

Λύση 2ης άσκησης

Αλγόριθμος Tomasulo με ROB

Instruction		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1					
SUB.D	F0	F0	F2						
DIV.D	F2	F2	F0						
L.D	F0	8	R1						
DIV.D	F4	F0	F6						
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							
L.D	F0	0	R1						
SUB.D	F0	F0	F2						
DIV.D	F2	F2	F0						
L.D	F0	8	R1						
DIV.D	F4	F0	F6						
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							

	Busy	Address	Dest
Load1			
Load2			
Load3			
Load4			
Load5			

	Busy	Address	Qi	Dest
Store1				
Store2				
Store3				
Store4				
Store5				

		Res. Stations							
Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
1		Add1							
		Add2							
		Add3							
		Add4							
		Mul1							
		Mul2							
		Mul3							
		Mul4							
		Int1							
		Int2							
		Int3							
		Int4							
		Int5							

	Dest	Value	Inst	Ready
ROB1				
ROB2				
ROB3				
ROB4				
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11				
ROB12				

Reg. res.status	F0	F2	F4	F6	R1
Qi					

Instruction

		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2				
SUB.D	F0	F0	F2	2					
DIV.D	F2	F2	F0						
L.D	F0	8	R1						
DIV.D	F4	F0	F6						
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							
L.D	F0	0	R1						
SUB.D	F0	F0	F2						
DIV.D	F2	F2	F0						
L.D	F0	8	R1						
DIV.D	F4	F0	F6						
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							

	Busy	Address	Dest
Load1			
Load2			
Load3			
Load4			
Load5			

	Busy	Address	Qi	Dest
Store1				
Store2				
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1				
ROB2				
ROB3				
ROB4				
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11				
ROB12				

Res. Stations

Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
2	Add1							
	Add2							
	Add3							
	Add4							
2	Mul1							
	Mul2							
	Mul3							
	Mul4							
2	Int1							
	Int2							
	Int3							
	Int4							
	Int5							

Reg. res.status

	F0	F2	F4	F6	R1
Qi					

Instruction

		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3			
SUB.D	F0	F0	F2	2	3				
DIV.D	F2	F2	F0	3					
L.D	F0	8	R1						
DIV.D	F4	F0	F6						
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							
L.D	F0	0	R1						
SUB.D	F0	F0	F2						
DIV.D	F2	F2	F0						
L.D	F0	8	R1						
DIV.D	F4	F0	F6						
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							

	Busy	Address	Dest
Load1	Yes	M[0+R1]	#1
Load2			
Load3			
Load4			
Load5			

	Busy	Address	Qi	Dest
Store1				
Store2				
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1	F0		L.D F0,0(R1)	No
ROB2				
ROB3				
ROB4				
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11				
ROB12				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
3		Add1							
		Add2							
		Add3							
		Add4							
		Mul1							
		Mul2							
		Mul3							
		Mul4							
		Int1							
		Int2							
		Int3							
		Int4							
		Int5							

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#1				

Instruction

		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3	4		
SUB.D	F0	F0	F2	2	3	4			
DIV.D	F2	F2	F0	3	4				
L.D	F0	8	R1	4					
DIV.D	F4	F0	F6						
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							
L.D	F0	0	R1						
SUB.D	F0	F0	F2						
DIV.D	F2	F2	F0						
L.D	F0	8	R1						
DIV.D	F4	F0	F6						
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							

	Busy	Address	Dest
Load1	Yes	M[0+R1]	#1
Load2			
Load3			
Load4			
Load5			

	Busy	Address	Qi	Dest
Store1				
Store2				
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1	F0		L.D F0,0(R1)	No
ROB2	F0		SUB.D F0,F0,F2	No
ROB3				
ROB4				
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11				
ROB12				

Res. Stations

Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
4	Add1	Yes	sub.d		R[F2]	#1		#2
	Add2							
	Add3							
	Add4							
	Mul1							
	Mul2							
	Mul3							
	Mul4							
	Int1							
	Int2							
	Int3							
	Int4							
	Int5							

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#2				

Instruction

		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3	4 - 4	5	
SUB.D	F0	F0	F2	2	3	4			
DIV.D	F2	F2	F0	3	4	5			
L.D	F0	8	R1	4	5				
DIV.D	F4	F0	F6	5					
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							
L.D	F0	0	R1						
SUB.D	F0	F0	F2						
DIV.D	F2	F2	F0						
L.D	F0	8	R1						
DIV.D	F4	F0	F6						
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							

