

CONJUNTO DE INSTRUÇÕES

INSTRUÇÃO	SIGNIFICADO
add \$1, \$2, \$3	$\$1 = \$2 + \$3$
sub \$1, \$2, \$3	$\$1 = \$2 - \$3$
beq \$1, \$2, NUMERO	if ($\$1 == \2) goto instrução NUMERO
bne \$1, \$2, NUMERO	if ($\$1 != \2) goto instrução NUMERO
j NUMERO	goto instrução NUMERO
lw \$1, VALOR(\$2)	$\$1 = \text{MEM}[\text{VALOR} + \$2]$
sw \$1, VALOR(\$2)	$\text{MEM}[\text{VALOR} + \$2] = \$1$

destino	fonte1	fonte2
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```
1. add $t0, $zero, $v0
2. add $t1, $t0, $t2
3. sub $s0, $t3, $t1
4. lw  $t4, 4($s0)
5. beq $s0, $t4, 9
6. add $t1, $t2, $t3
7. lw  $t0, 128($t1)
8. j 12
```

DENTRO:

```
9. sw $t8, 0($s8)
10. sub $t1, $t2, $t3
11. lw $t0, 8($s1)
```

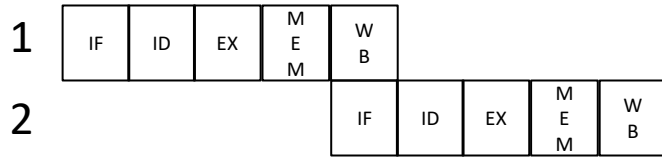
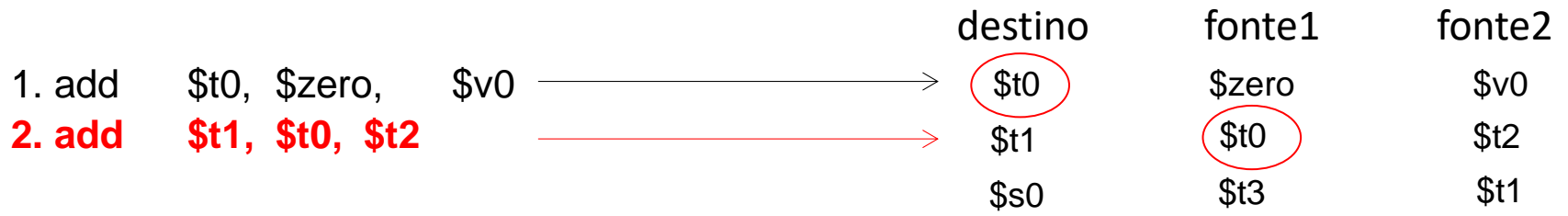
EXIT:

1. add \$t0, \$zero, \$v0 → destino fonte1 fonte2

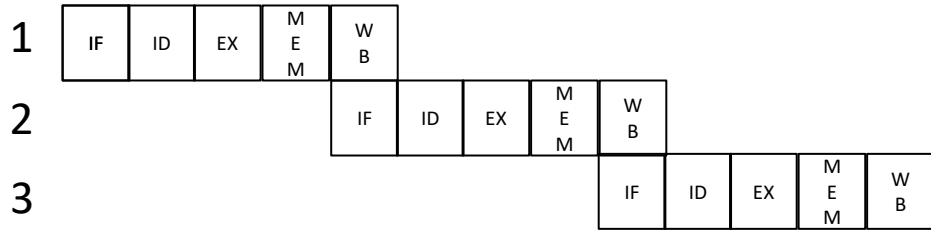
\$t0 \$zero \$v0

1

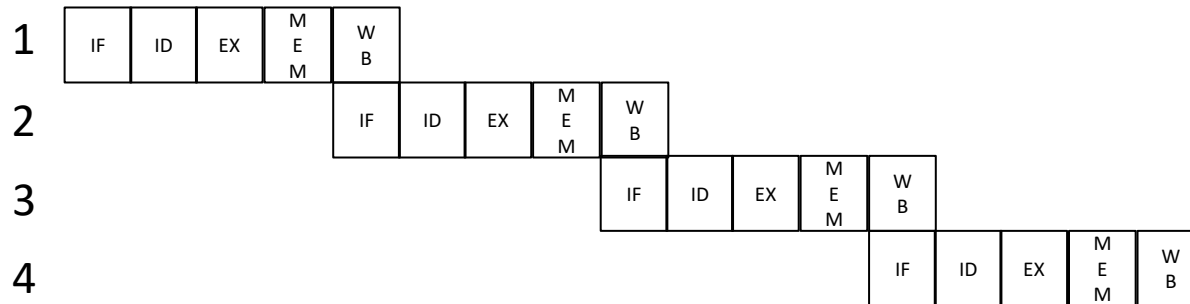
IF	ID	EX	M E M	W B
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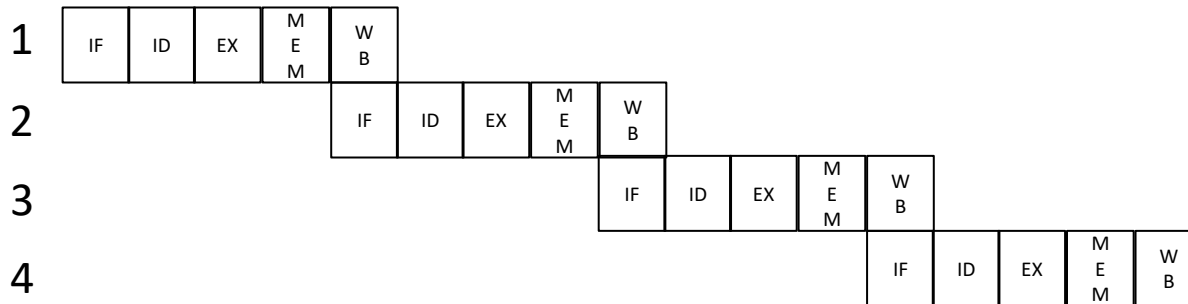
			destino	fonte1	fonte2
1. add	\$t0, \$zero,	\$v0	→ <u>\$t0</u>	\$zero	\$v0
2. add	\$t1, \$t0, \$t2		→ <u>\$t1</u>	<u>\$t0</u>	\$t2
