Equazioni di ricorrenza

1. [Cormen]
    1. $T(n) = 2T(n/2) + n^4$
    2. $T(n) = T(7n/10) + n$
    3. $T(n) = 16T(n/4) + n^2$
    4. $T(n) = 7T(n/3) + n^2$
    5. $T(n) = 7T(n/2) + n^2$
    6. $T(n) = 2T(n/4) + \sqrt{n}$
    7. $T(n) = T(n-2) + n^2$
    8. $T(n) = 4T(n/3) + n \ \log_2 n$
    9. $T(n) = 3T(n/3) + n/\log_2 n$
    10. $T(n) = 4T(n/2) + n^2\sqrt{n}$
    11. $T(n) = 3T(n/3 - 2) + n/2$
    12. $T(n) = 2T(n/2) + n/\log_2 n$
    13. $T(n) = T(n/2) + T(n/4) + T(n/8) + n$
    14. $T(n) = T(n-1) + 1/n$
    15. $T(n) = T(n-1) + \log_2 n$
    16. $T(n) = T(n-2) + 1/\log_2 n$
    17. $T(n) = \sqrt(n)T(\sqrt{n}) + n$
    18. $T(n) = \sqrt[3]{n}T(\sqrt[3]{n}) + \sqrt{n}$
2. [Jefferson]
    1. $T(n) = 2T(n/4) + \sqrt{n}$
    2. $T(n) = 2T(n/4) + n$
    3. $T(n) = 2T(n/4) + n^2$
    4. $T(n) = 3T(n/3) + \sqrt{n}$
    5. $T(n) = 3T(n/3) + n$
    6. $T(n) = 3T(n/3) + n^2$
    7. $T(n) = 4T(n/2) + \sqrt{n}$
    8. $T(n) = 4T(n/2) + n$
    9. $T(n) = 4T(n/2) + n^2$
    10. $T(n) = T(n/2) + T(n/3) + T(n/6) + n$
    11. $T(n) = T(n/2) + 2T(n/3) + 3T(n/4) + n^2$
    12. $T(n) = T(n/15) + T(n/10) + 2T(n/6) + \sqrt{n}$
    13. $T(n) = 2T(n/2) + O(n \log n)$
    14. $T(n) = 2T(n/2) + O(n/\log n)$
    15. $T(n) = \sqrt{n}T(\sqrt{n}) + n$
    16. $T(n) = \sqrt{2n}T(\sqrt{2n}) + \sqrt{n}$
3. [Esami]
    1. $T(n) = 2\sqrt{n}T(\sqrt{n}) + n$
    2. $T(n) = 2T(\sqrt{n}) + \log n$

3. $T(n) = 4T(n/4) + \sqrt{n}$
4. $T(n) = 3T(n/4) + \sqrt{n}$
5. $T(n) = 4T(n/9) + \sqrt{n}$
6. $T(n) = 15T(n/4) + n^2 \log n$
7. $T(n) = 2T(n/2) + T(n/4) + n$
8. $T(n) = 17T(n/2) + n^4$
9. $T(n) = T(3n/4) + T(n/2) + n$
10. $T(n) = 6T(n/8) + \sqrt{n}$
11. $T(n) = T(n/3) + T(n/4) + n$
12. $T(n) = 7T(n/2) + n^3 \log n$
13. $T(n) = T(2n/3) + T(n/3) + n^3$?
14. $T(n) = 3T(\sqrt{n}) + \log n$

Asintoticità

1. [Esami]
    1. Si dimostri la verità o la falsità della seguente affermazione:
        1. Se $2^{f(n)} = \Theta(2^{g(n)})$, allora $f(n) = \Theta(g(n))$
        2. Se $f(n) = O(g(n))$, allora $\sqrt{g(n)} = \Omega(\sqrt{f(n)})$
        3. Se $h(n) = \Theta(t(n))$ e $f(n)/h(n) = \Theta(g(n))$, allora $\frac{f^2(n)}{h(n) \cdot t(n)} = \Theta(g^2(n))$
        4. Se $f(n) = \Theta(n)$ e $g(n) = \Theta(2^{n^2})$, allora $2^{2 \cdot logf(n)} = \Theta(\log(g(n)))$
        5. Se f, g sono due funzioni asintoticamente positive e crescenti, allora $\log(f(n) \cdot g(n)) = O(\max\{\log(f(n)), \log(g(n))\})$
        6. Se $h^2(n) = \Theta(\min\{f(n), g(n)\})$, allora $\sqrt{f(n)} = O(h(n))$
        7. Se $\sqrt{h(n)} = O(\min\{f(n), g(n)\})$, allora $h(n) = O(g^2(n))$
        8. Se $2^{f(n)} = \Theta(g(n))$ e $g(n) = \Theta(h(n)^k)$ per una costante $k > 0$, allora $f(n) = \Theta(\log h(n))$
        9. Se $f(n) = \Theta(n)$ e $g(n) = \Theta(2^n)$, allora $2^{f(n)} = \Theta(g(n))$
        10. Se $\sqrt{h(n)} = O(2^{f(n)^{g(n)}})$, allora $\log(\log h(n)) = \Theta(g(n) \cdot \log f(n))$
        11. Se $h(n) = \Theta(\max\{\log\log f(n), \log\log g(n)\})$, allora $g(n) = O(2^{2^{h(n)}})$
        12. Se $z(n) = \Theta(2^{g(n)})$ e $h(n) = \Theta(\log g(n))$, allora $\log z(n) = \Theta(2^{h(n)})$
        13. Se $f(n) = \Theta(\sqrt{g(n)})$ e $2^{g(n)} = \Theta(2^n)$, allora $\log f(n) = \Theta(\log n)$
        14. Se $h(n) = \Theta(t(n))$ e $f(n) = \Theta(g(n))]$, allora $g(n) + h(n) = \Theta(t(n) + f(n))$
        15. Se $h(n) = \Theta(t(n))$ e $f(n) = \Theta(g(n))$, allora $\log_2(g(n) \cdot h(n)) = \Theta(\log_2(t(n) \cdot f(n)))$
        16. Se $\log \frac{f(n)}{g(n)} = \Theta(\log(t(n) \cdot g(n)))$ e $\log \frac{t(n)}{g(n)} = \Theta(\log \frac{h(n)}{f(n)})$, allora $\log h(n) = \Theta(\log t(n))$
        17. Se $f(n) = \Theta(\sqrt{g(n)})$ e $f(n) = \Theta(k^2(n))$, allora $g(n) = \Theta(k(n)^4)$
    2. Si trovino, se esistono, le costanti per soddifare la seguente relazione asintotica:
        1. $5n^2 - 8\sqrt{n} + 1 = \Theta(n^2)$
        2. $\log \frac{n}{7} = \Theta(\log n^4)$
        3. $4n^2 - 7\sqrt{n} + 2 = \Theta(n^2)$

4. $2n - \log \frac{n}{4} = \Theta(n)$
5. $2\log_2(n) - 4/n = \Theta(\log_2 n)$
6. $n - \log_2(n) + 1 = \Theta(n)$
7. $n^2 \log(n^2) + 15n^2 = \Theta(n^2 \log(n))$
8. $7n\sqrt{n} + 3n - 10\sqrt{n} = \Theta(n^{3/2})$
9. $\log_2(2^n \cdot \frac{4^n}{n}) = \Theta(\log_2(3^{3n}))$

- Link Forum
- Link Github