

Name:Aditya Vinayak Patil

SEA 42

Experiment 7

LCS:

```
#include<stdio.h>
#include<string.h>
char x[100000],y[100000],b[1000][1000];
int i,j,m,n,a,c[1000][1000];
void lcs_length(){
    m=strlen(x);
    printf("For String %s X is length %d\n",x,m);
    n=strlen(y);
    printf("For String %s Y is Length %d\n",y,n);
    for(i=0;i<=m;i++){
        c[i][0]=0;
    }
    for(j=0;j<=n;j++){
        c[0][j]=0;
    }
    for(i=1;i<=m;i++){
        for(j=1;j<=n;j++){
            if(x[i-1]==y[j-1]){
                c[i][j]=c[i-1][j-1]+1;
                b[i][j]='c';// \direction arrow
            }
            else{
                if(c[i-1][j]>=c[i][j-1]){
                    c[i][j]=c[i-1][j];
                    b[i][j]='u';// | upper arrow
                }
                else{
                    c[i][j]=c[i][j-1];
                    b[i][j]='l';// _ left side arrow
                }
            }
        }
    }
    for(i=0;i<=n;i++){
        for(j=0;j<=m;j++){
            printf("%d ",c[j][i]);
        }
        printf("\n");
    }
    print_lcs(m,n);
}
void print_lcs(int i,int j){
    if(i==0 || j==0)
        return ;
    if(b[i][j]=='c'){
        print_lcs(i-1,j-1);
    }
```

```

        printf("%c",x[i-1]);}
else if(b[i][j]=='u'){
    print_lcs(i-1,j);}
else{
    print_lcs(i,j-1);
}
}
int main(){
    printf("Welcome to the LCS Implementation in C");
    printf("\n Enter 1st Sequence ");
    gets(x);
    printf("\nEnter the 2nd Sequence");
    gets(y);
    printf("\n Longest Common Subsequence is:\n");
    lcs_length();
    return 0;}

```

Output:

Welcome to the LCS Implementation in C

Enter 1st Sequence AGGTAB

Enter the 2nd SequenceGXTXAYB

Longest Common Subsequence is:

For String AGGTAB X is length 6

For String GXTXAYB Y is Length 7

0 0 0 0 0 0 0

0 0 1 1 1 1 1

0 0 1 1 1 1 1

0 0 1 1 2 2 2

0 0 1 1 2 2 2

0 1 1 1 2 3 3

0 1 1 1 2 3 3

0 1 1 1 2 3 4

GTAB