3. sub	\$s0, \$t3, \$t1		→ \$s0	\$t3	<u>\$t1</u>



			destino	fonte1	fonte2
1. add	\$t0, \$zero,	\$v0	\$t0	\$zero	\$v0
2. add	\$t1, \$t0,	\$t2	\$t1	\$t0	\$t2
3. sub	\$s0, \$t3,	\$t1	\$s0	\$t3	\$t1
4. lw	\$t4, 4(\$s0)		\$t4	\$s0	

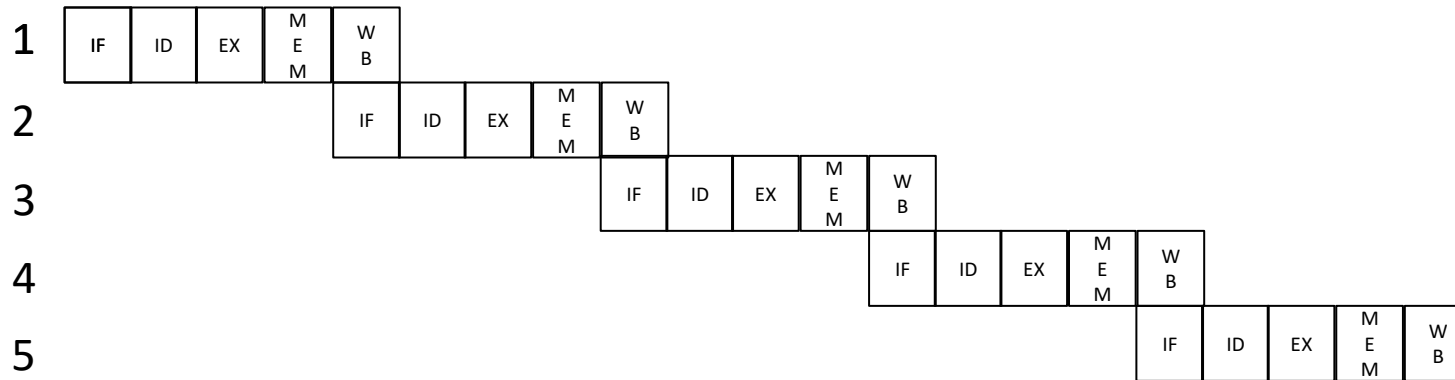


			destino	fonte1	fonte2
1. add	\$t0, \$zero,	\$v0	→ \$t0	\$zero	\$v0
2. add	\$t1, \$t0,	\$t2	→ \$t1	\$t0	\$t2
3. sub	\$s0, \$t3,	\$t1	→ \$s0	\$t3	\$t1
4. lw	\$t4, 4(\$s0)		→ \$t4	\$s0	

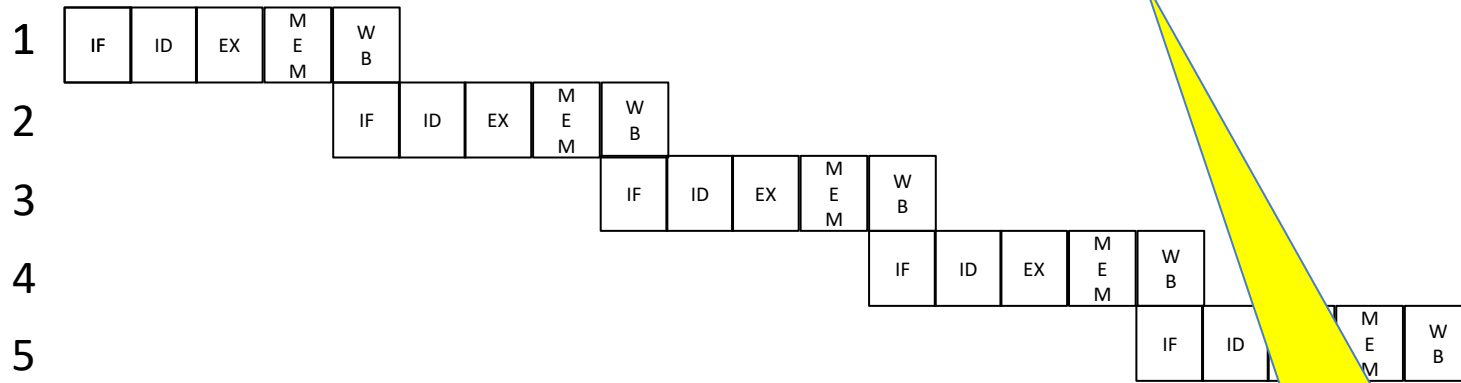


A fonte é a memória, porém, para saber o endereço de memória, é preciso ler o registrador \$s0

