# ANÁLISIS DE COMPLEJIDAD EJERCICIO #9 - WORMS

## Análisis método cándido:

$$T(n) = 2 + 2 + 3 + 2 + \sum_{i=1}^{n}(5 + 5 + 2 + 1) + 3 + \sum_{j=0}^{m}(5\sum_{i=0}^{n}(5 + 3 + 2 + 1 + 2 + 1) + 2 + 1) + 1$$

$$T(n) = 13 + \sum_{i=1}^{n}(13) + \sum_{j=0}^{m}(8\sum_{i=0}^{n}(14))$$

$$T(n) = 13 + 13n + \sum_{j=0}^{m}(112n)$$

$$T(n) = 13 + 13n + 112n * m$$

$$T(n) \in O(n^2)$$

**Análisis método óptimo:**

$$T(n) = 2 + 2 + 3 + 2 + \sum_{i=1}^{n}(5 + 5 + 2 + 1) + 3 + \sum_{j=0}^{m}(5 + 7 + 8\log n + 1 + 1 + 2 + 2 + 1) + 1$$

$$T(n) = 13 + \sum_{i=1}^{n}(13) + \sum_{j=0}^{m}(21 + 8\log n)$$

$$T(n) = 13 + 13n + \sum_{j=0}^{m}(21) + \sum_{j=0}^{m}(8\log n)$$

$$T(n) = 13 + 13n + 21m + m * 8\log n)$$

$$T(n) \in O(nlogn)$$

**Análisis método auxiliar:**

$$T(n) = 2 + 3 + 1 + \sum_{i=1}^{\log n}(3 + 2 + 1 + 2) + 1$$

$$T(n) = 7 + \sum_{i=1}^{\log n}(8)$$

$$T(n) = 7 + 8\log n$$

$$T(n) \in O(\log n)$$