DAA LAB06

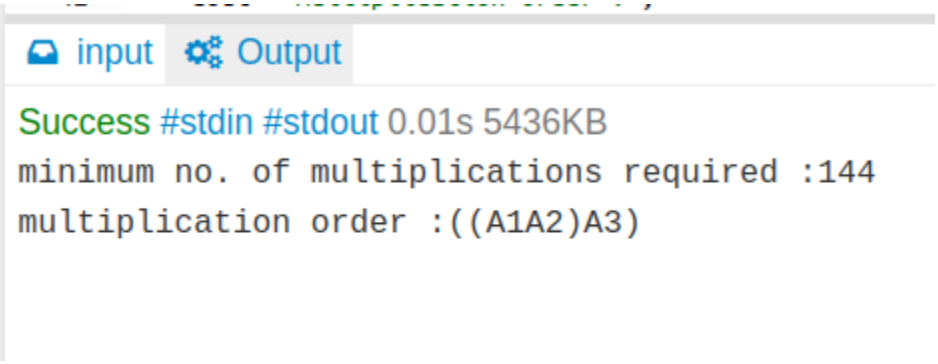
1)matrix chain multiplication
Code:

```
#include <bits/stdc++.h>
using namespace std;
int n;  // no. of matrix
int k[10001][10001]={0}; // matrix for remember cuts

void p_o_p(int i,int j){    //priint_optimal_parens -> prints the multiplication order
        if(i==j)
        cout<<"A"<<i;
        else{
                cout<<"(";
                p_o_p(i,k[i][j]);
                p_o_p(k[i][j]+1,j);
                cout<<")";
        }
}

int main() {
        int n;
        cin>>n;
        int p[n+1];    // order array
        int c[n+1][n+1]={0};   // cost array

        for(int i=0;i<=n;i++)cin>>p[i];
        for(int i=1;i<=n;i++)c[i][i]=0;


        for(int l=2;l<=n;l++){
                for(int i=1;i<=n-l+1;i++){
                        int j=i+l-1;
                        c[i][j] = INT_MAX;
                        for(int a=i;a<=j;a++){
                                int q = c[i][a]+c[a+1][j]+ (p[i-1]*p[a]*p[j]);
                                if(q < c[i][j]){
                                        c[i][j] = q;
                                        k[i][j] = a;
                                }
                        }
                }
        }
```

```
        cout<<"no. of multiplications :"<<c[1][n]<<"\n";
        cout<<"multiplication order :";

        p_o_p(1,n);
        return 0;
}
```

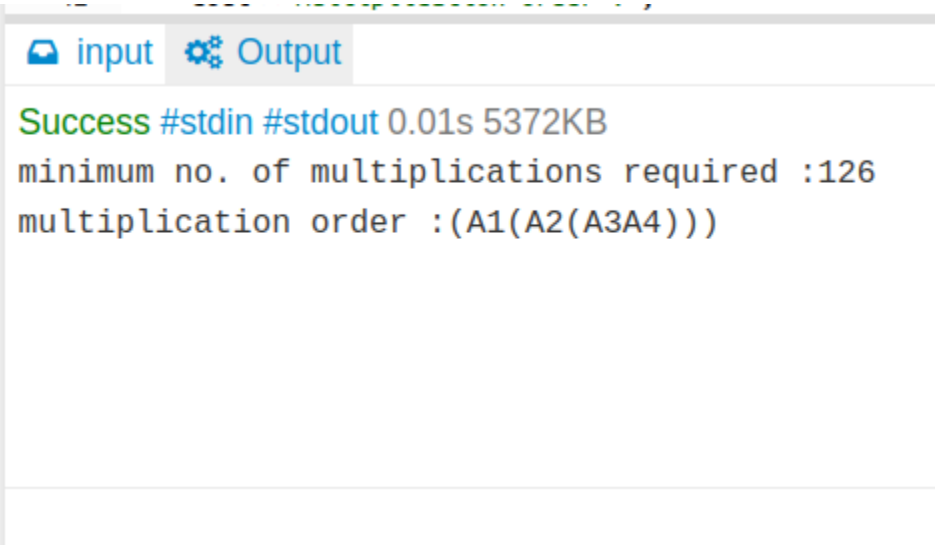
INPUT 1:
No .of matrix = 3;
Matrix order array={3,5,4,7}

OUTPUT 1:



INPUT 2:
No .of matrix = 4;
Matrix order array={3,5,4,7,2}

OUTPUT 2:



INPUT 3:
No .of matrix = 6;
Matrix order array={30, 35, 15, 5 ,10, 20, 25}

OUTPUT 3: