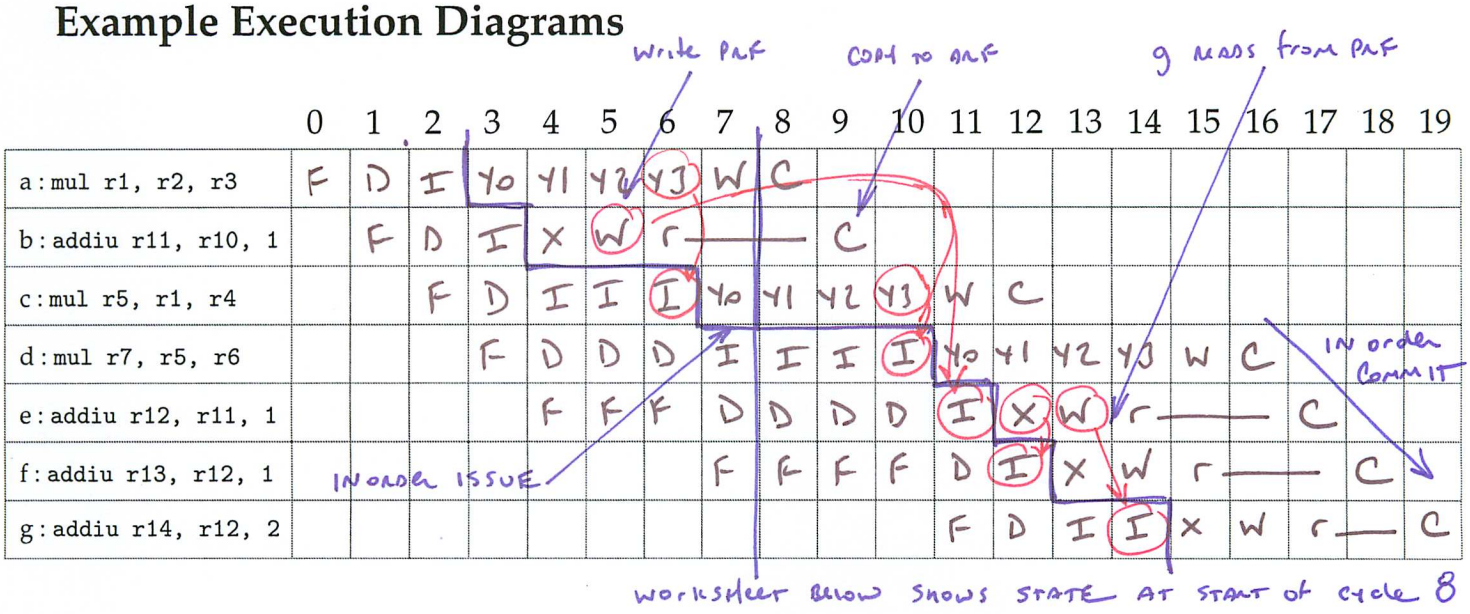
Example Execution Diagrams



	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
a: mul r1, r2, r3	F	D	I	Y0	Y1	Y2	Y3	W	C											
b: addiu r11, r10, 1		F	D	I	X	W	r	—	—	C										
c: mul r5, r1, r4			F	D	I	I	I	Y0	Y1	Y2	Y3	W	C							
d: mul r7, r5, r6				F	D	D	D	I	I	I	I	Y0	Y1	Y2	Y3	W	C			
e: addiu r12, r11, 1					F	F	F	D	D	D	D	I	X	W	r	—	—	C		
f: addiu r13, r12, 1								F	F	F	F	D	I	X	W	r	—	—	C	
g: addiu r14, r12, 2												F	D	I	I	X	W	r	—	C

Physical Register File

r1	2
r2	1
r3	2
r4	3
r5	
r6	4
r7	
r8	
r9	
r10	21
r11	22
r12	
r13	
r14	
...	...
r31	

