Lab 2
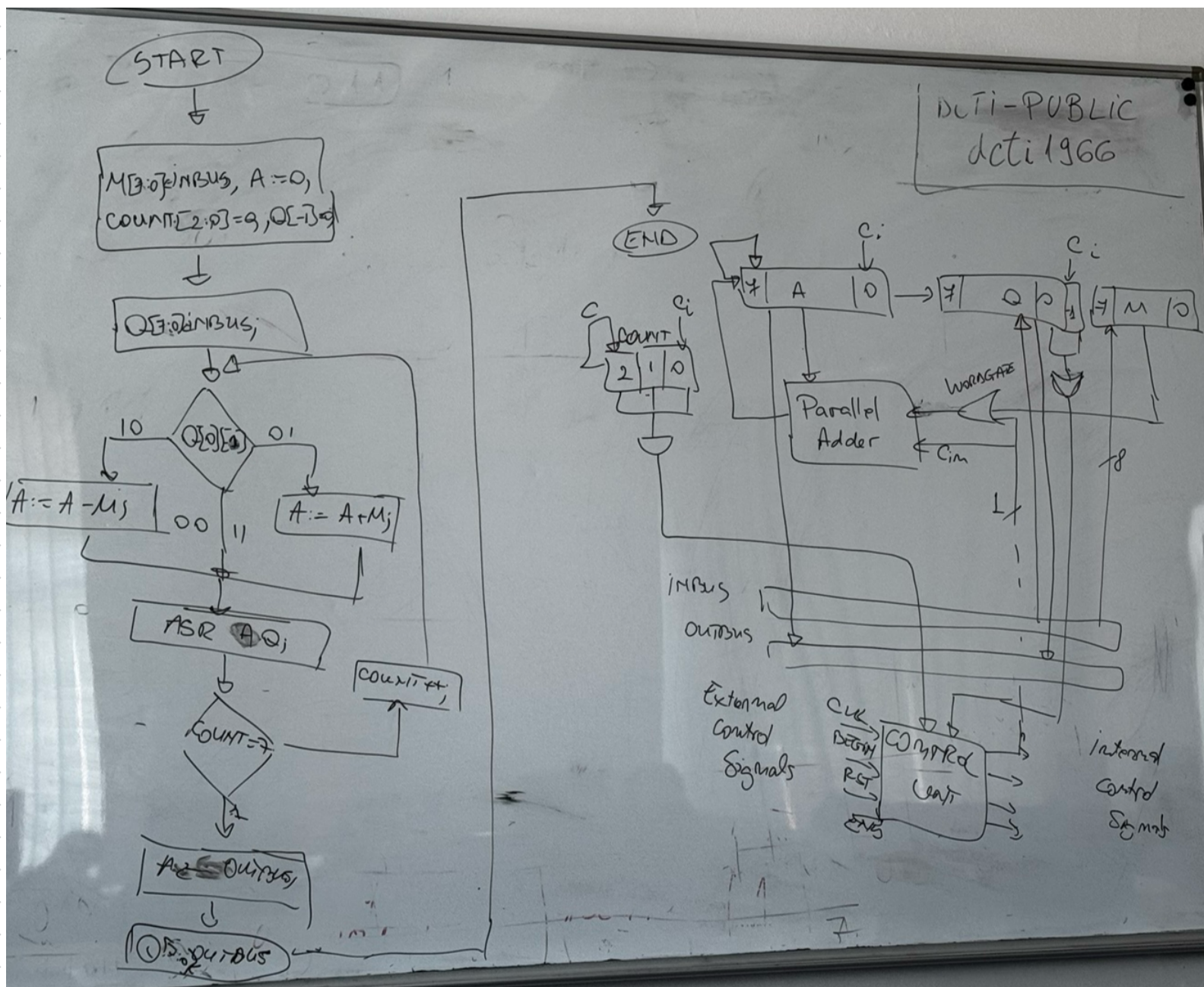
Booth Radix 2 — 8 bit C_2

B_{R_2} $\{0, 1, \bar{1}\}$ $\quad B_{R_4}$ $\{\bar{2}, \bar{1}, 0, \bar{1}, \bar{2}\}$

$X_{C_2} = 1000\ 0001 \qquad = -127$

$X_B = \bar{1}0000001\bar{1} \quad \rightarrow 3\ op.$

$X = -109$ $X_{c_2} = 1\,0010011$

$Y = -55$ $Y_{c_2} = 1\,1001001$

$-109 = -128 + 19$

$\underbrace{16+2+1}$ $-Y_{c_2} = 0011\,0111$

$-55 = -64 + \underset{\underbrace{8+1}}{9}$

CNT	A	Q	R-1	M
000	0000 0000 + 0011 0111 0011 011 1 0001 1101 1	1001 0011 1100 1001 1	0 -M 1	1100 1001
001	0000 1101 +11 00 1001 1101 0110 1110 1011	111 00 100 0111 0010	1 +M 0	
011	1111 1010 1	1011 1001	0 -M	
100	+0011 0111 0010 1100 0001 0110	 0101 1100	 1 +M	
101	+1100 1001 1101 1111 1110 1111	 1010 1110	 0	
110	1111 0111	1101 0111	0 -M	
111	+0011 0111 0010 1110 0001 0111	 0110 1011	 1	→ ERG

Te mā

- 117
- 99

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$$X = -117$$
$$Y = -99$$

$$-117 = -128 + 11 = -128 + 8 + 2 + 1$$
$$-99 = -128 + 29 = -128 + 16 + 8 + 4 + 1$$

$$X_{C_2} = 1000 1011$$
$$Y_{C_2} = 1001 1101$$
$$-Y_{C_2} = 0110 0011$$

$$X \cdot Y = 11583$$

CNT	A	Q	Q[-1]	M
000	0000 0000 +0110 0011 ———— 0110 0011 0011 0001	1000 1011 1100 0101	0 _(-M)_ 1	1001 1101
001	0001 1000	1110 0010	1 _(+M)_	
010	+1001 1101 1011 0101 1101 1010	 1111 0001	 0 _(-M)_	
011	+0110 0011 ———— 0011 1101 0001 1110	 1111 1000	 1 _(+M)_	
100	+1001 1101 1011 1011 1101 1101	 1111 1100	 0	
101	1110 1110	1111 1110	0	
110	1111 0111	0111 1111	0 _m_	
111	+0110 0011 ———— 0101 1010 0010 1101	 0011 1111	 1	

$$2^{13} + 2^{11} + 2^{10} + 2^9 + 32 + 16 + 15 = 11\,583$$