Q) Write a C program to implement the Longest Common Subsequence.
Sample Inputs & outputs
The LCS of HUMAN and CHIMPANZEE is HMAN

Solⁿ)

```
#include <stdio.h>
#include <string.h>
int i, j, m, n, LCS_table[20][20];
char S1[20] = "HUMAN", S2[20] =
                    "CHIMPANZEE", b[20][20];

Void lcsAlgo(){
    m = Strlen(S1);
    n = Strlen(S2);
   for(i = 0; i <= m; i++)
       LCS_table [i][0]=0;

   for (i=0; i <=n; i++)
       LCS_table[0][i]=0;
```

```
for(i=1;i<=m;i++)
  for(j=1;j<=n;j++)
    if(s1[i-1]==s2[j-1]){
LCS-table[i][j]=LCS-table[i-1][j-1]+1;
}
elseif(LCS-table[i-1][j] >=LCS-table[i][j-1]){
    LCS-table[i][j]=LCS-table[i-1][j];
}
else{
    LCS-table[i][j] = LCS-table[i][j-1];
 }
}
int index = LCS-table[m][n];
 char LcsAlgo[index+1];
  lcsAlgo[index]='\0';

  int i=m; j=n;
  while(i>0 && j>0){
     if(s1[i-1]==s2[j-1]){
       lcsAlgo[index-1]=s1[i-1];
       i--; j--;
```

```
        index --;
      }
    else if (LCS-table [i - 1] [j] >LCS_table[i][j-1])
            i --;
      else
          j --;
  }
   printf("S1 : %s \nS2 : %s\n", S1, S2);
    printf("LCS : %s", lcsAlgo);
}

int main(){
        lcsAlgo();
         printf("\n");
 }
```

1906534 ④

② Write a program to implement the matrix chain multiplication problem using M-table & S-table oo to find optimal ordering of matrix multiplication.

Sol^n)
```
#include <limits.h>
#include <stdio.h>

int MatrixChainOrder(int p[], int n){

    int m[n][n];
    int i, j, k, L, q;

    for(i=1; i<n; i++)
        m[i][i]=0;

    for (L=2; L<n; L++){
        for (i=1; i<n-L+1; i++)
        {
            j = i+L-1;
            m[i][j] = INT_MAX;

        for(k=i; k<=j-1; k++){
            q = m[i][k]+ m[k+1][j]+ p[i-1]*p[k]
                *p[j];
```

1906534

```
    if (q< m[i][j])
        m[i][j] = q;
      }
   }
}

return m[1][n-1];

int main() {
     int arr[] = {1, 2, 3, 4};
     int size  = size of(arr)/ size of(arr[0]);
     printf("Minimum number of multip-
          -lication is %d",
               MatrixChainOrder(arr, size));
        return0;
}.
```