	Busy	Address	Dest
Load1	No		
Load2			
Load3			
Load4			
Load5			

	Busy	Address	Qi	Dest
Store1				
Store2				
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1	F0	M[0+R1]	L.D F0,0(R1)	Yes
ROB2	F0		SUB.D F0,F0,F2	No
ROB3	F2		DIV.D F2,F2,F0	No
ROB4				
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11				
ROB12				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
5	5	Add1	Yes	sub.d	M[0+R1]	R[F2]			#2
		Add2							
		Add3							
		Add4							
		Mul1	Yes	div.d	R[F2]		#2		#3
		Mul2							
		Mul3							
		Mul4							
		Int1							
		Int2							
		Int3							
		Int4							
		Int5							

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#2	#3			

Instruction

		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3	4 - 4	5	6
SUB.D	F0	F0	F2	2	3	4	6		
DIV.D	F2	F2	F0	3	4	5			
L.D	F0	8	R1	4	5	6			
DIV.D	F4	F0	F6	5	6				
S.D	F4	16	R1	6					
DADDI	R1	R1	#-24						
BNEZ	R1	foo							
L.D	F0	0	R1						
SUB.D	F0	F0	F2						
DIV.D	F2	F2	F0						
L.D	F0	8	R1						
DIV.D	F4	F0	F6						
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							

	Busy	Address	Dest
Load1	No		
Load2	Yes	M[8+R1]	#4
Load3			
Load4			
Load5			

	Busy	Address	Qi	Dest
Store1				
Store2				
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1				
ROB2	F0		SUB.D F0,F0,F2	No
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0		L.D F0,8(R1)	No
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11				
ROB12				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
6	4	Add1	Yes	sub.d	M[0+R1]	R[F2]			#2
		Add2							
		Add3							
		Add4							
		Mul1	Yes	div.d	R[F2]		#2		#3
		Mul2							
		Mul3							
		Mul4							
		Int1							
		Int2							
		Int3							
		Int4							
		Int5							

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#4	#3			

Instruction

		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3	4-4	5	6
SUB.D	F0	F0	F2	2	3	4	6		
DIV.D	F2	F2	F0	3	4	5			
L.D	F0	8	R1	4	5	6	7		
DIV.D	F4	F0	F6	5	6	7			
S.D	F4	16	R1	6	7				
DADDI	R1	R1	#-24	7					
BNEZ	R1	foo							
L.D	F0	0	R1						
SUB.D	F0	F0	F2						
DIV.D	F2	F2	F0						
L.D	F0	8	R1						
DIV.D	F4	F0	F6						
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							

	Busy	Address	Dest
Load1	No		
Load2	Yes	M[8+R1]	#4
Load3			
Load4			
Load5			

	Busy	Address	Qi	Dest
Store1				
Store2				
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1				
ROB2	F0		SUB.D F0,F0,F2	No
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0		L.D F0,8(R1)	No
ROB5	F4		DIV.D F4,F0,F6	No
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11				
ROB12				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
7	3	Add1	Yes	sub.d	M[0+R1]	R[F2]			#2
		Add2							
		Add3							
		Add4							
		Mul1	Yes	div.d	R[F2]		#2		#3
		Mul2	Yes	div.d		R[F6]	#4		#5
		Mul3							
		Mul4							
		Int1							
		Int2							
		Int3							
		Int4							
		Int5							

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#4	#3	#5		

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4-4	5	6
SUB.D	F0	F0	F2	2	3	4	6		
DIV.D	F2	F2	F0	3	4	5			
L.D	F0	8	R1	4	5	6	7-7	8	
DIV.D	F4	F0	F6	5	6	7			
S.D	F4	16	R1	6	7	8			
DADDI	R1	R1	#-24	7	8				
BNEZ	R1	foo		8					
L.D	F0	0	R1						
SUB.D	F0	F0	F2						
DIV.D	F2	F2	F0						
L.D	F0	8	R1						
DIV.D	F4	F0	F6						
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3			
Load4			
Load5			

	Busy	Address	Qi	Dest
Store1	Yes	M[16+R1]	#5	#6
Store2				
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1				
ROB2	F0		SUB.D F0,F0,F2	No
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4		DIV.D F4,F0,F6	No
ROB6			S.D F4,16(R1)	No
ROB7				
ROB8				
ROB9				
ROB10				
ROB11				
ROB12				

