LAB 11 : MATRIX CHAIN MULTIPLICATION

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CODE

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Write a program to implement Matrix Chain Multiplication

and test it on the following input {20, 10, 5, 35, 45, 5, 10, 15}.

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#include<stdio.h>

#define MAX 35000

#define SIZE 20

int m[SIZE][SIZE],s[SIZE][SIZE];

void print\_Sol(int i,int j){

if(i==j)

printf("A%d " ,i);

else if(j>i)

{

printf("(");

print\_Sol(i,s[i][j]);

print\_Sol(s[i][j]+1,j);

printf(")");

}

}

void matrix\_multiply\_parenthesis(int p[],int n){

// m : store the minimum multiplcation cost

//s[i][j] : sore the value of index k giving least multiplication cost for ai x aj

int i,j,k,l,q=MAX,q\_min\_prev=MAX;

int p\_count=1;

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

m[i][i] = 0;

}

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

printf("\t Possible Solutions \n");

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

for(l=2;l<=n;l++) //l is the length of the chain

{

for(i=1;i<=n-l+1;i++) //starting index of chain of length l

{ j=i+l-1; // ending index of chain of length l

m[i][j] = MAX;

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

{

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

printf("\t-> %d. %d\n",p\_count,q);

p\_count++;

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

{

m[i][j] = q;

s[i][j] = k;

}

}

}

}

}

int main(){

int p[SIZE]={20, 10, 5, 35, 45, 5, 10, 15};

int n=7,i,j;

printf("\n\t MATRIX CHAIN MULTIPLICATION\n");

printf("\n");

matrix\_multiply\_parenthesis(p,n);

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

printf("\tMatrix Sequence\n");

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

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

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

printf("\t %d ",s[i][j]);

} printf("\n");

}

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

printf("\t Putting Optimal Paranthesis\n");

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

print\_Sol(1,n);

printf("\n\n");

}

SCREENSHOTS