			destino	fonte1	fonte2
1. add	\$t0, \$zero,	\$v0	\$t0	\$zero	\$v0
2. add	\$t1, \$t0, \$t2		\$t1	\$t0	\$t2
3. sub	\$s0, \$t3, \$t1		\$s0	\$t3	\$t1
4. lw	\$t4, 4(\$s0)		\$t4	\$s0	
5. beq	\$s0, \$t4, 9		\$s0	\$t4	

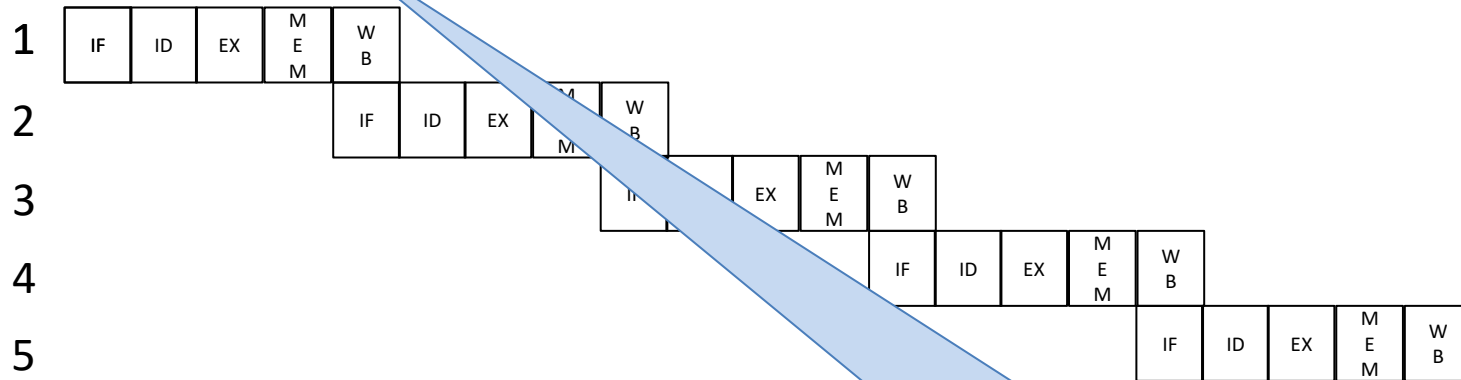


			destino	fonte1	fonte2
1. add	\$t0, \$zero,	\$v0	\$t0	\$zero	\$v0
2. add	\$t1, \$t0, \$t2		\$t1	\$t0	\$t2
3. sub	\$s0, \$t3, \$t1		\$s0	\$t3	\$t1
4. lw	\$t4, 4(\$s0)		\$t4	\$s0	
5. beq	\$s0, \$t4, 9		\$s0	\$t4	



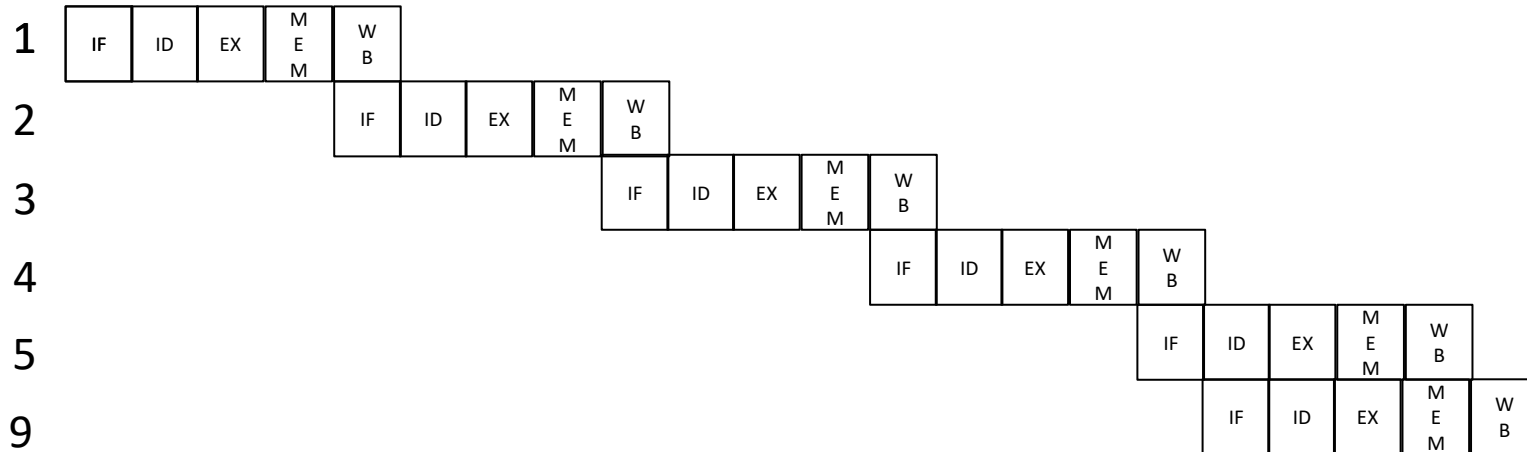
Existe uma dependência aqui mas não se manifesta como um conflito.