Res. Stations		Busy	Op	Vj	Vk	Qj	Qk	Dest
Clock	Time							
	8	2	Add1	Yes	sub.d	M[0+R1]	R[F2]	#2
			Add2					
			Add3					
			Add4					
			Mul1	Yes	div.d	R[F2]		#3
	15		Mul2	Yes	div.d	M[8+R1]	R[F6]	#5
			Mul3					
			Mul4					
			Int1					
			Int2					
			Int3					
			Int4					
			Int5					

Reg. res.status	F0	F2	F4	F6	R1
Qi	#4	#3	#5		

Instruction		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3	4-4	5	6
SUB.D	F0	F0	F2	2	3	4	6		
DIV.D	F2	F2	F0	3	4	5			
L.D	F0	8	R1	4	5	6	7-7	8	
DIV.D	F4	F0	F6	5	6	7	9		
S.D	F4	16	R1	6	7	8			
DADDI	R1	R1	#-24	7	8	9			
BNEZ	R1	foo		8	9				
L.D	F0	0	R1	9					
SUB.D	F0	F0	F2						
DIV.D	F2	F2	F0						
L.D	F0	8	R1						
DIV.D	F4	F0	F6						
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3			
Load4			
Load5			

	Busy	Address	Qi	Dest
Store1	Yes	M[16+R1]	#5	#6
Store2				
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1				
ROB2	F0		SUB.D F0,F0,F2	No
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4		DIV.D F4,F0,F6	No
ROB6			S.D F4,16(R1)	No
ROB7	R1		DADDI R1,#-24	No
ROB8				
ROB9				
ROB10				
ROB11				
ROB12				

		Res. Stations							
Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
9	1	Add1	Yes	sub.d	M[0+R1]	R[F2]			#2
		Add2							
		Add3							
		Add4							
		Mul1	Yes	div.d	R[F2]		#2		#3
	14	Mul2	Yes	div.d	M[8+R1]	R[F6]			#5
		Mul3							
		Mul4							
		Int1	Yes	daddi	R[R1]	#-24			#7
		Int2							
		Int3							
		Int4							
		Int5							

Reg. res.status		F0	F2	F4	F6	R1
Qi		#4	#3	#5		#7

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4-4	5	6
SUB.D	F0	F0	F2	2	3	4	6		
DIV.D	F2	F2	F0	3	4	5			
L.D	F0	8	R1	4	5	6	7-7	8	
DIV.D	F4	F0	F6	5	6	7	9		
S.D	F4	16	R1	6	7	8			
DADDI	R1	R1	#-24	7	8	9	10		
BNEZ	R1	foo		8	9	10			
L.D	F0	0	R1	9	10				
SUB.D	F0	F0	F2	10					
DIV.D	F2	F2	F0						
L.D	F0	8	R1						
DIV.D	F4	F0	F6						
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3			
Load4			
Load5			

	Busy	Address	Qi	Dest
Store1	Yes	M[16+R1]	#5	#6
Store2				
Store3				
Store4				
Store5				

Res. Stations		Busy	Op	Vj	Vk	Qj	Qk	Dest
Clock 10	Time							
	0	Add1	Yes	sub.d	M[0+R1]	R[F2]		#2
		Add2						
		Add3						
		Add4						
	13	Mul1	Yes	div.d	R[F2]		#2	#3
		Mul2	Yes	div.d	M[8+R1]	R[F6]		#5
		Mul3						
		Mul4						
		Int1	Yes	daddi	R[R1]	#-24		#7
	Int2	Yes	bnez			#7		
	Int3							
	Int4							
	Int5							

	Dest	Value	Inst	Ready
ROB1				
ROB2	F0		SUB.D F0,F0,F2	No
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4		DIV.D F4,F0,F6	No
ROB6			S.D F4,16(R1)	No
ROB7	R1		DADDI R1,#-24	No
ROB8			BNEZ R1,foo	No
ROB9				
ROB10				
ROB11				
ROB12				

Reg. res.status	F0	F2	F4	F6	R1
Qi	#4	#3	#5		#7

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 - 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 - 10	11	
DIV.D	F2	F2	F0	3	4	5			
L.D	F0	8	R1	4	5	6	7 - 7	8	
DIV.D	F4	F0	F6	5	6	7	9		
S.D	F4	16	R1	6	7	8			
DADDI	R1	R1	#-24	7	8	9	10 - 10		
BNEZ	R1	foo		8	9	10			
L.D	F0	0	R1	9	10	11			
SUB.D	F0	F0	F2	10	11				
DIV.D	F2	F2	F0	11					
L.D	F0	8	R1						
DIV.D	F4	F0	F6						
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	Yes	M[0+R1]	#9
Load4			
Load5			

