1.) Pogreške u postupcima analize

1.1)

24, 25

$24 = 11000 = 2^4 \cdot 1.1$

$25 = 11001 = 2^4 \cdot 1.\underbrace{1001}_{4} \rightarrow p = 4$

$k = 4$ $a = 2^{4-1} - 1 = 7$

$15.5 = 1111.1$ $\rightarrow 2^3 \cdot 1.1111$ $e - a = 3, e = 10$

$0,75 = 0.11$ $\rightarrow 2^{-1} \cdot 1.1$ $e - a = -1, e = 6$

$15.5 = 0\;1010\;1111$

$0.75 = 0\;0110\;1000$

$\begin{array}{r} 2^3 \cdot 1.1111 \\ + \; 2^3 \cdot 0.00011 \\ \hline 10.0000 \end{array} = 16$

1.2)

9, -0,1875

$9 = 1001$ $= 2^3 \cdot 1.001$ $\rightarrow p = 3$

$-0,1875 = -0.0011$ $= -2^{-3} \cdot 1.1$

$k = 3$ bit $\rightarrow e = 110 = 6$, $a = 3$, $exp \in \{3, 2, 1, 0, -1, -2\}$

$-0,1875$ kao denormirani: $-2^{-2} \cdot 0.11$, $k = 3\;\checkmark$

$9 = 0\;110\;001$

$-0,1875 = 1\;000\;110$

$\begin{array}{r} 2^3 \cdot 1.001 \\ - \; 2^3 \cdot 0.0000011 \\ \hline 2^3 \cdot 1.001 \end{array} = 9$

Bez greške frakcija mora biti 7 (zbog $0.\underbrace{0000011}_{7}$)

min = $0\;000\;000 \rightarrow 0$

max = $0\;110\;111 \rightarrow 2^3 \cdot 1.111 \rightarrow 15$

Ne može 111 jer bi (po tablici) to bio NaN

1.3)

$k=4$, $p=4$, $1\,000\,0\underset{e}{:}1100$

$e = 0\,0\,0\,0 \rightarrow$ denormirani! $\rightarrow -2^{1-2} \cdot 0.11$

$$= -2^{-6} \cdot 0.75 = -0.01171875 \,/\!/$$

1.4) $[-100, 100]$ $\quad q = 0.5 \quad -99, 4.5$

$100 = 1100100 = 2^6 \cdot 1.1001$

$k=4 \rightarrow e = \overline{1110}$, $a=7$, $\exp \in \{7, 6, \dots, -6\}$ ✓

$99 = 1100011 = 2^6 \cdot 1.100011$, $p=6 \,/\!/$
$98 = 1100010 = 2^6 \cdot 1.10001$

$4.5 = 100.1 = 2^2 \cdot 1.001$

$2^6 \cdot 1.100011$
$-2^6 \cdot 0.000100\underset{\cdot}{1}$ $\qquad \rightarrow$ može veći - manji i dodati predznak

$2^6 \cdot 1.011111 = -95 \,/\!/$

1.5)

$p=5$, $k=3$, $a=3$

a) $\min = 0\underset{\cdot}{:}000\underset{\cdot}{:}00001 \rightarrow 2^{-2} \cdot 2^{-5} = 2^{-7} \,/\!/$

$\max = 0\underset{\cdot}{:}110\underset{\cdot}{:}11111 \rightarrow 2^3 \cdot 1.11111 = 1111.11 = 15.75 \,/\!/$

b)

$0 = 0\underset{\cdot}{:}000\underset{\cdot}{:}00000$

$\infty = 0\underset{\cdot}{:}111\underset{\cdot}{:}00000$

c) $2^{a-p-1} = 2^{3-5-1} = 2^{-3} = 0.125 \,/\!/$

1.6)

$k=4$ $249,5$ $a=4$

$p=5$ -25.25 $e-a=exp$

$249.5 = 11111001.1 = 2^7 \cdot 1.11110011$

$-25.25 = 11001.01 = 2^4 \cdot 1.100101$

$249.5 = 0.1110 \; 1110$ (248) ✓

ili

11111 (252)

$-25.25 = 1.1011 \; 10010$ (25)   Mislim da bi trebalo

ili   biti svejedno ovdje

10011 (25.5) ✓

$2^7 \cdot 1.11110$

$-2^7 \cdot 0.00110010 1$

$= 2^7 \cdot 1.11000$ $=224$ //   Greška je 0.25 //

1.7)

$k=3$ $0.101 \; 1100$

$p=5$

$e=5$, $a=3$, $exp=5-3=2$

$2^2 \cdot 1.111 = 111.1 = 7.5$ //

1.8)

$k=3$ $(4.75+0.25)+10$ Ne vrijedi asocijativnost!

$p=4$ $4.75+(0.25+10)$

$4.75 = 100.11 = 2^2 \cdot 1.0011$

$0.25 = 0.01 = 2^0 \cdot 0.00.0,01$

$10 = 1010 = 2^3 \cdot 1.01$

I $4.75+0.25$ II $10+0.25$

$2^2 \cdot 1.0011$ $2^3 \cdot 1.0100$

$+ 2^2 \cdot 0.0001$ $+ 2^3 \cdot 0.00001$

$= 2^2 \cdot 1.0100 = 5$ // $= 2^3 \cdot 1.0100 = 10$ //

$10+5$ $10+4.75$

$2^3 \cdot 1.0100$ $2^3 \cdot 1.0100$

$+ 2^3 \cdot 0.1010$ $+ 2^3 \cdot 0.10011$

$2^3 \cdot 1.11100 = 15$ // $= 2^3 \cdot 1.1101 = 14.5$ //

Manja je greška ako se prvo zbrajaju "bliži" brojevi

1.9)

$[-10, 10]$ $a_p = 0,1$ $-9.9, \ 0.45$

$10 = 1010 = 2^3 \cdot 1.010$

$k = 3 // \ \rightarrow \ e = |110|, \ a = 3 , \ exp \in \{3,2,1,0,-1,-2\}$ ✓

$9.5 = 1001.1$ točno
$9.7 = 1001.11...... $ 0.05 greška
$9.6 = 1001.101..., $ 0.025 greška
$9.9 = 1001.111... $ 0.025 greška $= 2^3 \cdot 1.001111$

$p = 6//$

$0,45 = 0.011 = 2^{-2} \cdot 1.1$
greška $= 0,075$

$-9.9 = 1|110|001111$
$0,45 = 0|001|100000$

$\begin{array}{r} 2^3 \cdot 1.001111 \\ - \ 2^3 \cdot 0.000011 \\ \hline 2^3 \cdot 1.001100 \end{array}$ $= 1001.1 = -9.5$ $\rightarrow$ greška 0.05 ✓

Nadam se da je ovo točno!

1.10)

5.625 $0|1001|01101$

$5.625 = 101.101 = 2^2 \cdot 1.\underbrace{01101}$

$p = 5//$

$exp = 2$

$P = 01101$ pa je $e = 1001 = 9 \Rightarrow k = 4$

Provjera:

$k = 4 \rightarrow a = 7$ $e - a = exp$
                        $9 - 7 = 2$ ✓

.11)

$k=3$ 5.75 , -11

$p=4$ $z=3$

$5.75 = 101.11 = 2^2 \cdot 1.0111$

$-11 = -1011 = -2^3 \cdot 1.0110$

$5.75 = 0|101|0111$

$-11 = 1|110|0110$

$11 - 5.75$

$2^3 \cdot 1.0110$

$- 2^3 \cdot 0.10111$

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$2^3 \cdot 0.101.1 = 101.1 = 5.5$ //

1.12)

31.25 , 504 $9.5 , -25.25$

$31.25 = 11111.01 = 2^4 \cdot 1.111101$ $\}\, p=6$ //

$504 = 111111000 = 2^8 \cdot 1.11111$

30

$k=5$ // $\rightarrow z=15$, $e = 11110$, $\exp [15, -14]$ ✓

$-25.25 = -11001.01 = -2^4 \cdot 1.100101$

$9.5 = 1001.1 = 2^3 \cdot 1.0011$

$-25.5 = 1|10011|100101$

$9.5 = 0|10010|001100$

$25.25 - 9.5$

$2^4 \cdot 1.100101$

$- 2^4 \cdot 0.100110$

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$2^4 \cdot 0.111111$ $1111.11 = 15.75$ //

Opet, može veći – manji i dodat predznak