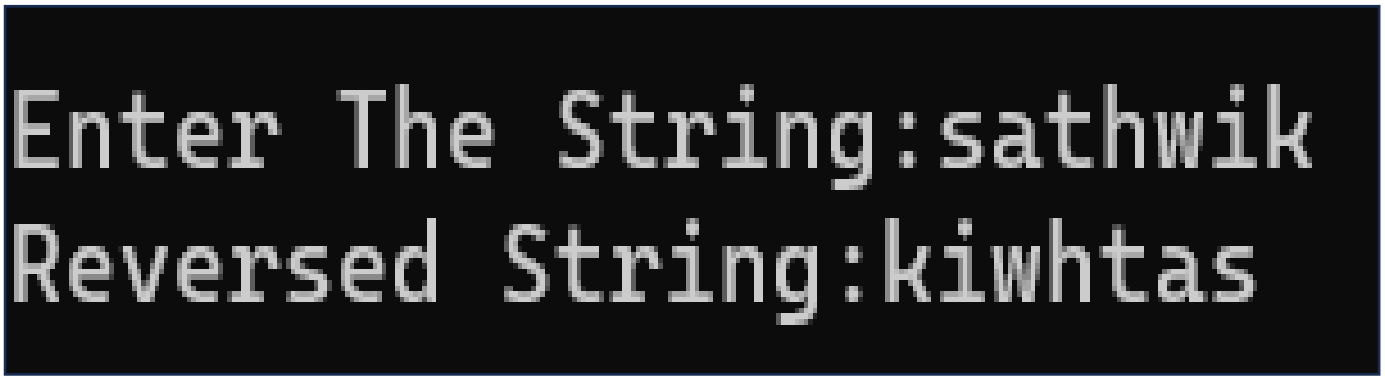
EXP - 10

TITLE : C Program to Reverse a Given String.

PROGRAM :

```
#include <stdio.h>
#include <string.h>
int main()
{
    char a[100],b[100];
    int i,j=0;
    printf("Enter The String:");
    scanf("%s",a);
    for(i=strlen(a)-1;i>=0;i--)
    {
        b[j]=a[i];
        j++;
    }
    printf("Reversed String:%s",b);
}
```

INPUT AND OUTPUT :



RESULT :

The C Program for Reversing a Given String is Compiled and Executed Using Dev-C++ and the Output is Verified.

DAY-2 (Data-Structures) Lab Session

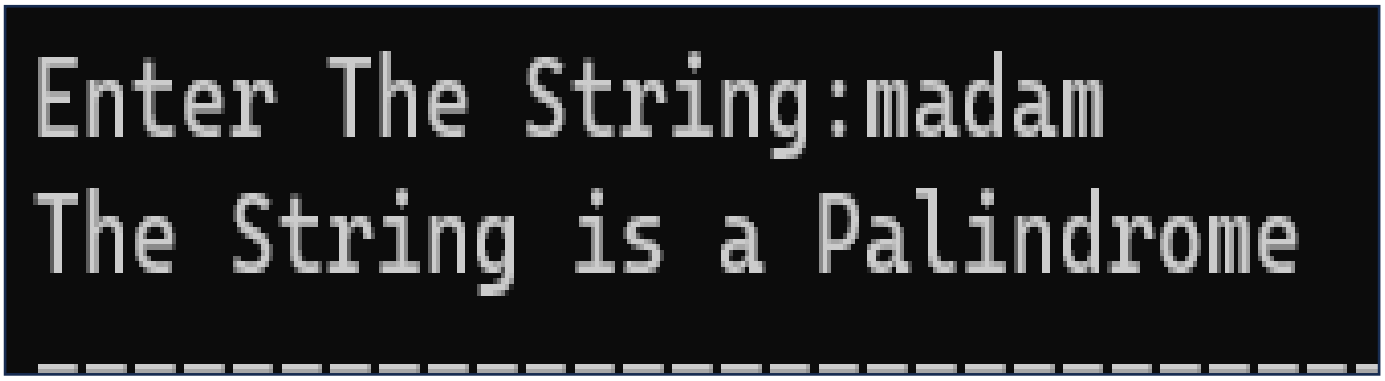
EXP - 11

TITLE : C Program to Check The Given String is Palindrome or Not.

