$M = -11 = 1\ 1011_{SM} = 1\ 0101_{C_2}$; $-M = 0\ 1011$

$Q = 5 = 0\ 0101_{SM} = 00101_{C_2}$

COUNT	OVR	A	Q[5]	Q	F	M
000		00000 +	0	0 0101	0	10101
		10101				
		10101			0	
		11010	1	0 0010		
001		11101	0	1 0001	0	
		+10101				
010	1	10010			0	
		11001	0	0 1000		
011		11100	1	0 0100	0	
100		11110	0	1 0010		

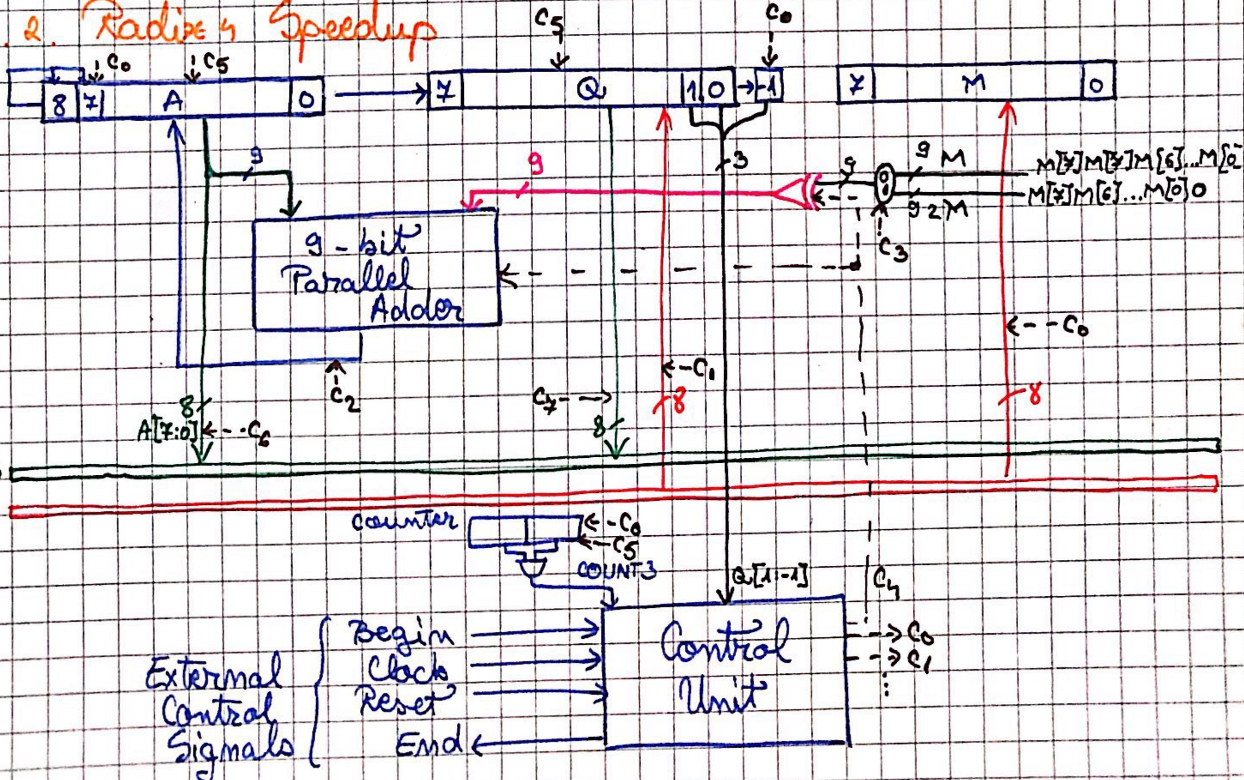
$1\ 1110\ 01001 = 1\ 000110111 = 1+2+4+16+32 =$

