

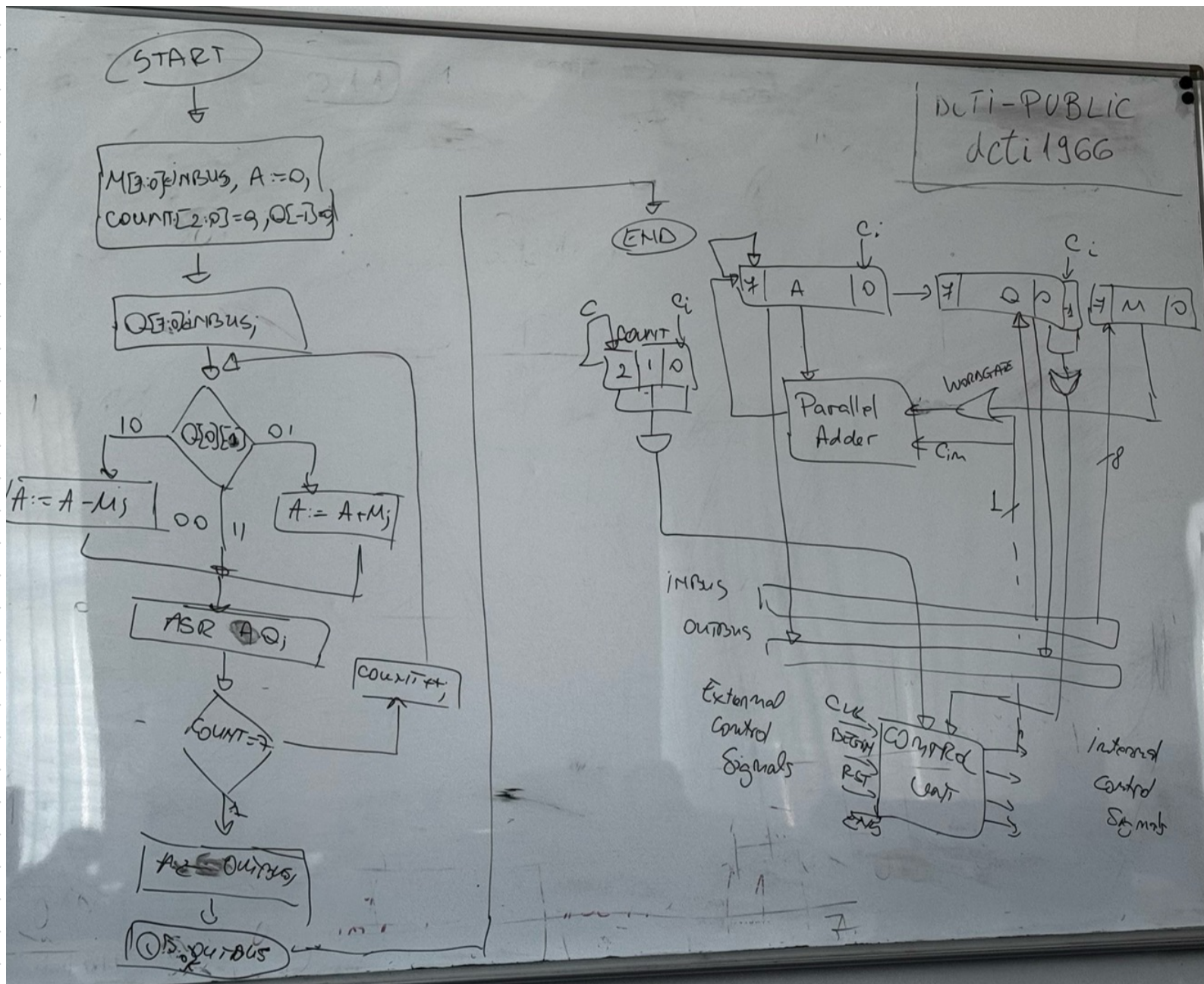
# Lab 2

## Booth Radix 2 - 8 bit $C_2$

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

$$X_{C_2} = 10000001 = -127$$

$$X_B = \bar{1}000001\bar{1} \rightarrow 3 \text{ op.}$$



$$X = -109$$

$$X_{C2} = 10010011$$

$$Y = -55$$

$$Y_{C2} = 11001001$$

$$-109 = -128 + 19$$

$$16 + 2 + 1$$

$$-Y_{C2} = 00110111$$

$$-55 = -64 + 9$$

$$8 + 1$$

CNT	A	Q	Q-1	M
000	$\begin{array}{r} 0000\ 0000 \\ + 0011\ 0111 \\ \hline 0011\ 0111 \\ 0001\ 1011 \end{array}$	$\begin{array}{r} 1001\ 0011 \\ 1100\ 1001 \end{array}$	$\begin{array}{r} 0 \\ 1 \end{array}$	1100 1001
001	$\begin{array}{r} 0000\ 1101 \\ + 1100\ 1001 \\ \hline 1101\ 0110 \\ 1110\ 1011 \end{array}$	$\begin{array}{r} 1110\ 0100 \\ 0111\ 0010 \end{array}$	$\begin{array}{r} 1 \\ 0 \end{array}$	
011	$\begin{array}{r} 1111\ 0101 \\ + 0011\ 0111 \\ \hline 0010\ 1100 \\ 0001\ 0110 \end{array}$	$\begin{array}{r} 1011\ 1001 \\ 0101\ 1100 \end{array}$	$\begin{array}{r} 0 \\ 1 \end{array}$	
101	$\begin{array}{r} + 1100\ 1001 \\ 1101\ 1111 \\ 1110\ 1111 \end{array}$	$1010\ 1110$	0	
110	$\begin{array}{r} 1111\ 0111 \\ 0010\ 1110 \end{array}$	$1101\ 0111$	0	
111	$\begin{array}{r} + 0011\ 0111 \\ 0010\ 1110 \\ 0001\ 0111 \end{array}$	$0110\ 1011$	1	→ ERR

Te mā

-117

-99

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$$X = -117$$

$$Y = -99$$

$$x \cdot y = 11583$$

$$-117 = -128 + 11 = -128 + 8 + 2 + 1$$

$$-99 = -128 + 29 = -128 + 16 + 8 + 4 + 1$$

$$X_{C2} = 10001011$$

$$Y_{C2} = 10011101$$

$$-Y_{C2} = 01100011$$

CNT	A	B	$Q[-1]$	M