PROGRAM :

```
#include <stdio.h>
#include <string.h>
int main()
{
        char a[100],b[100];
        int i,j=0;
        printf("Enter The String:");
        scanf("%s",a);
        for(i=strlen(a)-1;i>=0;i--)
        {
                b[j]=a[i];
                j++;
        }
        if(strcmp(a,b)==0)
        {
                printf("The String is a Palindrome");
        }
        else
        {
                printf("The String is not a Palindrome");
        }}
```

INPUT AND OUTPUT :



RESULT :

The C Program for Checking a Given String is Palindrome or not is Compiled and Executed Using Dev-C++ and the Output is Verified.

DAY-2 (Data-Structures) Lab Session

EXP - 12

TITLE : C Program to Check and Count the Vowels in a Given String.

PROGRAM :

```
#include <stdio.h>
#include <string.h>
int main()
{
	char a[100];
	int i,ac=0,ec=0,ic=0,oc=0,uc=0;
	printf("Enter The String:");
	scanf("%s",a);
	for(i=0;i<strlen(a);i++)
	{
		if(a[i]=='a' || a[i]=='A')
		{
			ac+=1;
		}
		else if(a[i]=='e' || a[i]=='E')
		{
			ec+=1;
		}
		else if(a[i]=='i' || a[i]=='I')
		{
			ic+=1;
		}
		else if(a[i]=='o' || a[i]=='O')
		{
			oc+=1;
		}
		else if(a[i]=='u' || a[i]=='U')
		{
			uc+=1;
		}
	}
	if(ac==0 && ec==0 && ic==0 && oc==0 && uc==0)
	{
		printf("There are No vowels in the given string");
	}
	else
	{
		printf("There are %d vowel(s) in the given string\n",ac+ec+ic+oc+uc);
		printf("A Count:%d\n",ac);
		printf("E Count:%d\n",ec);
		printf("I Count:%d\n",ic);
		printf("O Count:%d\n",oc);
		printf("U Count:%d",uc);
	}
```

INPUT AND OUTPUT :

```
Enter The String:sathwik
There are 2 vowel(s) in the given string
A Count:1
E Count:0
I Count:1
O Count:0
U Count:0
```

RESULT :

The C Program for Counting and Printing the Number of Vowels is Compiled and Executed Using Dev-C++ and the Output is Verified.

DAY-2 (Data-Structures) Lab Session

EXP - 13

TITLE : C Program for Matrix Multiplication.

PROGRAM :

```
#include <stdio.h>
int main()
{
        int a[10][10],b[10][10],c[10][10];
        int i,j,k,l;
        printf("Enter No of Rows in the Matrix:");
        scanf("%d",&l);
        printf("Enter First Matrix of Order %dx%d\n",l,l);
        for(i=0;i<l;i++)
        {
                for(j=0;j<l;j++)
                {
                        scanf("%d",&a[i][j]);
                }
        }
        printf("Enter Second Matrix of Order %dx%d\n",l,l);
        for(i=0;i<l;i++)
        {
                for(j=0;j<l;j++)
                {
                        scanf("%d",&b[i][j]);
                }}
```

```
printf("The Resultant Matrix:\n");
        for(i=0;i<l;i++)
        {
                for(j=0;j<l;j++)
                {
                        c[i][j]=0;
                        for(k=0;k<l;k++)
                        {

        c[i][j]+=a[i][k]*b[k][j];
                        }
                }
        }
        for(i=0;i<l;i++)
        {
                for(j=0;j<l;j++)
                {
                        printf("%d ",c[i][j]);
                }
                printf("\n");
        }
}
```

INPUT AND OUTPUT :

```
Enter No of Rows in the Matrix:2
Enter First Matrix of Order 2x2
1 2
3 4
Enter Second Matrix of Order 2x2
5 6
7 8
The Resultant Matrix:
19 22
43 50
```

RESULT :

The C Program for performing matrix multiplication is Compiled and Executed Using Dev-C++ and the Output is Verified.