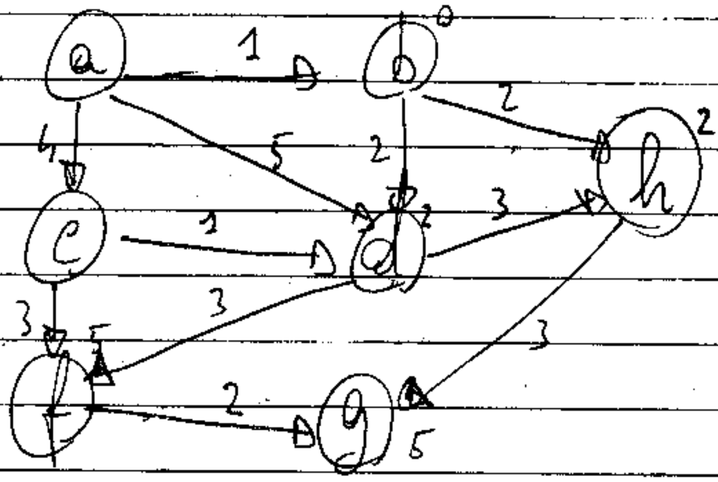
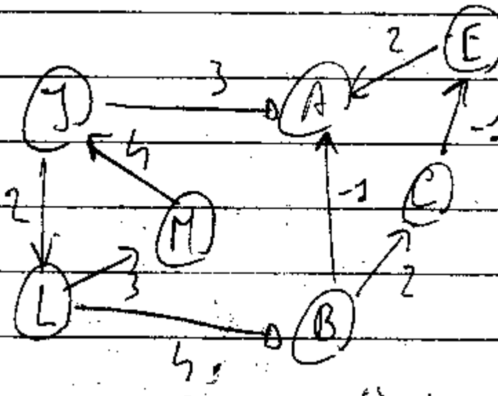
1-12 cammini minimi?



CODA A PRIORITÀ
(DIJSTRA)

| | | | | | | |
|---|---|---|---|---|---|---|
| a | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ |
| b | 0 | 0 | 0 | 0 | | |
| c | ∞ | ∞ | ∞ | ∞ | ∞ | ∞ |
| d | ∞ | 2 | 2 | 2 | | |
| f | ∞ | ∞ | 5 | 5 | | |
| g | ∞ | ∞ | ∞ | 5 | 5 | |
| h | ∞ | 2 | 2 | 2 | | |



PARTENDO DA J

ORDINE LESSICOGRAFICO

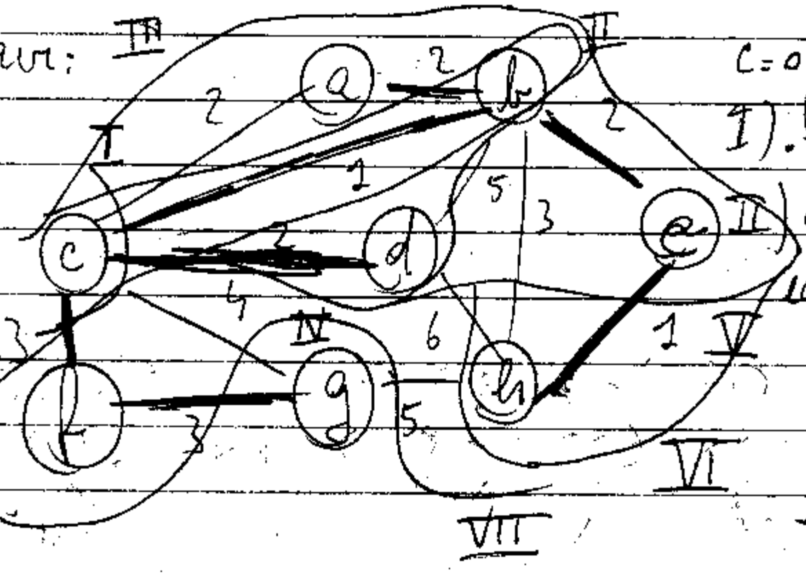
RICORSIONE SU TUTTI GLI ARCHI

B-A (-1)
B-C (2)
C-E (-1)
E-A (2)
J-A (3)
J-L (2)
L-B (4)
L-M (3)
M-J (4)

| | | $P_1$ | $P_2$ | $P_3$ |
|---|---|---|---|---|
| A | ∞ | 3 | 3 | 3 |
| B | ∞ | 6 | 6 | 6 |
| C | ∞ | ∞ | 8 | 8 |
| E | ∞ | ∞ | 7 | 7 |
| J | 0 | 0 | 0 | 0 |
| L | ∞ | 2 | 2 | 2 |
| M | ∞ | 5 | 5 | 5 |