000	$\begin{array}{r} 0000\ 0000 \\ + 0110\ 0011 \\ \hline 0110\ 0011 \\ 0011\ 0001 \end{array}$	$\begin{array}{r} 1\ 000\ 10\ 11 \\ 1\ 1\ 000\ 10\ 1 \end{array}$	$\begin{array}{r} 0 \\ -M \\ 1 \end{array}$	10011101
001	$\begin{array}{r} 0001\ 1000 \\ + 1001\ 1101 \\ \hline 1011\ 0101 \\ 1101\ 1010 \end{array}$	$\begin{array}{r} 1\ 11\ 000\ 10 \\ 1\ 11\ 1\ 000\ 1 \end{array}$	$\begin{array}{r} 1 \\ +M \\ 0 \\ -M \end{array}$	
010	$\begin{array}{r} + 1001\ 1101 \\ \hline 1011\ 0101 \\ 1101\ 1010 \end{array}$	$\begin{array}{r} 1\ 11\ 1\ 000\ 1 \\ 1\ 11\ 1\ 1\ 000\ 1 \end{array}$	$\begin{array}{r} 0 \\ -M \end{array}$	
011	$\begin{array}{r} + 0110\ 0011 \\ \hline 001\ 11101 \\ 0001\ 1110 \end{array}$	$\begin{array}{r} 1\ 111\ 1\ 000\ 1 \\ 1\ 111\ 1\ 1\ 000\ 1 \end{array}$	$\begin{array}{r} 1 \\ +M \end{array}$	
100	$\begin{array}{r} + 1001\ 1101 \\ \hline 1011\ 1011 \\ 1101\ 1101 \end{array}$	$\begin{array}{r} 1\ 111\ 1\ 1\ 100 \\ 1\ 111\ 1\ 1\ 100 \end{array}$	$\begin{array}{r} 0 \\ 0 \end{array}$	
101	$\begin{array}{r} 1110\ 1110 \\ + 0110\ 0011 \\ \hline 0101\ 1010 \\ 0010\ 1101 \end{array}$	$\begin{array}{r} 1\ 111\ 1\ 1\ 10 \\ 0011\ 1111 \end{array}$	$\begin{array}{r} 0 \\ 1 \end{array}$	
110	$\begin{array}{r} 1111\ 0111 \\ + 0110\ 0011 \\ \hline 0101\ 1010 \\ 0010\ 1101 \end{array}$	$\begin{array}{r} 0\ 111\ 1\ 1\ 11 \\ 0011\ 1111 \end{array}$	$\begin{array}{r} 0 \\ -M \end{array}$	
111	$\begin{array}{r} + 0110\ 0011 \\ \hline 0101\ 1010 \\ 0010\ 1101 \end{array}$	$\begin{array}{r} 0011\ 1111 \\ 0011\ 1111 \end{array}$	$\begin{array}{r} 1 \end{array}$	
$2^{13} + 2^{11} + 2^{10} + 2^9 + 32 + 16 + 15 = 11583$				