

# MATRIX-CHAIN-ORDER( $p, n$ )

```
1  let  $m[1:n, 1:n]$  and  $s[1:n-1, 2:n]$  be new tables
2  for  $i = 1$  to  $n$                                      // chain length 1
3       $m[i, i] = 0$ 
4  for  $l = 2$  to  $n$                                      //  $l$  is the chain length
5      for  $i = 1$  to  $n - l + 1$                          // chain begins at  $A_i$ 
6           $j = i + l - 1$                              // chain ends at  $A_j$ 
7           $m[i, j] = \infty$ 
8          for  $k = i$  to  $j - 1$                          // try  $A_{i:k}A_{k+1:j}$ 
9               $q = m[i, k] + m[k + 1, j] + p_{i-1}p_kp_j$ 
10             if  $q < m[i, j]$ 
11                  $m[i, j] = q$                          // remember this cost
12                  $s[i, j] = k$                          // remember this index
13  return  $m$  and  $s$ 
```