S.No: 10	Exp. Name: ***Program to compute Optimal Paranthesization for given Matrix chain order***	Date:

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Aim:

Program to compute Optimal Paranthesization for given Matrix chain order

Source Code:

chainMultiplication.c

```
#include<stdio.h>
#include<conio.h>
#include<limits.h>
int m[20][20],s[20][20];
void Print_optimal_parens(i,j)
{
   if(i==j)
   {
      printf("A%d",i);
   }
   else
   {
      printf("(");
      Print_optimal_parens(i,s[i][j]);
      Print_optimal_parens(s[i][j]+1,j);
      printf(")");
   }
}
void Matrix_chain_order(int p[],int n)
{
   int q,j,i,l,k;
   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];
            if(q<m[i][j])
            {
               m[i][j]=q;
               s[i][j]=k;
            }
         }
      }
   }
   Print_optimal_parens(1,n);
}
void main()
{
   int n;
   printf("enter the matrices");
   scanf("%d",&n);
   int p[n];
   for(int i=0;i<=n;i++)
   {
```

```
      scanf("%d",&p[i]);
   }
   Matrix_chain_order(p,n);
   printf("%d",m[1][n]);
}
```


Execution Results - All test cases have succeeded!

Test Case - 1	
User Output	
enter the matrices 3	
4	4
5	5
6	6
7	7
((A1A2)A3)288	