	Busy	Address	Qi	Dest
Store1	Yes	M[16+R1]	#5	#6
Store2				
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1				
ROB2	F0		SUB.D F0,F0,F2	No
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4		DIV.D F4,F0,F6	No
ROB6			S.D F4,16(R1)	No
ROB7	R1		DADDI R1,#-24	No
ROB8			BNEZ R1,foo	No
ROB9	F0		L.D F0,0(R1)	No
ROB10				
ROB11				
ROB12				

Res. Stations		Busy	Op	Vj	Vk	Qj	Qk	Dest
Clock 11	Time							
	Name							
	Add1	No						
	Add2							
	Add3							
	Add4							
	15	Mul1	Yes	div.d	R[F2]	R[F0]		#3
	12	Mul2	Yes	div.d	M[8+R1]	R[F6]		#5
		Mul3						
		Mul4						
		Int1	Yes	daddi	R[R1]	#-24		#7
		Int2	Yes	bnez			#7	
		Int3						
		Int4						
		Int5						

Reg. res.status	F0	F2	F4	F6	R1
Qi	#9	#3	#5		#7

Instruction		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3	4 - 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 - 10	11	12
DIV.D	F2	F2	F0	3	4	5			
L.D	F0	8	R1	4	5	6	7 - 7	8	
DIV.D	F4	F0	F6	5	6	7	9		
S.D	F4	16	R1	6	7	8			
DADDI	R1	R1	#-24	7	8	9	10 - 10	12	
BNEZ	R1	foo		8	9	10			
L.D	F0	0	R1	9	10	11			
SUB.D	F0	F0	F2	10	11	12			
DIV.D	F2	F2	F0	11	12				
L.D	F0	8	R1	12					
DIV.D	F4	F0	F6						
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	Yes	M[0+R1]	#9
Load4			
Load5			

	Busy	Address	Qi	Dest
Store1	Yes	M[16+R1]	#5	#6
Store2				
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1				
ROB2				
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4		DIV.D F4,F0,F6	No
ROB6			S.D F4,16(R1)	No
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	No
ROB9	F0		L.D F0,0(R1)	No
ROB10	F0		SUB.D F0,F0,F2	No
ROB11				
ROB12				

Res. Stations		Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
Clock 12			Add1	No						
			Add2	Yes	sub.d			#9	#3	#10
			Add3							
			Add4							
		15	Mul1	Yes	div.d	R[F2]	R[F0]			#3
		11	Mul2	Yes	div.d	M[8+R1]	R[F6]			#5
			Mul3							
			Mul4							
			Int1	No						
			Int2	Yes	bnez	R[R1]				
			Int3							
			Int4							
			Int5							

Reg. res.status	F0	F2	F4	F6	R1
Qi	#10	#3	#5		#7

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 - 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 - 10	11	12
DIV.D	F2	F2	F0	3	4	5			
L.D	F0	8	R1	4	5	6	7 - 7	8	
DIV.D	F4	F0	F6	5	6	7	9		
S.D	F4	16	R1	6	7	8			
DADDI	R1	R1	#-24	7	8	9	10 - 10	12	
BNEZ	R1	foo		8	9	10	13		
L.D	F0	0	R1	9	10	11			
SUB.D	F0	F0	F2	10	11	12			
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13				
DIV.D	F4	F0	F6	13					
S.D	F4	16	R1						
DADDI	R1	R1	#-24						
BNEZ	R1	foo							

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	Yes	M[0+R1]	#9
Load4			
Load5			

	Busy	Address	Qi	Dest
Store1	Yes	M[16+R1]	#5	#6
Store2				
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1				
ROB2				
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4		DIV.D F4,F0,F6	No
ROB6			S.D F4,16(R1)	No
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	No
ROB9	F0		L.D F0,0(R1)	No
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
13		Add1	No						
		Add2	Yes	sub.d			#9	#3	#10
		Add3							
		Add4							
	15	Mul1	Yes	div.d	R[F2]	R[F0]			#3
	10	Mul2	Yes	div.d	M[8+R1]	R[F6]			#5
		Mul3	Yes	div.d			#3	#10	#11
		Mul4							
		Int1	No						
		Int2	Yes	bnez	R[R1]				
		Int3							
		Int4							
		Int5							

