RAPPRESENTAZIONE di NUMERI ed INSIEME dei NUMERI di MACCHINA

DOMANDA 1

$F(2, 5, m, M)$

$(2.23)_{10} \longrightarrow (10)_2 + (0.23)_{10}$

0.46

0.92

1.82

1.64

1.28

0.56

1.12

$(2.23)_{10} \rightarrow (10.00111101\ldots)_2$

troncamento:

$2^2(0.10001)$

DOMANDA 2

arrotondamento

$(10.00111101\ldots)_2 \longrightarrow$

$2^2(0.10010)$

DOMANDA 3

$F = F(2,6,4,4)$

w, Ω minimo e massimo numero positivo

N, Λ intero positivo

w?

$$w = 2^{-m-1} = 2^{-5}$$

DOMANDA 4

Ω ?

$$\Omega = \beta^M(1-\beta^{-t}) = 2^4(1-2^{-6})$$

$$= 2^4 - 2^{-2}$$

DOMANDA 5

$\omega\Omega > z^{-1}$? no

$z^{-5}(z^4 - z^{-2}) = z^{-1} - z^{-9} < z^{-1}$

DOMANDA 6

$\mu < 1$? no, per definizione $\mu \in \mathbb{Z}^+$.

DOMANDA 7

$\Lambda \geq 2^3$? sì

$\Omega = 16 \cdot 1/4 > 2^3$

$15 \in F$?

$(15)_{10} = (00111)_2 \in F$

quindi $\Lambda \geq 2^3$

DOMANDA 8

$\Lambda = 15$, quindi è dispari

DOMANDA 9

$$\Lambda = \sum_{k=0}^{3} 2^k \; ? \qquad \text{sì}$$

$$\Lambda = 2^4 \sum_{k=1}^{4} \left(2^{-k}\right) = (15)_{10} .$$

DOMANDA 10

$$\omega\Lambda > 2^{-2} \; ?$$

$$2^{-5} \cdot 15 > 2^{-2} \; ?$$

$$15 > 2^3 \; ? \qquad \text{sì}$$

DOMANDA 11

$$\#F^+ = 218 \; ? \qquad \text{no}$$

$$\#F^+ = (m_+ M_{+1})(\beta^+ - \beta^{+-1}) =$$

$$= 9 \cdot 32 = 288$$

DOMANDA 12

$$x_0 = 3, \quad x_{i+1} = \left(x_i + \frac{5}{x_i}\right)\frac{1}{2}$$

$$F = F(2, 4, m, M)$$

troncamento

$$\tilde{x}_0 = 3 = (11)_2$$

$$\tilde{x}_1 = (\tilde{x}_0 \oplus 5 \oslash \tilde{x}_0) \otimes 2$$

$$\frac{5}{3} = 1 + \frac{2}{3}, \quad \left(\frac{2}{3}\right)_{10} = 0.\overline{10}$$

$$\Rightarrow 5 \oslash 3 = (1.01)_2 =$$

$$= 2(0.101) = \frac{13}{8}$$

$$\rightarrow \tilde{x}_1 = \left(3 \oplus \frac{13}{8}\right) \otimes 2$$

$$\Rightarrow \left(3 \oplus \frac{13}{8}\right) = \text{trunc}\left(\frac{24+13}{8}\right) =$$

$$= \text{trunc}\left(\frac{37}{8}\right) = \text{trunc}\left(4 + \frac{1}{2} + \frac{1}{8}\right) =$$

$$= \text{trunc}(100 + 0.1 + 0.01) =$$

$$= \text{trunc}(2^3\, 0.100101) =$$

$$= 2^3(0.1001) = 8\left(\frac{1}{2} + \frac{1}{16}\right) =$$

$$= \frac{9}{2}$$

$$\Rightarrow \tilde{x}_1 = \frac{9}{2} \oslash 2 = \frac{9}{4} = (10.01)_2$$

DOMANDA 13

$\tilde{x}_1 = \text{trunc}(x_1)$? sì

$$x_1 = \left(3 + \frac{5}{3}\right) \cdot \frac{1}{2} = \frac{7}{3} = (10.\overline{01})_2$$

DOMANDA 14

$\tilde{x}_1 < \sqrt{5}$? no

2.25 2.23

DOMANDA 15

$\tilde{x}_2 = (1.001)_2$? no

$$\tilde{x}_2 = (\tilde{x}_1 \oplus 5 \oslash \tilde{x}_1) \oslash 2$$

$$\downarrow$$

$$5 \oslash \frac{9}{4} =$$

$$= \text{trunc}\left(\frac{5 \cdot 4}{9}\right) = \text{trunc}\left(2 + \frac{2}{9}\right) =$$

10 ↙ ↘ 0.001

$$= (10.00)_2 = 2$$

$$\downarrow$$

$$\left(\frac{9}{4} \oplus 2\right) = \text{trunc}\left(\frac{9}{4} + 2\right) =$$

$$= \text{trunc}\left(\frac{17}{4}\right) = \text{trunc}\left(4 + \frac{1}{4}\right) =$$

$$= \text{trunc}(100.01) = 100 = 4$$

$$\tilde{x}_2 = 4 \oslash 2 = 2$$

DOMANDA 16

$\tilde{x}_2 < \sqrt{5}$? sì

DOMANDA 17

$\tilde{x}_2 < \tilde{x}_1$? sì

DOMANDA 18

$\tilde{x}_3 < \tilde{x}_2$? no

$$\tilde{x}_3 = (\tilde{x}_2 \oplus 5 \oslash \tilde{x}_2) \oslash \tilde{x}_2$$

$$\downarrow$$

$$5 \oslash 2 =$$

$$\text{trunc}\left(\frac{5}{2}\right) = \text{trunc}\left(2 + \frac{1}{2}\right) = (10.1)_2$$

$$2 \oplus \frac{5}{2} = \text{trunc}\left(2 + \frac{5}{2}\right) =$$

$$\text{trunc}\left(\frac{9}{4}\right) = (10.01)_2$$

$$\tilde{x}_3 = 2.25$$

DOMANDA 19

$\tilde{x}_3 = \tilde{x}_1$? sì

DOMANDA 20

$\sqrt{5} < \tilde{x}_{i+1} < \tilde{x}_i$? no.