			destino	fonte1	fonte2
1. add	\$t0, \$zero,	\$v0	\$t0	\$zero	\$v0
2. add	\$t1, \$t0,	\$t2	\$t1	\$t0	\$t2
3. sub	\$s0, \$t3,	\$t1	\$s0	\$t3	\$t1
4. lw	\$t4, 4(\$s0)		\$t4	\$s0	
5. beq	\$s0, \$t4, 9		\$s0	\$t4	

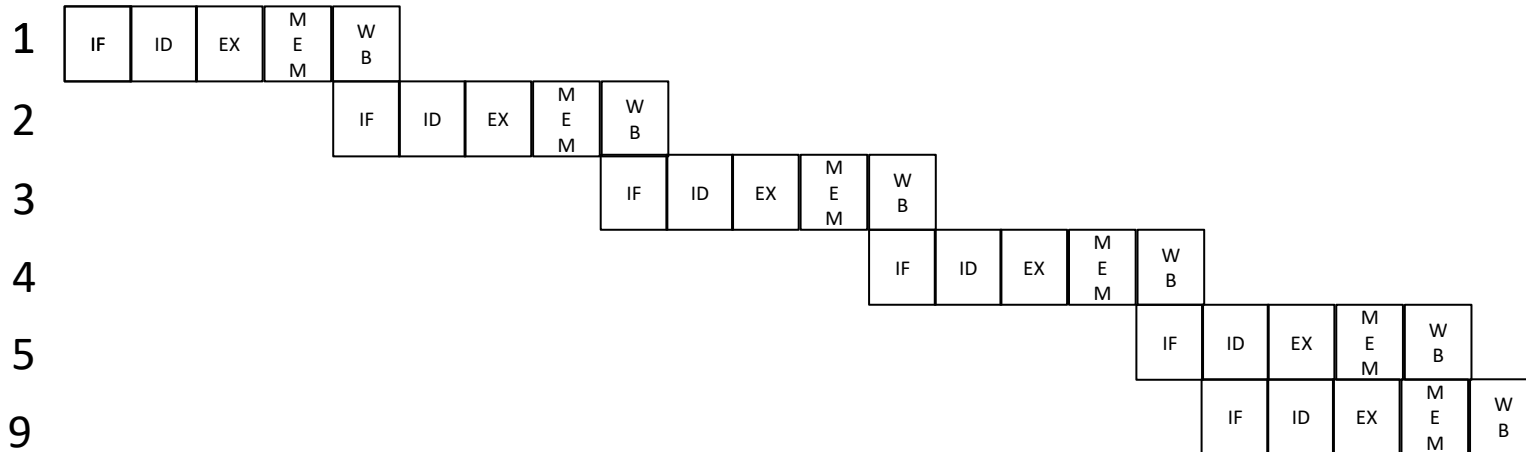


Instrução de salto:
automaticamente SALTAR para
a instrução apontada (no caso,
instrução 9) e NÃO executar as
instruções 6, 7 e 8.

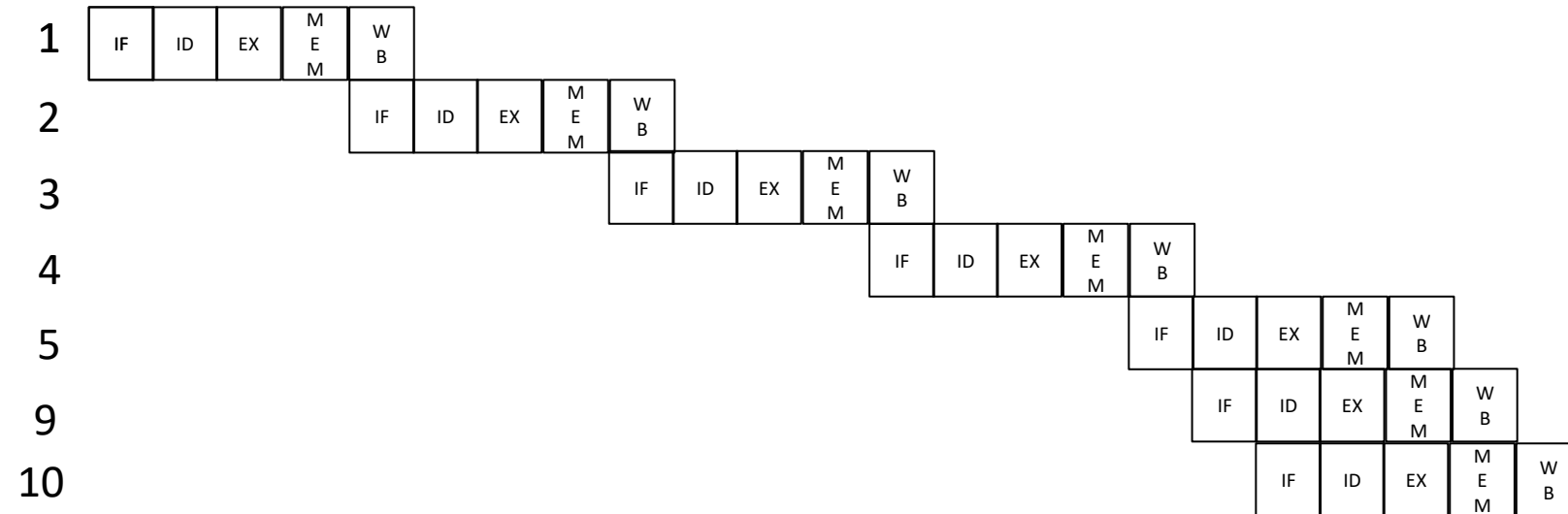
			destino	fonte1	fonte2
1. add	\$t0, \$zero,	\$v0	\$t0	\$zero	\$v0
2. add	\$t1, \$t0, \$t2		\$t1	\$t0	\$t2
3. sub	\$s0, \$t3, \$t1		\$s0	\$t3	\$t1
4. lw	\$t4, 4(\$s0)		\$t4	\$s0	