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#10	#11	#5		#7

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4-4	5	6
SUB.D	F0	F0	F2	2	3	4	6-10	11	12
DIV.D	F2	F2	F0	3	4	5			
L.D	F0	8	R1	4	5	6	7-7	8	
DIV.D	F4	F0	F6	5	6	7	9		
S.D	F4	16	R1	6	7	8			
DADDI	R1	R1	#-24	7	8	9	10-10	12	
BNEZ	R1	foo		8	9	10	13-13	14	
L.D	F0	0	R1	9	10	11	14		
SUB.D	F0	F0	F2	10	11	12			
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14			
DIV.D	F4	F0	F6	13	14				
S.D	F4	16	R1	14					
DADDI	R1	R1	#-24						
BNEZ	R1	foo							

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	Yes	M[0+R1]	#9
Load4	Yes	M[8+R1]	#12
Load5			

	Busy	Address	Qi	Dest
Store1	Yes	M[16+R1]	#5	#6
Store2				
Store3				
Store4				
Store5				

Res. Stations		Busy	Op	Vj	Vk	Qj	Qk	Dest	
Clock 14	Time	Name							
		Add1	No						
		Add2	Yes	sub.d			#9	#3	#10
		Add3							
		Add4							
	15	Mul1	Yes	div.d	R[F2]	R[F0]			#3
	9	Mul2	Yes	div.d	M[8+R1]	R[F6]			#5
		Mul3	Yes	div.d			#3	#10	#11
		Mul4							
		Int1	No						
		Int2	No						
		Int3							
		Int4							
		Int5							

	Dest	Value	Inst	Ready
ROB1				
ROB2				
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4		DIV.D F4,F0,F6	No
ROB6			S.D F4,16(R1)	No
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	Yes
ROB9	F0		L.D F0,0(R1)	No
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0		L.D F0,8(R1)	No

Reg. res.status	F0	F2	F4	F6	R1
Qi	#12	#11	#5		#7

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5			
L.D	F0	8	R1	4	5	6	7 – 7	8	
DIV.D	F4	F0	F6	5	6	7	9		
S.D	F4	16	R1	6	7	8			
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	
BNEZ	R1	foo		8	9	10	13 – 13	14	
L.D	F0	0	R1	9	10	11	14 – 14	15	
SUB.D	F0	F0	F2	10	11	12			
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15		
DIV.D	F4	F0	F6	13	14	15			
S.D	F4	16	R1	14	15				
DADDI	R1	R1	#-24	15					
BNEZ	R1	foo							

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	Yes	M[8+R1]	#12
Load5			

	Busy	Address	Qi	Dest
Store1	Yes	M[16+R1]	#5	#6
Store2				
Store3				
Store4				
Store5				

Res. Stations		Busy	Op	Vj	Vk	Qj	Qk	Dest
Clock 15	Time							
	Name							
	Add1	No						
	Add2	Yes	sub.d	R[F0]			#3	#10
	Add3							
	Add4							
	15	Mul1	Yes	div.d	R[F2]	R[F0]		#3
	8	Mul2	Yes	div.d	M[8+R1]	R[F6]		#5
		Mul3	Yes	div.d			#3	#10
		Mul4	Yes	div.d		R[F6]	#12	#1
		Int1	No					
		Int2	No					
		Int3						
		Int4						
		Int5						

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2				
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4		DIV.D F4,F0,F6	No
ROB6			S.D F4,16(R1)	No
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	Yes
ROB9	F0	M[0+R1]	L.D F0,0(R1)	Yes
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0		L.D F0,8(R1)	No

Reg. res.status	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#7

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5			
L.D	F0	8	R1	4	5	6	7 – 7	8	
DIV.D	F4	F0	F6	5	6	7	9		
S.D	F4	16	R1	6	7	8			
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	
BNEZ	R1	foo		8	9	10	13 – 13	14	
L.D	F0	0	R1	9	10	11	14 – 14	15	
SUB.D	F0	F0	F2	10	11	12			
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15			
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16				
BNEZ	R1	foo		16					

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5	No		

	Busy	Address	Qi	Dest
Store1	Yes	M[16+R1]	#5	#6
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4		DIV.D F4,F0,F6	No
ROB6			S.D F4,16(R1)	No
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	Yes
ROB9	F0	M[0+R1]	L.D F0,0(R1)	Yes
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
16		Add1	No						
		Add2	Yes	sub.d	R[F0]			#3	#10
		Add3							
		Add4							
	15	Mul1	Yes	div.d	R[F2]	R[F0]			#3
	7	Mul2	Yes	div.d	M[8+R1]	R[F6]			#5
		Mul3	Yes	div.d			#3	#10	#11
	15	Mul4	Yes	div.d	M[8+R1]	R[F6]			#1
		Int1	No						
		Int2	No						
		Int3							
		Int4							
		Int5							

