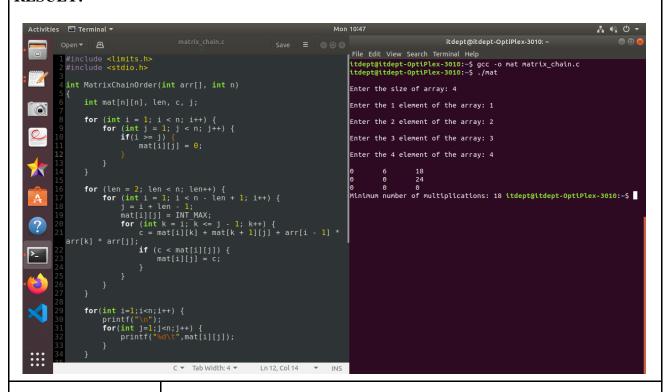
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AIM:	To implement Matrix Chain Multiplication	
Program		
PROBLEM STATEMENT:	To implement Matrix Chain Multiplication	
ALGORITHM/ THEORY:	Matrix chain multiplication is an optimization problem concerning the most efficient way to multiply a given sequence of matrices. The problem is not actually to perform the multiplications, but merely to decide the sequence of the matrix multiplications involved.	
	Begin define table minMul of size n x n, initially fill with all 0s for length := 2 to n, do fir i:=1 to n-length, do j := i + length - 1 minMul[i, j] := ∞ for k := i to j-1, do q := minMul[i, k] + minMul[k+1, j] + array[i-1]*array[k]*array[j] if q < minMul[i, j], then minMul[i, j] := q done done done return minMul[1, n-1] End	

```
PROGRAM:
                    #include <limits.h>
                    #include <stdio.h>
                    int MatrixChainOrder(int arr[], int n)
                        int mat[n][n], len, c, j;
                        for (int i = 1; i < n; i++) {
                            for (int j = 1; j < n; j++) {
                                 if(i >= j) {
                                    mat[i][j] = 0;
                        for (len = 2; len < n; len++) {
                            for (int i = 1; i < n - len + 1; i++) {
                                j = i + len - 1;
                                mat[i][j] = INT_MAX;
                                for (int k = i; k <= j - 1; k++) {
                                     c = mat[i][k] + mat[k + 1][j] + arr[i - 1] *
                    arr[k] * arr[j];
                                     if (c < mat[i][j]) {</pre>
                                         mat[i][j] = c;
                        for(int i=1;i<n;i++) {</pre>
                            printf("\n");
                            for(int j=1;j<n;j++) {</pre>
                                printf("%d\t",mat[i][j]);
                        return mat[1][n - 1];
                    int main()
```

```
//int arr[] = { 1, 2, 3, 4 };
//int n = sizeof(arr) / sizeof(arr[0]);
printf("\nEnter the size of array: ");
scanf("%d", &n);
int arr[n];
for(int i = 0 ; i < n ; i++) {
    printf("\nEnter the %d element of the array: ", i+1);
    scanf("%d", &arr[i]);
}
printf("\n\nMinimum number of multiplications: %d ",
    MatrixChainOrder(arr, n));
return 0;
}</pre>
```

RESULT:



CONCLUSION:

Successfully understood Matrix Chain Multiplication algorithm and implemented it in C program to find the minimum number of steps for multiplication of 2 matrices.