

Metodo esperto

martedì 31 maggio 2022 14:54

Si può applicare solo a:

$$T(n) = aT\left(\frac{n}{b}\right) + C(n)$$

$$a \geq 1, b > 1$$

$$D(n) + C(n) = f(N) \rightarrow \text{iterativa}$$

$$aT\left(\frac{n}{b}\right) \rightarrow \text{ricorsiva}$$

$$\rightarrow n^{\log_b a}$$

Dobbiamo confrontarla con $f(n)$

Abbiamo 3 casi:

1) $R(n) > F(n)$

$$\rightarrow f(n) = O(n^{\log_b a - E}), E > 0$$

$$\rightarrow \text{Tempo} = O(n^{\log_b a})$$

2) $F(n) > R(n)$

$$\rightarrow f(n) = O(n^{\log_b a + E}), E > 0$$

$$\rightarrow af\left(\frac{n}{b}\right) < kf(n)$$

$$\rightarrow \text{Tempo} = O(f(n))$$

3) $R(n) = F(n)$

$$\rightarrow \text{Tempo} = O(n^{\log_b a} * \log n)$$

Esempio:

$$t(n) = 2t\left(\frac{n}{2}\right) + n$$

$$f(n) = n$$

$$r(n) = n^{\log_b a} = n^{\log_2 2} = n$$

$$\rightarrow f(n) = r(n)$$

$$\rightarrow T(n) = O(n^{\log_2 2} * \log n) = O(n * \log n)$$

$$t(n) = 9t\left(\frac{n}{3}\right) + n$$

$$f(n) = n$$

$$r(n) = n^{\log_3 9} = n^2$$

$$r > n$$

$$f(n) = O(n^{\log_b a - E}), E > 0$$

$$f(n) = O(n^{2-E}), E > 0$$

$$2E \leq 1$$

$$T(n) = O(n^{\log_b a}) = O(n^2)$$