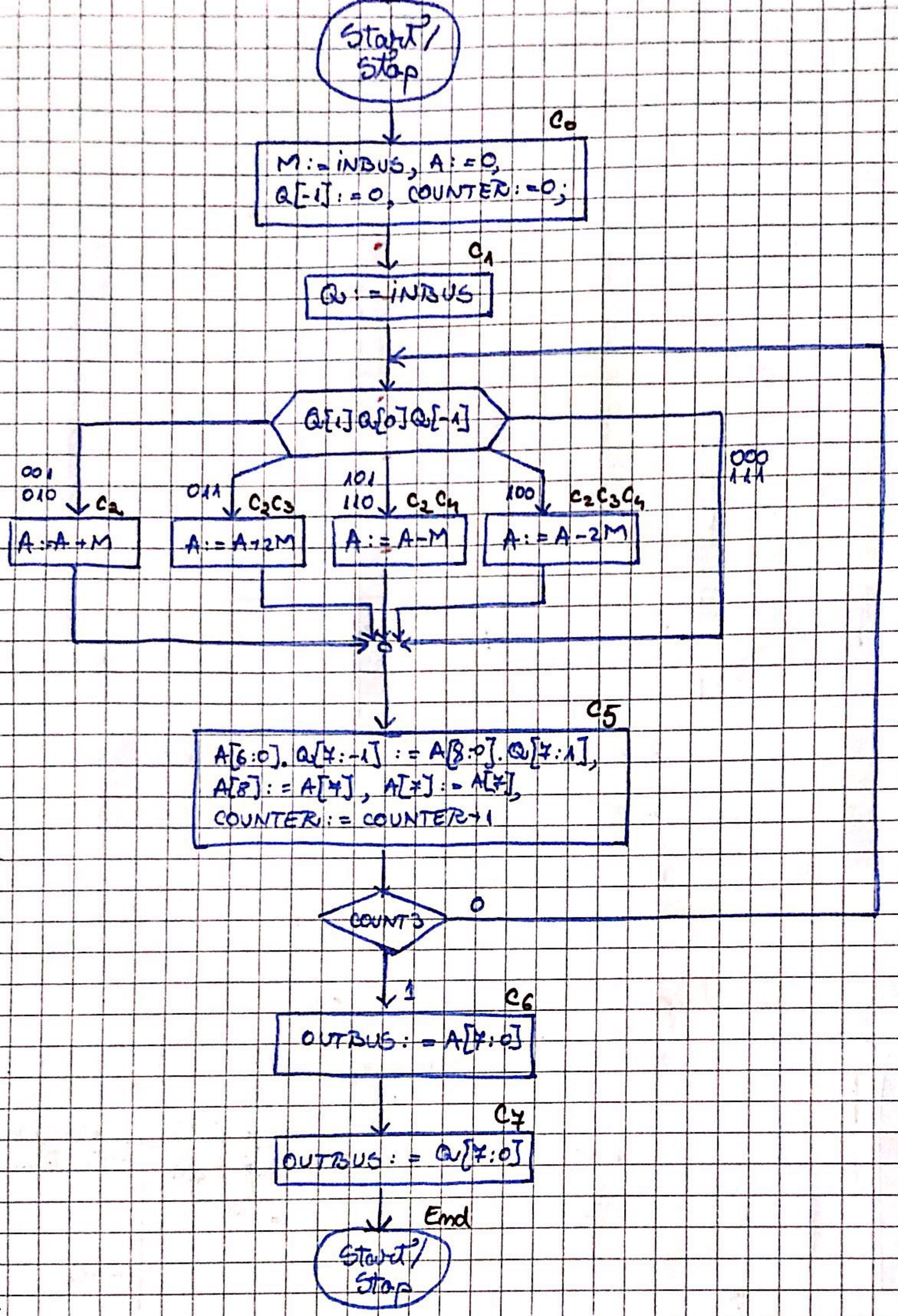
$= 3+20+32 = -55$

CURS 3

12.03.2019

1.2. Radix 4 Speedup





- Sinteza cu Sequence Counter a ordinogramei de mai sus

- <u>Exemplu</u>:

$X = -107 = 1110\ 1011_{SM} = 1\ 001\ 0101_{C_2}$

$Y = -92 = 1101\ 1100_{SM} = 1010\ 0100_{C_2}$

$P = -107 \times$

$\quad -92$

$\quad \overline{-214}$

$\quad 963$

$\quad \overline{9844}$

$M = 1\ 1001\ 0101$ (M pe 9 biți)