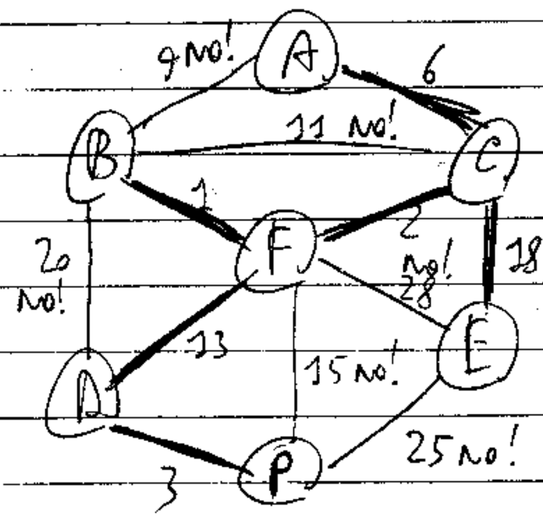
(BELLMAN)

ALGORITMO DI PRIM:



C = 0
I) b = 1
II) a = 3

# KRUSKAL




si prendono archi di peso crescente in modo che non introduciamo cicli

peso = 43

TABELLE DI HASH: dimens. 17 "CANICOLA" ordine alfabetico

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
| Q | R | S | T | U | V | W | X | Y | Z | | | | | | | |

open addressing con linear probing

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $A_1$ | $A_2$ | $C_1$ | $C_2$ | | | | | | I | | L | | N | O | |

$h(k) = (k \% M + i) \% M$

i = TENTATIVO

"APPELLOLAUREANDI" dim. 23 double hashing

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | L | | | E | | | | | $P_2$ | | L | | | O | $P_1$ | | | | $L_3$ | | |

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |

W X Y Z

| 19 | 20 | 21 | 22 |
|---|---|---|---|
| S | T | U | V |

$h(k) = [h_1(k) + i\, h_2(k)] \% M$

$h_1(k) = k \% M$ $\quad h_2(k) = 1 + k \% C$, $C = 19$

$$h^1(P) = [16 \% 23 + 1(1 + 16 \% 19)] \% 23 = 10$$

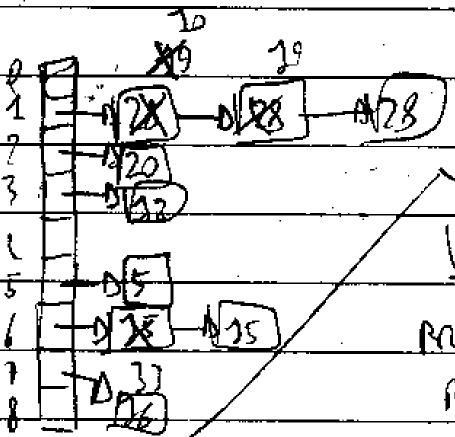
$$h^1(L) = [12 \% 23 + 1(1 + 12 \% 19)] \% 23 = 2$$

$$h^2(L) = [12 \% 23 + 2(1 + 12 \% 19)] \% 23 = [12 + 26] \% 23 = 15$$

$$h^3(L) = [12 \% 23 + 3(1 + 12 \% 19)] \% 23 = 51 \% 23 = 5 \qquad h^4(L) = 20$$

15
23

5 28 19 15 20 33 12 16 10   dim 9   linear probing




$h(k) = k \% M$   $M = 9$

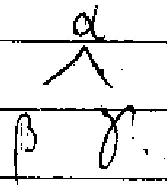
Le collisioni si gestiscono con una lista e si inserisce ~~in coda~~ in testa

VISITE ALBERI:

PRE-ORDER: 1 6 5 2 7 3 4 8 9

POST ORDER: 2 7 5 3 6 8 9 4 1

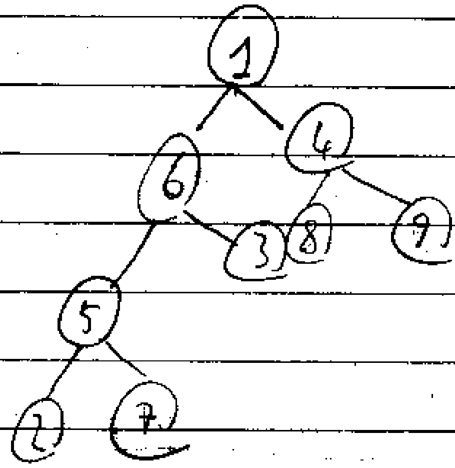
IN-ORDER: 2 5 7 6 3 1 8 4 9




PRE: $\alpha\ \beta\ \gamma$

IN: $\beta\ \alpha\ \gamma$

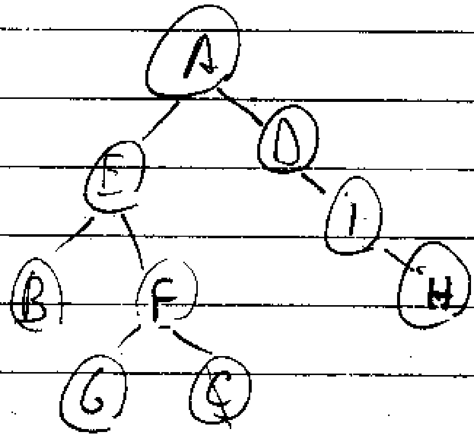
POST: $\beta\ \gamma\ \alpha$




PRE A E B F G C D I H

IN: B E G F C A D H I

POST B G C F E H I D A




unfolding:

$T(n) = 2T\left(\frac{n}{3}\right) + \frac{n}{3}$   $T(1) = 1$

$T\left(\frac{n}{3}\right) = 2T\left(\frac{n}{9}\right) + \frac{n}{9}$

$T\left(\frac{n}{9}\right) = 2T\left(\frac{n}{27}\right) + \frac{n}{27}$

$T(n) = 2\left(2T\left(\frac{n}{9}\right) + \frac{n}{9}\right) + \frac{n}{3} =$

$= 2\left[2\left(2T\left(\frac{n}{27}\right) + \frac{n}{27}\right) + \frac{n}{9}\right] + \frac{n}{3}$

$= 8T\left(\frac{n}{27}\right) + \underbrace{\frac{4}{27}n}_{i=2} + \underbrace{\frac{2}{9}n}_{i=1} + \underbrace{\frac{n}{3}}_{i=0} = \sum_{i=0}^{\log_3 n} \frac{1}{3} \cdot \frac{2^i}{3^i} n$

$M: \frac{n}{3^i} = 1$   $i = \log_3 n = M$

$$\sum_{i=0}^{M} x^i = \begin{cases} x<1 & \frac{1-x^{M+1}}{1-x} < \frac{1}{1-x} = cost. \\ 1 & M+1 \\ > & \frac{x^{M+1}-1}{x-1} \propto x^M \end{cases}$$

$$\frac{2}{3} < 1 \to n \sum_{i=0}^{\log_3 n} \left(\frac{2}{3}\right)^i \quad cost.$$

$$T(n) = O(n)$$

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

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

$$T\left(\frac{n}{4}\right) = 4T\left(\frac{n}{8}\right) + \frac{n^2}{16}$$

$$T(n) = 4\left[4\left(4T\left(\frac{n}{8}\right) + \frac{n^2}{16}\right) + \frac{n^2}{4}\right] + n^2 = 64T\left(\frac{n}{8}\right) + n^2 + n^2 + n^2 = 3n^2 + 64T\left(\frac{n}{8}\right) = \sum_{i=0}^{\log_2 n} 1^i \cdot n^2 =$$

$$M: \frac{n}{2^i} = 1; \quad M = i = \log_2 n$$

$$= n^2 \sum_{i=0}^{\log_2 n} 1^i = O(n^2 \log_2 n)$$

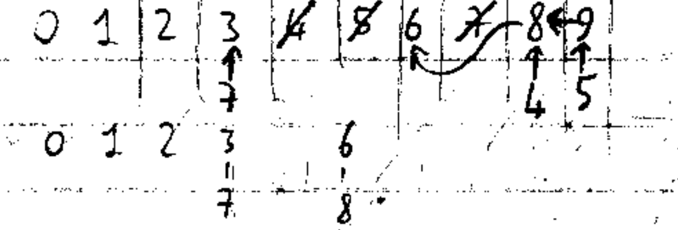
ONLINE CONNECTIVITY: QUICK FIND

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| (4,8) → | 0 | 1 | 2 | 3 | 8 | 5 | 6 | 7 | 8 | 9 |
| (7,3) → | 0 | 1 | 2 | 3 | 8 | 5 | 6 | 3 | 8 | 9 |
| (5,9) → | 0 | 1 | 2 | 3 | 8 | 9 | 6 | 3 | 8 | 9 |
| (2,9) → | 0 | 1 | 9 | 3 | 8 | 9 | 6 | 3 | 8 | 9 |
| (5,6) → | 0 | 1 | 6 | 3 | 8 | 6 | 6 | 3 | 8 | 6 |
| (8,0) → | 0 | 1 | 6 | 3 | 0 | 6 | 6 | 3 | 0 | 6 |

0 1 3 6
4 8 7 2 5 9

QUICK-UNION

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| (4,8) | 0 | 1 | 2 | 3 | 8 | 5 | 6 | 7 | 8 | 9 |
| (7,3) | 0 | 1 | 2 | 3 | 8 | 5 | 6 | 3 | 8 | 9 |
| (5,9) | 0 | 1 | 2 | 3 | 8 | 9 | 6 | 3 | 8 | 9 |
| (9,4) | | 1 | 2 | 3 | 8 | 9 | 6 | 3 | 8 | 8 |
| (5,6) | 0 | 1 | 2 | 3 | 8 | 9 | 6 | 3 | 6 | 8 |



QUICK-FIND: