DOMANDA 1

$$T(n) = 4T\left(\frac{n}{2}\right) + n^2(n+1)$$

$$\log_b^a = \log_2^4 = 2$$

$$\lim_{n \to \infty} \frac{2}{n^2(n+1)} = \frac{1}{\infty} = 0 \qquad \oplus (n^2)$$

$$T(n) \leq Cn^2$$

$$T(n) = 4T\left(\frac{n}{2}\right) + n^2(n+1)$$

$$= 4\left(\frac{n}{2}\right)^2 + n^2(n+1)$$

$$= n^2 + n^3 + n^2 = n^3 + 2n^2 \sim \quad n^3 + 2n^2 \leq Cn^2$$

$$\frac{n^2(n+2)}{n^2} \leq \frac{Cn^2}{n^2} \qquad n+2 \leq C$$

$$T(n) \geq dn^2$$
$$T(n) = 4T\left(\frac{n}{2}\right) + n^2(n+1)$$
$$\geq 4\left(\frac{n}{2}\right)^2 + n^2(n+1)$$
$$\sim n^3 + 2n^2 \geq dn^2$$

$$\frac{n^2(n+2)}{n^2} \geq \frac{dn^2}{n^2} \qquad d \geq n+2$$
$$n \geq d-2$$

$$C \leq n+2$$
$$\to n \leq C-2$$

$$e.g. \quad C=3 \quad n=1$$

DOMANDA 2

$m = 8$

$h_1(k) = k \bmod m$

$h_2(k) = 1 + 2(k \bmod (m-1))$

K: 34, 12, 18, 23, 15

DOPPIO HASHING = $(h_1(k) + i \, h_2(k)) \bmod m$

DOVE i sta per "tentativo i-esimo"

$7 + 2(3) = 7 + 6 = 13 \bmod 8 = 5$

0	
1	
2	34
3	18
	12
4	15
5	
6	23
7	

$18 \bmod 8 = 2 \rightarrow h_1 k$

$2 + 1(1 + 2(18 \bmod 7))$

$2 + 1(1 + 2(4)) = 11 \bmod 8 = 3$

$23 \bmod 8 = 7 \rightarrow h_1 k$

$7 + 1(1 + 2(23 \bmod 7))$

$15 \bmod 8 \rightarrow 7$

$= 7 + 1(1 + 2(15 \bmod 7))$

$= 7 + 1(1 + 2(1))$

$= 7 + 3 = 10 \bmod 8 = 2 \;$ COLLISIONE

DOMANDA 3

INDICI: 1 2 3 4 5 6 7

VALORI:

2	4	4	7	8	8	8

FIRSTMAX (A, N)

IF (N == 1) RETURN A[1]

FOR I = 1 TO N
MAX = A[1]
IF (A[I] > MAX)
MAX = A[I]

RETURN MAX