$-M = 00110\ 1011$

$2M = 10010\ 1010$

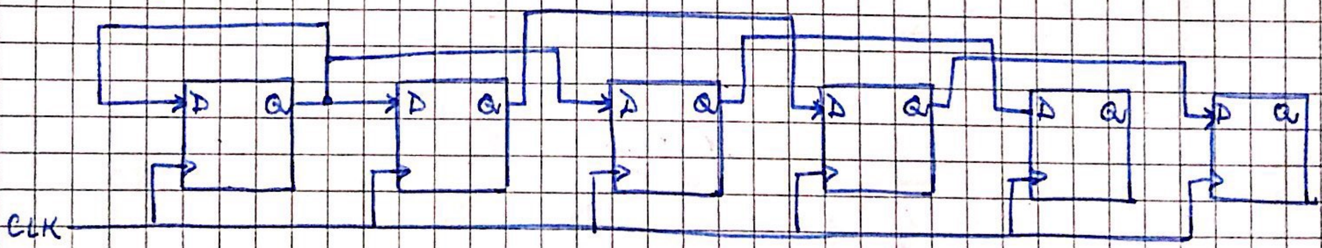
$-2M = 01101\ 0110$

COUNT	A	Q	Q[-1]	M
00	00000000 0000 0000	1010 01$\boxed{00}$ 0010 10$\boxed{01}$	$\boxed{0}$ $\boxed{0}$	1001 0101 ← shiftare dublă
01	+111001010 1 110010101 111100101	0100 10$\boxed{10}$	$\boxed{0}$ +M -2M	
10	+011010110 010111011 000101110	110100$\boxed{10}$	$\boxed{1}$ -M	
11	+001101011 010011001 $\boxed{000100110}$	$\boxed{01110100}$		

$P = 0010011001110100_{C_2 = SM} = +9844$

↑ nr. pozitiv

Shiftarea aritmetică:



~~1.3.~~

1.3. Radix – 8 Speedup

Q[2]	Q[1]	Q[0]	Q[-1]	Op
0	0	0	0	0
0	0	0	1	1
0	0	1	0	1
0	0	1	1	2
0	1	0	0	2
0	1	0	1	3
0	1	1	0	3
0	1	1	1	4
1	0	0	0	$\bar{4}$
1	0	0	1	$\bar{3}$
1	0	1	0	$\bar{3}$
1	0	1	1	$\bar{2}$
1	1	0	0	$\bar{2}$
1	1	0	1	$\bar{1}$
1	1	1	0	$\bar{1}$
1	1	1	1	0
	2^{i+2}	2^{i+1}	2^{i}	

$\rightarrow +M \cdot 2^i$

$\rightarrow -M \cdot 2^i + M \cdot 2^{i+1} = M \cdot 2^i$

$\rightarrow +M \cdot 2^{i+1} = 2M \cdot 2^i$

$\rightarrow -M \cdot 2^{i+1} + M \cdot 2^{i+2} = 2M \cdot 2^i$

$\rightarrow +M \cdot 2^i - M \cdot 2^{i+1} + M \cdot 2^{i+2} = 3M \cdot 2^i$

- Exemplu: Q și A e pe 10 biți. Pt exemplul anterior o să analizăm grupele: 1 1 0 1 0 0 1 0 0 0

CNT	A	Q[8]	Q	Q[-1]	M
00	00 0000 0000	1	1010 0 $\boxed{100}$	$\boxed{0}$	100101 01
+	01 1010 1100			$-4M$	
	01 1010 1100				
	00 0011 0101	1	0011 0 $\boxed{100}$	$\boxed{1}$	
01 +	01 0100 0001			$-3M$	
	01 0111 0110				
	00 0010 1110	1	1010 0 $\boxed{110}$	$\boxed{1}$	
10 +	00 0110 1011			$-M$	
	00 1001 1001				
	00 0 $\boxed{0010011}$	$\boxed{0}$	$\boxed{0111\ 0100}$	1	

Counter-ul merge până la nr. de grupe în care împărțim Q-ul.

Extindem M pe 10 biți:

M = 11 1001 0101

-M = 000 110 1011

2M = 11 00 10 1010

-2M = 0011 010110

3M = 101011 1111

-3M = 010100 0001

4M = 1001010100

-4M = 0110101100

1.4. Division Algorithms

5771 : 135 = 42 <=> Divident = Divisor * Quotient + Remainder

540

= 371

270

101

5771 = 101101 000 1011

135 =

1.4.1. Restoring Division (întregi fără semn)

COUNT	A	Q	M
000	0010 1101	0001 0110	1000 0111
	− 1000 0111		
	1010 0110	0001 0110	
	+ 1000 0111		
	0010 1101		
	010		

← shiftare la stânga