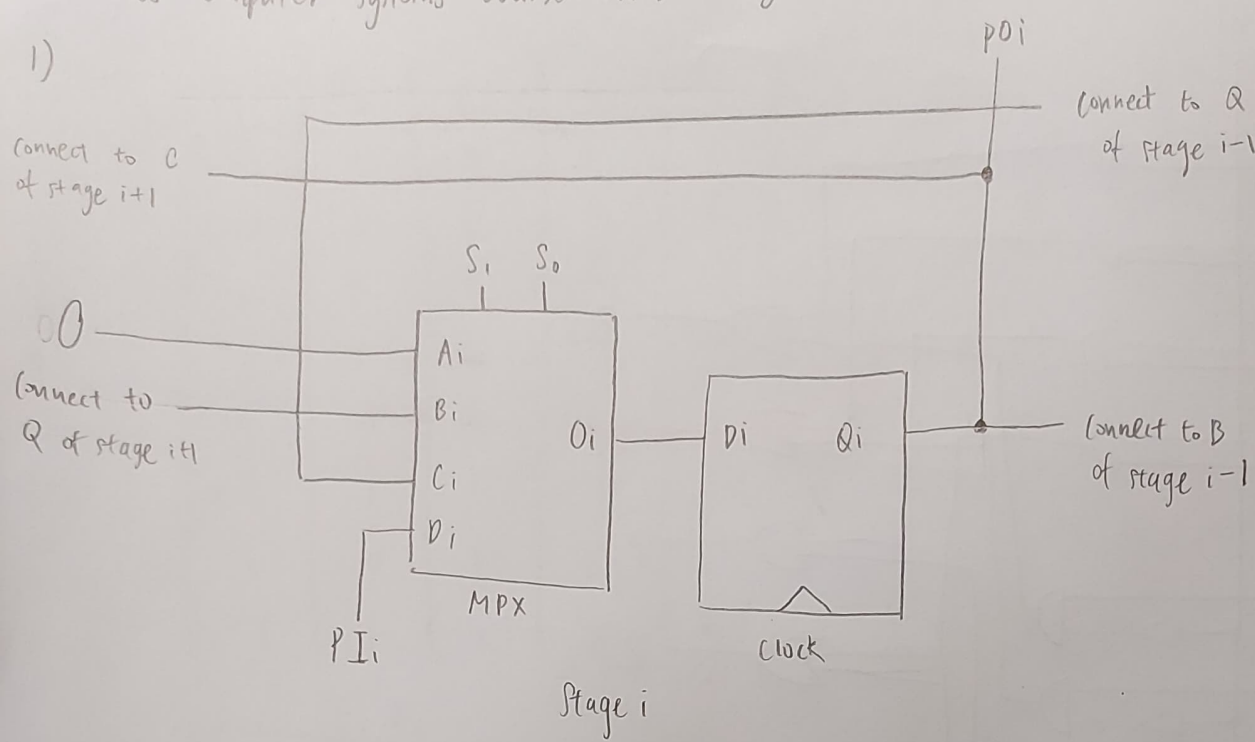


# Intro to computer systems coursework 3: Registers

1)



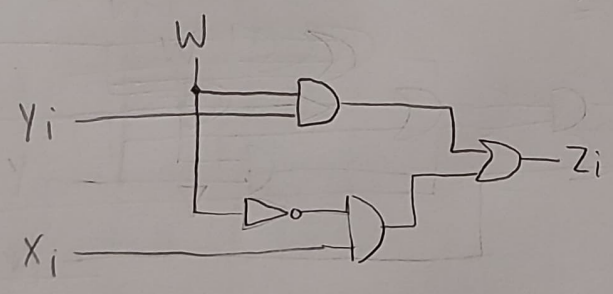
2)

W	$X_i$	$Y_i$	$Z_i$ (output)
0	0	0	0
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	0
1	1	1	1