During cycle 8 COPY r1 from PRF to ARF

Architectural Register File

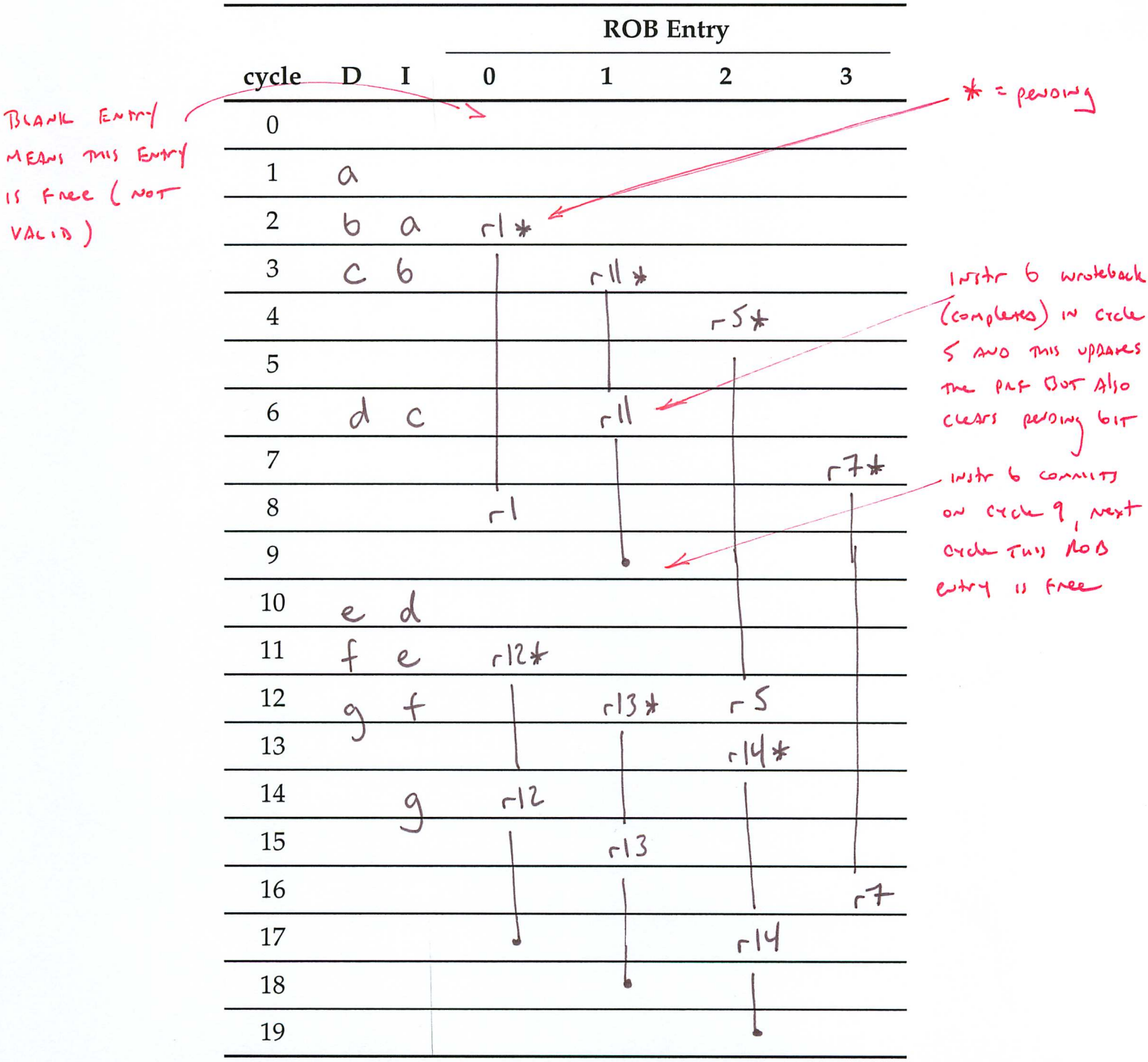
r1	
r2	1
r3	2
r4	3
r5	
r6	4
r7	
r8	
r9	
r10	21
r11	
r12	
r13	
r14	
...	...
r31	

Reorder Buffer

	p	v	rdest
p0	0	1	r1
p1	0	1	r11
p2	1	1	r5
p3	1	1	r7
p4			
p5			
p6			

ENTRY AT HEAD OF ROB IS NOW NOT PENDING. COMMIT STAGE will COPY r1 from PRF to ARF AND POP THIS entry off of the ROB

We can use a table to compactly illustrate how the ROB works.



			ROB Entry			
cycle	D	I	0	1	2	3
0						
1	a					
2	b	a	r1 *			
3	c	b		r11 *		
4					r5 *	
5						
6	d	c		r11		
7						r7 *
8			r1			
9						
10	e	d				
11	f	e	r12 *			
12	g	f		r13 *	r5	
13					r14 *	
14		g	r12			
15				r13		
16						r7
17					r14	
18						
19						