5. beq	\$s0, \$t4, 9		\$s0	\$t4	
9. sw	\$t8, 0(\$s8)		\$t8	\$s8	



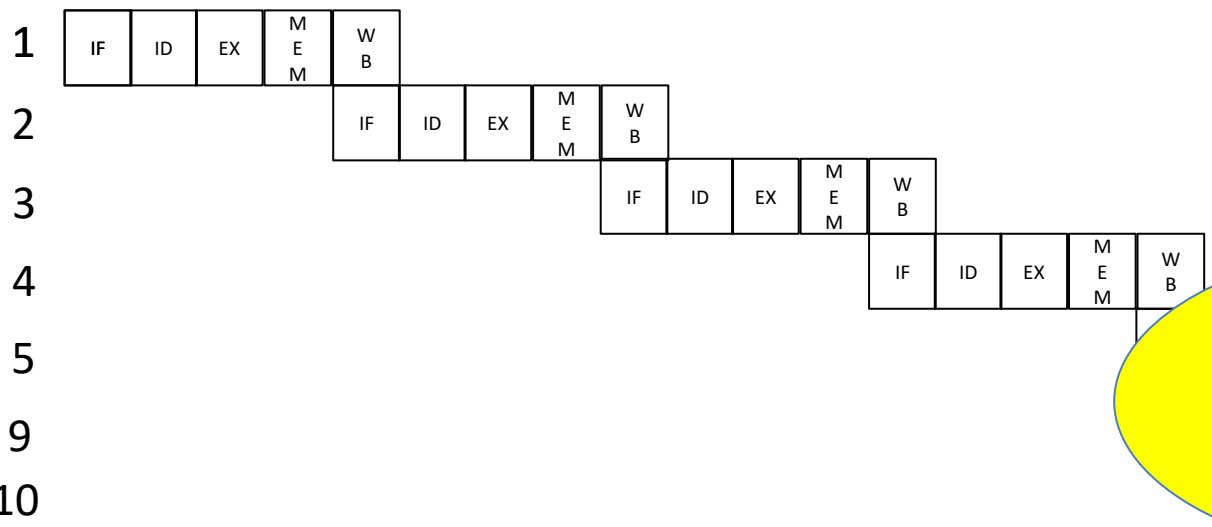
			destino	fonte1	fonte2
1. add	\$t0, \$zero,	\$v0	\$t0	\$zero	\$v0
2. add	\$t1, \$t0, \$t2		\$t1	\$t0	\$t2
3. sub	\$s0, \$t3, \$t1		\$s0	\$t3	\$t1
4. lw	\$t4, 4(\$s0)		\$t4	\$s0	
5. beq	\$s0, \$t4, 9		\$s0	\$t4	
9. sw	\$t8, 0(\$s8)		\$t8	\$s8	
10. sub	\$t1, \$t2, \$t8		\$s0	\$t3	\$t8



			destino	fonte1	fonte2
1. add	\$t0, \$zero,	\$v0	\$t0	\$zero	\$v0
2. add	\$t1, \$t0, \$t2		\$t1	\$t0	\$t2
3. sub	\$s0, \$t3, \$t1		\$s0	\$t3	\$t1
4. lw	\$t4, 4(\$s0)		\$t4	\$s0	
5. beq	\$s0, \$t4, 9		\$s0	\$t4	
