**// Program 06: Write and execute a program for matrix chain multiplication for the given sequence of Matrices {A1, A2 . . . . . An}.**

#include <stdio.h>

#include <conio.h>

**//Function for matrix chain multiplication**

int MCM(long int p[], long int n)

**//main program**

int main()

{

long int arr[10],n,i;

clrscr();

printf("Enter the numbre of matrices\n");

scanf("%ld", &n);

printf("Enter the sizes of matrices (p0,p1....)\n");

for(i=0;i<=n;i++)

scanf("%ld", &arr[i]);

printf("Minimum number of multiplications is :\n");

MCM(arr, n+1);

}

{

long int m[10][10];

long 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] = 30000;

for (k=i; k<=j-1; k++)

{

q = m[i][k] + m[k+1][j] + p[i-1]\*p[k]\*p[j];

if (q < m[i][j])

m[i][j] = q;

}

}

}

printf("-------------------------------------------\n");

for (i = 1; i < n; i++)

**OUTPUT 01 :-**

Enter the numbre of matrices

6

Enter the sizes of matrices (p0,p1....)

30 35 15 5 10 20 25

Minimum number of multiplications is :

-------------------------------------------

0 15750 7875 9375 11875 15125

-- 0 2625 4375 7125 10500

-- -- 0 750 2500 5375

-- -- -- 0 1000 3500

-- -- -- -- 0 5000

-- -- -- -- -- 0

**OUTPUT 02:-**

Enter the numbre of matrices

4

Enter the sizes of matrices (p0,p1....)

5 6 4 2 3

Minimum number of multiplications is :

-------------------------------------------

0 120 108 138

-- 0 48 84

-- -- 0 24

-- -- -- 0

{

for (j = 1; j < n; j++)

if(i<j)

printf("%ld\t", m[i][j]);

else if( i== j)

printf("0\t");

else

printf("--\t");

printf("\n");

}

}

OR  
  
#include <stdio.h>

// Function for Matrix Chain Multiplication

int MCM(long int p[], long int n) {

long int m[10][10];

long 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] = 30000;

for (k = i; k <= j - 1; k++) {

q = m[i][k] + m[k + 1][j] + p[i - 1] \* p[k] \* p[j];

if (q < m[i][j])

m[i][j] = q;

}

}

}

// Print Cost Matrix

printf("-------------------------------------------\n");

for (i = 1; i < n; i++) {

for (j = 1; j < n; j++) {

if (i < j)

printf("%ld\t", m[i][j]);

else if (i == j)

printf("0\t");

else

printf("--\t");

}

printf("\n");

}

return m[1][n - 1];

}

// Main Function

int main() {

long int p[10], n, i;

printf("Enter the number of matrices: ");

scanf("%ld", &n); // Number of matrices

printf("Enter %ld dimensions:\n", n + 1);

for (i = 0; i <= n; i++) {

printf("p[%ld] = ", i);

scanf("%ld", &p[i]);

}

int result = MCM(p, n + 1);

printf("Minimum number of multiplications is: %d\n", result);

return 0;

}