REDICTADO AyED 2020

Ejercicio 8

1. public static void uno (int n)
```
{
    int i, j, k ;
    int [] [] a, b, c;
    a = new int [n] [n];                cte1
    b = new int [n] [n];
    c = new int [n] [n];
    for ( i=1; i<=n-1; i++) {
        for ( j=i+1; j<=n; j++) {
            for ( k=1; k<=j; k++) {
                c[i][j] = c[i][j]+ a[i][j]*b[i][j];        cte2
            }
        }
    }
}
```

$$\textbf{cte1} + \sum_{i=1}^{n-1} \left(\sum_{j=i+1}^{n} \left(\sum_{k=1}^{j} \textbf{cte2} \right) \right) =$$

$$= \text{cte1} + \sum_{i=1}^{n-1} \left(\sum_{j=i+1}^{n} (j * \text{cte2}) \right) = \quad \text{cte1} + \sum_{i=1}^{n-1} \left(\text{cte2} \sum_{i+1}^{n} j \right) = \quad \text{cte1} + \sum_{i=1}^{n-1} \left(\text{cte2} * \left(\sum_{j=1}^{n} j - \sum_{j=1}^{i} j \right) \right) =$$

$$\sum_{i=1}^{n} c = n * c .$$

$$\sum_{i=1}^{n} i*c = c* \sum_{i=1}^{n} i .$$

$$\sum_{j=i+1}^{n} j = \sum_{j=1}^{n} j - \sum_{j=1}^{i} j$$

$$= \text{cte1} + \sum_{i=1}^{n-1} \left(\text{cte2} * \left(\frac{n(n+1)}{2} - \frac{i(i+1)}{2} \right) \right) = \text{cte1} + \sum_{i=1}^{n-1} \left(\text{cte2} * \left(\frac{n^2+n}{2} - \left(\frac{i^2+i}{2} \right) \right) \right) = \text{cte1} + \sum_{i=1}^{n-1} \left(\text{cte2} * \frac{n^2+n-i^2-i}{2} \right) =$$

$$\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$$

$$= \text{cte1} + \frac{\text{cte2}}{2} \sum_{i=1}^{n-1} (n^2 + n - i^2 - i) = \text{cte1} + \frac{\text{cte2}}{2} \left(\sum_{i=1}^{n-1} n^2 + \sum_{i=1}^{n-1} n - \sum_{i=1}^{n-1} i^2 - \sum_{i=1}^{n-1} i \right) =$$

$$x * \frac{a}{b} = \frac{x}{b} * a$$

$$= \text{cte1} + \frac{\text{cte2}}{2} \left((n-1)n^2 + (n+1)n - \left(\frac{(n-1).(n-1+1).(2(n-1)+1)}{6} \right) - \left(\frac{(n-1).(n-1+1)}{2} \right) \right) =$$

$$= \text{cte1} + \frac{\text{cte2}}{2} \left(n^3 - n^2 + n^2 - n - \left(\frac{(n^2-n).(2n-2+1)}{6} \right) - \left(\frac{n^2-n}{2} \right) \right) =$$

$$= \text{cte1} + \frac{\text{cte2}}{2} \left(n^3 - n - \left(\frac{(n^2-n).(2n-1)}{6} \right) - \left(\frac{n^2-n}{2} \right) \right) = \text{cte1} + \frac{\text{cte2}}{2} \left(n^3 - n - \left(\frac{2n^3-n^2-2n^2+n}{6} \right) - \left(\frac{n^2-n}{2} \right) \right) =$$

$$= \text{cte1} + \frac{\text{cte2}}{2} \left(\frac{6n^3-6n-2n^3+n^2+2n^2-n-3n^2+3n}{6} \right) = \text{cte1} + \frac{\text{cte2}}{2} \left(\frac{4n^3-4n}{6} \right) = \text{cte1} + \frac{\text{cte2}}{2} \left(\frac{4}{6}(n^3-n) \right) =$$

$$= \text{cte1} + \frac{cte2}{2} * (\frac{2}{3}n^3 - \frac{2}{3}n) \rightarrow \therefore O(n^3)$$