9. sw	\$t8, 0(\$s8)		\$t8	\$s8	
10. sub	\$t1, \$t2, \$t8		\$s0	\$t3	\$t8

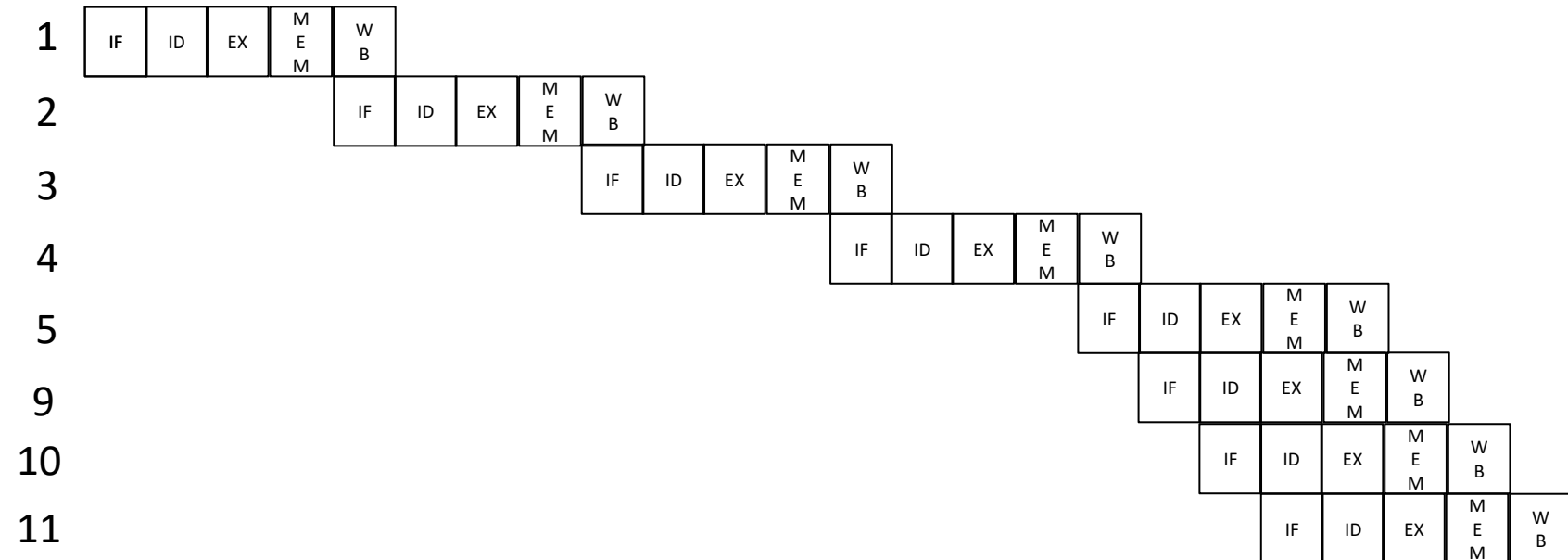


			destino	fonte1	fonte2
1. add	\$t0, \$zero,	\$v0	\$t0	\$zero	\$v0
2. add	\$t1, \$t0, \$t2		\$t1	\$t0	\$t2
3. sub	\$s0, \$t3, \$t1		\$s0	\$t3	\$t1
4. lw	\$t4, 4(\$s0)		\$t4	\$s0	
5. beq	\$s0, \$t4, 9		\$s0	\$t4	
9. sw	\$t8, 0(\$s8)		\$t8	\$s8	
10. sub	\$t1, \$t2, \$t8		\$s0	\$t3	\$t8

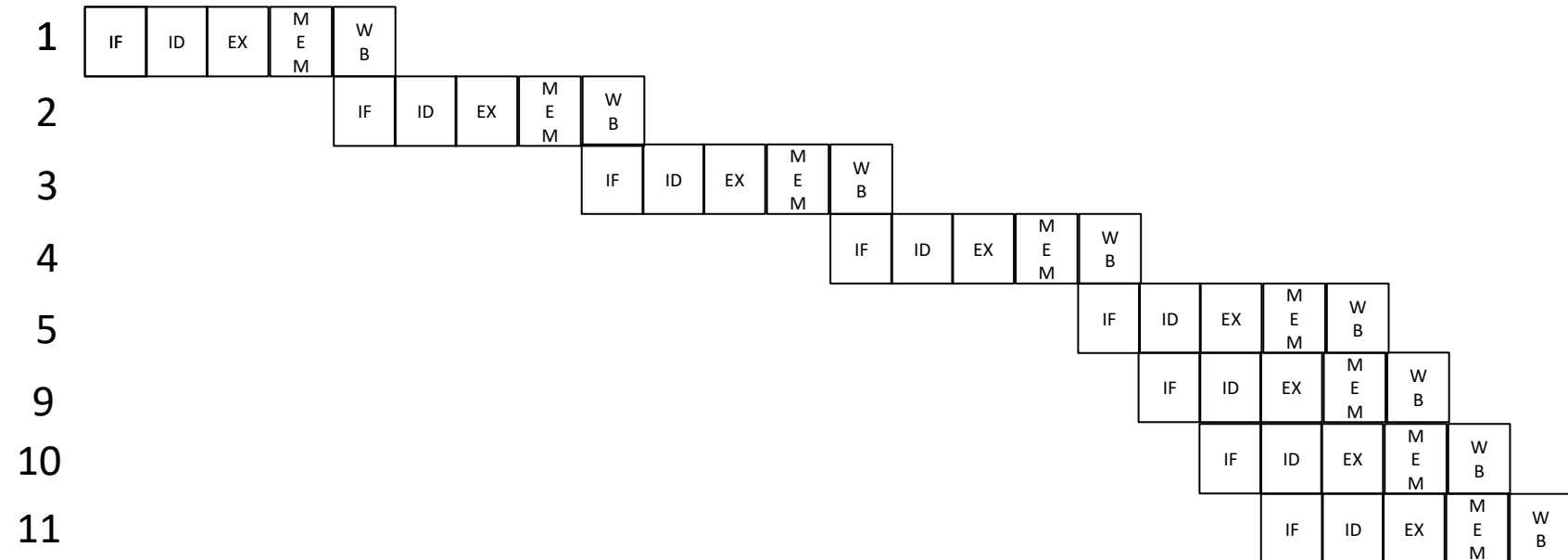


NÃO existe dependência aqui: \$t8 será LIDO na instrução 9 e também na instrução 10

			destino	fonte1	fonte2
1. add	\$t0, \$zero,	\$v0	\$t0	\$zero	\$v0
2. add	\$t1, \$t0, \$t2		\$t1	\$t0	\$t2
3. sub	\$s0, \$t3, \$t1		\$s0	\$t3	\$t1
4. lw	\$t4, 4(\$s0)		\$t4	\$s0	
5. beq	\$s0, \$t4, 9		\$s0	\$t4	
9. sw	\$t8, 0(\$s8)		\$t8	\$s8	
10. sub	\$t1, \$t2, \$t8		\$s0	\$t3	\$t8
11. lw	\$t0, 8(\$s1)		\$t0	\$s1	



			destino	fonte1	fonte2
1. add	\$t0, \$zero,	\$v0	\$t0	\$zero	\$v0
2. add	\$t1, \$t0, \$t2		\$t1	\$t0	\$t2
3. sub	\$s0, \$t3, \$t1		\$s0	\$t3	\$t1
4. lw	\$t4, 4(\$s0)		\$t4	\$s0	
5. beq	\$s0, \$t4, 9		\$s0	\$t4	
9. sw	\$t8, 0(\$s8)		\$t8	\$s8	
10. sub	\$t1, \$t2, \$t8		\$s0	\$t3	\$t8
11. lw	\$t0, 8(\$s1)		\$t0	\$s1	



TOTAL: 24 ciclos