

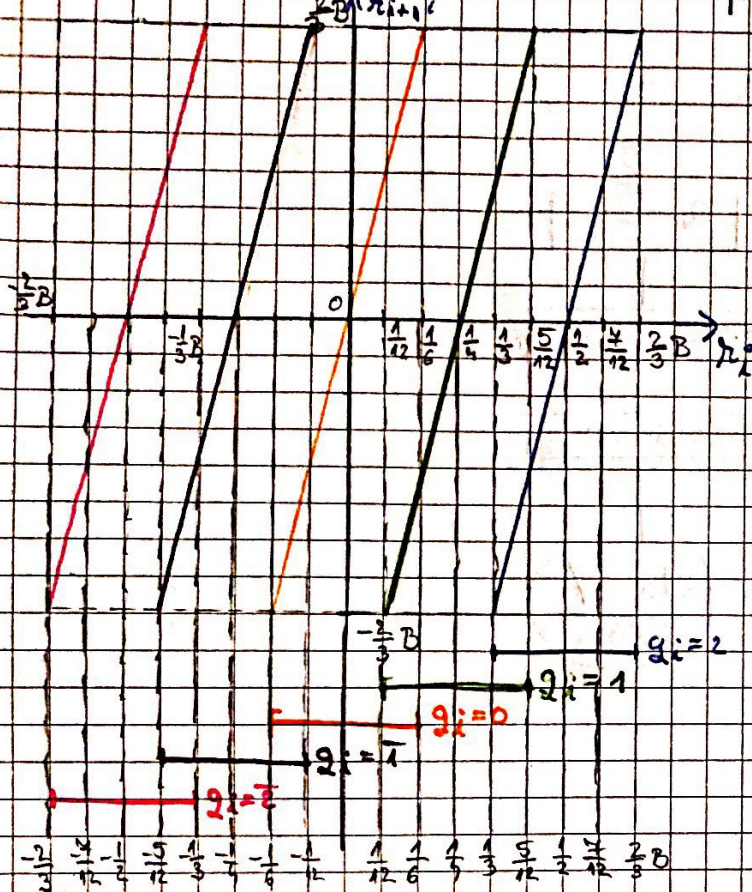
1.6. Radix-4 SRT

$$q_i \in [-2, -1, 0, 1, 2]$$

$$r_{i+1} = 4 \cdot r_i - q_i \cdot B$$

$$|r_i| < B \Rightarrow \text{Ne rezulta ca } |r_{i+1}| < B \Rightarrow$$

$$\Rightarrow \text{Trebuie sa tinem mereu } |r_i| < \frac{2}{3} B$$



$$q_i = 2 \Rightarrow r_{i+1} = 4r_i - 2B$$

$$q_i = 1 \Rightarrow r_{i+1} = 4r_i - B$$

$$q_i = 0 \Rightarrow r_{i+1} = 4r_i$$

$$q_i = -1 \Rightarrow r_{i+1} = 4r_i + B$$

$$q_i = -2 \Rightarrow r_{i+1} = 4r_i + 2B$$

• Codare radix 4:

$$\begin{array}{lll} 0 \rightarrow 00 & 1 \rightarrow 01 & 2 \rightarrow 10 \\ -1 \rightarrow 00 & -2 \rightarrow 01 \end{array}$$

• Exemplu în radix 4:

$$229 : 12 = 19 \text{ } r = 1$$

→ ne uităm la primii 6 biți ai lui P

COUNT	P	A	B
000	0 0 0 0 0 0 0 0 0	1 1 1 0 0 1 0 1	0 0 0 0 1 1 0 0
+1=	0 0 0 0 0 1 1 1 0	0 1 0 1 0 0 0 0	1 1 0 0 0 0 0 0
↳ ne aflăm în [-4, 3] ⇒ q _i = 0			
+4=	0 0 0 1 1 1 0 0	1 0 1 0 0 0 0 0	0 0 0 0 0 0 0 0
01	0 1 1 1 0 0 1 0	1 0 0 0 0 0 0 1	0 0 0 0 0 0 0 1
↳ [3, 9] ⇒ q _i = 1			
-1	1 1 0 0 0 0 0 0		
+4=	0 0 0 1 0 0 1 0		
10	0 1 0 0 1 0 1 0	0 0 0 1 1 1	
↳ [3, 9] ⇒ q _i = 1			
-1	1 1 0 0 0 0 0 0		
+4=	1 1 1 0 1 0 1 0		
↳ [-10, -4] ⇒ q _i = -1			
-1	1 0 1 0 1 0 0 0	0 1 1 1	
+1	1 0 0 0 0 0 0 0		
0000	0 0 0 0 1 0 0 0	Quotient:	
Shift	0 0 0 0 0 0 0 1		
Remainder = (1) ₁₀			
sau			
0.4 ³ + 1.4 ² + 1.4 ¹ - 1.4 ⁰ = 16 + 4 - 1 = (19) ₁₀			
sau			
00010100 -			
00000001			
100111 = (19) ₁₀			

Exemple SRT radix 4:

$$238 : 10 = 23 \quad r=8$$

$$B = 010100000$$

$$2B = 101000000$$

pt. ca restul a dat negativ

COUNT	P	A	B
00	0000000000	11101110	00001010
+1 =	000001110	11100000	10100000
	↳ [-4,3] => q _i =0		
+2 =	000111011	10000000	
01	↳ [3,9] => q _i =1		
	011101110	00000001	
	-101000000		
+9 =	001001110		
10	↳ [8,14] => q _i =2		
	100111000	0000102	
	-101000000		
	= 111111000		
	↳ q _i =0		
	111100000	00120	
CORR	+101000000		
	010000000		
Shift	000001000		

Remainder = (8)₁₀ de la corectie

$$\text{Quotient} : 2 \cdot 4^1 + 1 \cdot 4^2 - 1 = 8 + 16 - 1 = (23)_{10}$$

sau :

$$\begin{array}{r} 00011000 \\ 00000001 \\ \hline 00011001 \end{array}$$

$$00010111 = (23)_{10}$$

de la corectie (la ultima cifra se adauga 00 = -1)

Cap II. Performance in computer systems

1. Performance is hard to assess in computer systems
2. Producers tend to present their product in the best possible light
3. Design decisions are based on performance assessments.

A computer system with 1 processor:

A. we replace the processor with a faster one

B. we add more processors to our computer system

$$\text{User Response Time} \rightarrow \text{System Response Time}$$

Processor OS

$$\text{CPU time} = \text{No of clock cycles per program} \times \text{clock cycle time} =$$

$$= \text{Instructions count} \times \text{Clock cycles per instruction} \times \text{clock cycle time}$$

