Experiment- 7: Arrays

7.1) write a C program to search an element in the given array (Linear Search)

```
# include < stdio .h>
main ()
{
int a[20] ,i,key ,n, flag =0;
printf ("How many elements ?");
scanf ("%d" ,&n);
printf (" Enter array elements :\n");
for (i =0;i<n ;++ i)
scanf ("%d" ,&a[i ]);
printf ("\ nEnter element to search :");
scanf ("%d" ,&key );
for (i =0;i<n ;++ i)
if(a[i ]== key )
{
flag ++;
break ;
}
}
if( flag !=0)
printf (" Element found at index %d",i);
else
printf (" Element not found ");
}
```

Output:

```
Compilation :[-----]$ cc filename .c
Execution :[----] $ ./a. out
How many elements ?4
Enter array elements :
6 8 9 1
Enter element to search :9
Element found at index 2
```

7.2) Write a C program to perform matrix addition.

```
#include<stdio.h>
main()
{
 int a[10][10],b[10][10],c[10][10],i,j;
 printf("Enter elements into A matrix");
 for(i=0;i<3;i++)
 {
  for(j=0;j<3;j++)
  {
   scanf("%d",&a[i][j]);
  }
 }
 printf("Enter elements into B matrix");
 for(i=0;i<3;i++)
 {
  for(j=0;j<3;j++)
  {
   scanf("%d",&b[i][j]);
  }
 }
printf("Addition of 2 matrices is\n");
for(i=0;i<3;i++)
 {
  for(j=0;j<3;j++)
  {
   c[i][j]=a[i][j]+b[i][j];
  }
 }
 for(i=0;i<3;i++)
 {
  for(j=0;j<3;j++)
  {
   printf("%d",c[i][j]);
  }
 printf("\n");
 }
}
```

Output:

Compilation :[-----]$ cc filename .c
Execution :[----] $ ./a. out
Enter elements into A matrix1 2 3 4 5 6 7 8 9
Enter elements into B matrix1 2 3 4 5 6 7 8 9
Addition of 2 matrices is

2 4 6
8 10 12
14 16 18

7.3) Write a C program to perform matrix multiplication.

```
#include<stdio.h>
main()
{
 int a[10][10],b[10][10],c[10][10],i,j,k;
 printf("enter elements into a matrix");
 for(i=0;i<2;i++)
 {
  for(j=0;j<2;j++)
  {
   scanf("%d",&a[i][j]);
  }
 }
 printf("enter elements into b matrix");
 for(i=0;i<2;i++)
 {
  for(j=0;j<2;j++)
  {
   scanf("%d",&b[i][j]);
  }
 }
printf("matrix multiplication is\n");
for(i=0;i<2;i++)
{
for(i=0;i<2;i++)
{
 for(j=0;j<2;j++)
 {
  c[i][j]=0;
  for(k=0;k<2;k++)
  {
   c[i][j]=c[i][j]+a[i][k]*b[k][j];
  }
 }
}
for(i=0;i<2;i++)
 {
  for(j=0;j<2;j++)
  {
   printf("%d\t",c[i][j]);
  }
 printf("\n");
```

```
}
}
```

Output:

```
Compilation :[-----]$ cc filename .c
Execution :[----] $ ./a. out
enter elements into a matrix1
2
3
4
enter elements into b matrix1
2
3
4
matrix multiplication is
7       10
15      22
```

Experiment- 8:Strings

8.1)Implementation of string manipulation operations with library function .

a) copy

b) concatenate

c) length

d) compare

(a) COPY

```
# include < stdio .h >
# include < string .h >
main ()
{
char str1 [10]= " awesome ";
char str2 [10];
char str3 [10];
strcpy ( str2 , str1 );
strcpy ( str3 , " well ");
puts ( str2 );
puts ( str3 );
}
```

Output:

awesome
well

(b) CONCATENATE

```
# include < stdio .h >
# include < string .h >
main ()
{
char str1 [20] = " Aditya ", str2 [20] = " college ";
strcat ( str1 , str2 );
puts ( str1 );
}
```

