20191020147 - Cesar Andres Torres Bernal
20191020058 - Yuneider Parada Pérez

$$f(n) = A + n + 2f(n/2)$$

1) Calcular A

2) Calcular $f(2)$

3) Calcular $f(4)$ a partir de $f(2)$

4) Calcular $f(8)$ a partir de $f(4)$

5) Resuelve la ecuación en recurrencia

Quick Sort:

```
milad = i + (j-1)/2          6
pivote = a[milad]

do {
    while (a[i] < pivote) {   2
        i++;                  1
    }
    while (pivote < a[j]) {   2
        j--;                  1
    }
    if (i < j) {             1
        temp = a[j];         2
        a[j] = a[i];         3
        a[i] = temp;         2
        i++;                 1
        j--;                 1
    }
} while (i < j);             1

Quick Sort();                2
Quick Sort();
                          _____
                            25
```

A = 25

$$f(2) = 50$$

$$f(4) = 25 + 4 + 2f(2) = 129$$

$$f(8) = 25 + 8 + 2f(4) = 291$$

$$f(n) = A + n + 2f(n/2) \longrightarrow n = 2^i$$

$$f(2^i) = 25 + 2^i + 2f(2^{i-1})$$

$$f(i) - 2f(i-1) = 25 + 2^i \quad \text{①}$$

$$f(i-1) - 2f(i-2) = \frac{50 + 2^i}{2}$$

$$-2f(i-1) + 4f(i-2) = -50 - 2^i \quad \text{②}$$

$$\text{① + ②}$$

$$\begin{array}{l} f(i) - 4f(i-1) + 4f(i-2) = -25 \\ + \\ \underline{-f(i-1) + 4f(i-2) - 4f(i-3) = 25} \end{array}$$

$$f(i) - 5f(i-1) + 8f(i-2) - 4f(i-3) = 0$$

$$x^3 - 5x^2 + 8x - 4 = 0$$

$$r_1 = 1 \qquad r_2 = 2 \qquad r_3 = 2$$

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                            25
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① + ②

$f(i) - 4f(i-1) + 4f(i-2) = -25$

+ $-f(i-1) + 4f(i-2) - 4f(i-3) = 25$
_____

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$x^3 - 5x^2 + 8x - 4 = 0$

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