**Matrix Chain Multiplication**

#include <bits/stdc++.h>

int solve(vector<int> &arr, int i, int j, vector<vector<int>> &dp){

if(i>=j) return 0;

if(dp[i][j] != -1)

return dp[i][j];

int temp\_ans;

int min\_ans = 1e9;

for(int k=i; k<j; k++){

temp\_ans = solve(arr,i,k,dp) + solve(arr,k+1,j,dp) + arr[i-1]\*arr[k]\*arr[j];

if(temp\_ans<min\_ans)

min\_ans = temp\_ans;

}

dp[i][j] = min\_ans;

return min\_ans;

}

int matrixMultiplication(vector<int> &arr, int N)

{

vector<vector<int>> dp(N, vector<int>(N, -1));

return solve(arr,1,N-1,dp);

}