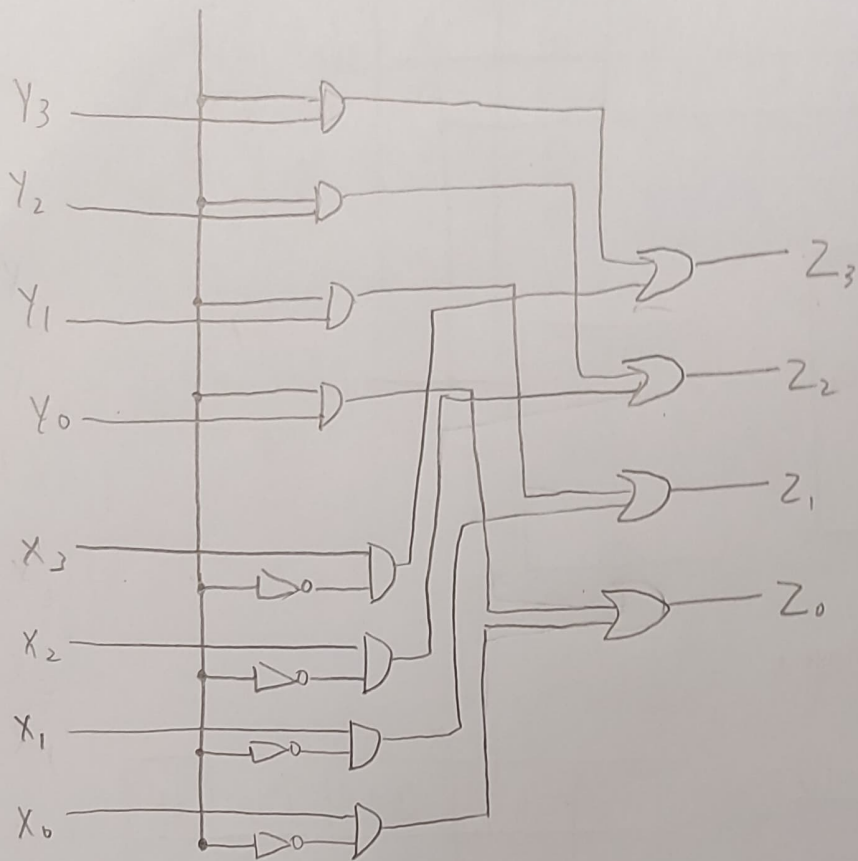
$X_i \ Y_i$

	00	01	11	10
0	0	0	1	1
1	0	1	1	0

$$Z_i = W' \cdot X_i + W \cdot Y_i$$



2) cont. 'Select' block circuit implementation:  
W



3)

$F_2$	$F_1$	$F_0$	$G_3$	$G_2$	$G_1$	$G_0$
0	0	0	X	0	0	X
0	0	1	X	0	1	1
0	1	0	X	1	0	1
0	1	1	1	1	1	1
1	0	0	0	1	1	1
1	0	1	1	1	1	1
1	1	0	1	1	1	1
1	1	1	X	X	X	0

$F_1 F_0$

	00	01	11	10
$F_2$ 0	X	X	1	X
$F_2$ 1	0	1	X	1

output:  $G_3$

$$G_3 = (F_2 \cdot F_1' \cdot F_0')' = F_2' + F_1 + F_0$$

$F_1 F_0$

	00	01	11	10
$F_2$ 0	0	0	1	1
$F_2$ 1	1	1	X	1

output:  $G_2$

$$G_2 = F_2 + F_1$$

$F_1 F_0$

	00	01	11	10
$F_2$ 0	0	1	1	0
$F_2$ 1	1	1	X	1

output:  $G_1$

$$G_1 = F_2 + F_0$$

$F_1 F_0$

	00	01	11	10
$F_2$ 0	1	1	1	1
$F_2$ 1	1	1	0	1

output:  $G_0$

$$G_0 = (F_2 \cdot F_1 \cdot F_0)'$$

3) cont.

'control' block circuit implementation:

