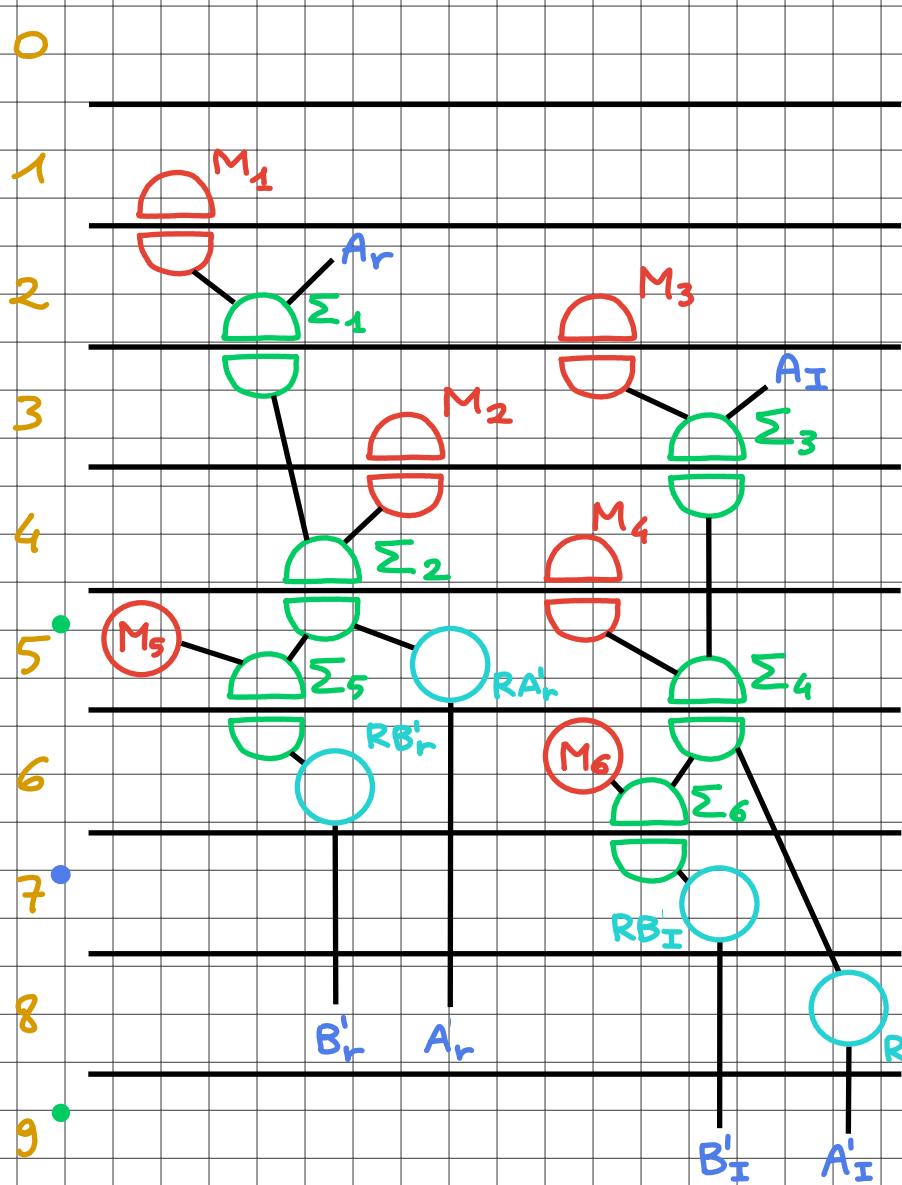


# BUTTERFLY DESIGN

## CONTROL DATA FLOW GRAPH



ESECUZIONE  
SINGOLA

LD\_RE

LD\_IM

SUM\_S1

SUM\_S3

SUM\_S2

SUM\_S4\_S5

SUM\_S6

RND\_BI

RDY\_RE

RDY\_IM

ESECUZIONE  
CONTINUA

LD\_RE

LD\_IM

SUM\_S1

SUM\_S3

SUM\_S2

SUM\_S4\_S5

SUM\_S6\_LD\_RE

RND\_BI\_LD\_IM

SUM\_S1

SUM\_S3

● ← CICLO SENSIBILE A START

● ← CICLO CHE FORNISCE DONE

12 STATI TOTALI

# CONTROL UNIT DESIGN

## DEFAULT VALUES

tutti i segnali a '0'

## LD\_RE

le(4)  
le(6)

## LD\_IM

le(5)  
le(7)

## SUM\_S1

sel\_int(2)  
le(2)  
sel\_mux3 = 2

## SUM\_S3

sel\_int(0)  
sel\_int(1)  
sel\_int(2)  
le(2)  
sel\_in  
sel\_out

## SUM\_S2

sel\_int(1)  
le(2)  
sel\_in  
sel\_mux2

## SUM\_S4\_S5 <- start

le(0)  
sel\_mux01  
sel\_mux2

## SUM\_S6

sel\_int(0)  
le(1)  
le(2)  
sel\_in  
sel\_mux01  
sel\_mux3

## RND\_BI -> done

le(3)  
sel\_mux3

## RDY\_RE

le(2)  
sel\_mux3 = 2

## RDY\_IM <- start

le(8)  
le(9)  
sel\_out

## SUM\_S6\_LD\_RE

sel\_int(0)  
le(1)  
le(2)  
sel\_in  
sel\_mux01  
sel\_mux3  
le(4)  
le(6)

## RND\_BI\_LD\_IM -> done

le(3)  
sel\_mux3  
le(5)  
le(7)

	I	II	III	IV	V	VI	VII	VIII	IX
Ar	0 4	0 5	0 4	0 5	0 4		0 4	0 4	0 4
Ai		0 5	0 5	0 5	0 5	0 5		0 5	0 5
B <sub>r</sub>	0 6	0 6				0 6	0 6		
B <sub>i</sub>		0 7	0 7	0 7			0 7	0 7	0 7
W <sub>r</sub>	0 8	0 8	0 8	0 8			0 8	0 8	0 8
W <sub>i</sub>	0 9	0 9	0 9				0 9	0 9	0 9
M <sub>1</sub>	0								
M <sub>2</sub>			0						
M <sub>3</sub>		0							
M <sub>4</sub>				0					
M <sub>5</sub>									
M <sub>6</sub>									
$\Sigma_1$		0	0 2						
$\Sigma_2$				0					
$\Sigma_3$			0	0 2					
$\Sigma_4$					0	0 2	0 2		
$\Sigma_5$					0				
$\Sigma_6$						0			
R <sub>A'</sub> <sub>r</sub>					0 0	0 0	0 0		
R <sub>B'</sub> <sub>r</sub>						0 1	0 1		
R <sub>A'</sub> <sub>I</sub>								0 3	0 3
R <sub>B'</sub> <sub>I</sub>								0 2	0 3

10 REGISTRI IN  
TOTALE NEL DF

# Operatori

$$M_1 = B_R W_R$$

$$M_2 = B_I W_I$$

$$M_3 = B_R W_I$$

$$M_4 = B_I W_R$$

$$M_5 = 2A_R$$

$$M_6 = 2A_I$$

$$\Sigma_1 = A_R + M_1$$

$$\Sigma_2 = \Sigma_1 - M_2 = A'_R$$

$$\Sigma_3 = A_I + M_3$$

$$\Sigma_4 = \Sigma_3 + M_4 = A'_I$$

$$\Sigma_5 = M_5 - \Sigma_2 = B'_R$$

$$\Sigma_6 = M_6 - \Sigma_4 = B'_I$$