Output : Adityacollege

(c) LENGTH

```
# include < stdio .h >
# include < string .h >
main ()
{
char a [20]= " Program ";
char b [20]={ 'P','r','o','g','r','a','m','\0 '};
char c [20];
printf (" Enter string : ");
gets ( c );
printf (" Length of string a = %d \n", strlen ( a ));
printf (" Length of string b = %d \n", strlen ( b ));
printf (" Length of string c = %d \n", strlen ( c ));
}
```

Output:

```
Enter string : String
Length of string a = 7
Length of string b = 7
Length of string c = 6
```

(d) COMPARE

```
# include < stdio .h >
# include < string .h >
main ()
{
char str1 [] = " abcd ", str2 [] = " abcd ";
int result ;
result = strcmp ( str1 , str2 );
if( result ==0)
printf ("Two strings are equals ");
else
printf ("Two strings are not equal ");
}
```

Output:
Two strings are equals

8.2) Implementation of string manipulation operations without library function .
a) copy
b) concatenate
c) length
d) compare
(a) copy one string to other

```
# include < stdio .h >
main ()
{
char s1 [100] , s2 [100];
int i=0;
printf ("\ nEnter the string :");
gets ( s1 );
while ( s1 [ i ] != '\0 ')
{
s2 [ i] = s1 [ i ];
i ++;
}
s2 [ i] = '\0 ';
printf ("\ nCopied String is %s ", s2 );
}
```

Output :
Enter the string : Aditya
Copied String is Aditya

(b) Concatenation of strings

```
# include < stdio .h >
# include < string .h >
main () {
char s1 [50] , s2 [30];
int i , j , len ;
printf ("\ nEnter String 1 :");
gets ( s1 );
printf ("\ nEnter String 2 :");
gets ( s2 );
```

```
for ( i =0; s1 [ i ] != ’\0 ’; i ++)
len ++;
for ( j = 0; s2 [ j ] != ’\0 ’; len ++ , j ++) {
s1 [ len ] = s2 [ j ];
}
s1 [ len ] = ’\0 ’;
printf (" concated string is :%s", s1 );
}
```

Output :

```
Enter String 1 : Aditya
Enter String 2 : college
Concated string is : Aditya college
```

(c) Calculating Length of the strings

```
# include < stdio .h >
main () {
char str [100];
int length , i ;
printf ("\ nEnter the String : ");
gets ( str );
length = 0;
for ( i =0; str [ i ] != ’\0 ’; i ++)
length ++;
printf ("\ nLength of the String is : %d", length );
}
```

Output:

```
Enter the string : aditya
Length of the string is :6
```

(d) compare two strings

```
# include < stdio .h >
# include < string .h >
main () {
char s1 [50] , s2 [30];
int i , j , flag =0;
printf ("\ nEnter String 1 :");
gets ( s1 );
printf ("\ nEnter String 2 :");
gets ( s2 );
for ( i =0 , j =0; s1 [ i ]!= \0 && s2 [ j ]!= \0 ; i ++ , j ++)
{
if( s1 [ i ]!= s2 [ j ])
{
flag ++;
```

```
break ;
}
}
if( flag ==0)
printf ("\ nTwo strings are equals ");
else
printf ("\ nTwo strings are not equal ");
}
```

Output :

```
Enter String 1 : aditya
Enter String 2 : aditya
Two strings are equals
```

8.3) Verify whether the given string is a palindrome or not

```
# include < stdio .h >
# include < string .h >
int main ()
{
char string1 [20];
int i , length ;
int flag = 0;
printf (" Enter a string :");
scanf ("%s", string1 );
length = strlen ( string1 );
for ( i =0; i < length ; i ++)
{
if( string1 [ i ] != string1 [ length -i -1]){
flag = 1;
break ;
}
}
if ( flag ) {
printf ("%s is not a palindrome ", string1 );
}
else {
printf ("%s is a palindrome ", string1 );
}
return 0;
}
```

Output :

```
Enter a string : madam
madam is a palindrome
Enter a string : aditya
aditya is not a palindrome
```