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#7

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 - 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 - 10	11	12
DIV.D	F2	F2	F0	3	4	5			
L.D	F0	8	R1	4	5	6	7 - 7	8	
DIV.D	F4	F0	F6	5	6	7	9		
S.D	F4	16	R1	6	7	8			
DADDI	R1	R1	#-24	7	8	9	10 - 10	12	
BNEZ	R1	foo		8	9	10	13 - 13	14	
L.D	F0	0	R1	9	10	11	14 - 14	15	
SUB.D	F0	F0	F2	10	11	12			
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 - 15	16	
DIV.D	F4	F0	F6	13	14	15			
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16				
BNEZ	R1	foo		16					

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	Yes	M[16+R1]	#5	#6
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

Res. Stations		Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
Clock 17			Add1	No						
			Add2	Yes	sub.d	R[F0]			#3	#10
			Add3							
			Add4							
	15		Mul1	Yes	div.d	R[F2]	R[F0]			#3
	6		Mul2	Yes	div.d	M[8+R1]	R[F6]			#5
			Mul3	Yes	div.d			#3	#10	#11
	15		Mul4	Yes	div.d	M[8+R1]	R[F6]			#1
			Int1	No						
			Int2	No						
			Int3							
			Int4							
			Int5							

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4		DIV.D F4,F0,F6	No
ROB6			S.D F4,16(R1)	No
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	Yes
ROB9	F0	M[0+R1]	L.D F0,0(R1)	Yes
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

- ROB full: η DADDI δεν μπορεί να γίνει issue

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#7

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Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5			
L.D	F0	8	R1	4	5	6	7 – 7	8	
DIV.D	F4	F0	F6	5	6	7	9		
S.D	F4	16	R1	6	7	8			
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	
BNEZ	R1	foo		8	9	10	13 – 13	14	
L.D	F0	0	R1	9	10	11	14 – 14	15	
SUB.D	F0	F0	F2	10	11	12			
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15			
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16				
BNEZ	R1	foo		16					

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5	No		

	Busy	Address	Qi	Dest
Store1	Yes	$M[16+R1]$	#5	#6
Store2	Yes	$M[16+R1]$	#1	#2
Store3				
Store4				
Store5				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
22		Add1	No						
		Add2	Yes	sub.d	R[F0]			#3	#10
		Add3							
		Add4							
	15	Mul1	Yes	div.d	R[F2]	R[F0]			#3
	1	Mul2	Yes	div.d	$M[8+R1]$	R[F6]			#5
		Mul3	Yes	div.d			#3	#10	#11
	15	Mul4	Yes	div.d	$M[8+R1]$	R[F6]			#1
		Int1	No						
		Int2	No						
		Int3							
		Int4							
		Int5							

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0	$M[8+R1]$	L.D F0,8(R1)	Yes
ROB5	F4		DIV.D F4,F0,F6	No
ROB6			S.D F4,16(R1)	No
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	Yes
ROB9	F0	$M[0+R1]$	L.D F0,0(R1)	Yes
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	$M[8+R1]$	L.D F0,8(R1)	Yes

- ROB full: η DADDI δεν μπορεί να γίνει issue

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#7

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 - 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 - 10	11	12
DIV.D	F2	F2	F0	3	4	5			
L.D	F0	8	R1	4	5	6	7 - 7	8	
DIV.D	F4	F0	F6	5	6	7	9		
S.D	F4	16	R1	6	7	8			
DADDI	R1	R1	#-24	7	8	9	10 - 10	12	
BNEZ	R1	foo		8	9	10	13 - 13	14	
L.D	F0	0	R1	9	10	11	14 - 14	15	
SUB.D	F0	F0	F2	10	11	12			
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 - 15	16	
DIV.D	F4	F0	F6	13	14	15			
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16				
BNEZ	R1	foo		16					

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5	No		

	Busy	Address	Qi	Dest
Store1	Yes	M[16+R1]	#5	#6
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
23		Add1	No						
		Add2	Yes	sub.d	R[F0]			#3	#10
		Add3							
		Add4							
	15	Mul1	Yes	div.d	R[F2]	R[F0]			#3
	0	Mul2	Yes	div.d	M[8+R1]	R[F6]			#5
		Mul3	Yes	div.d			#3	#10	#11
	15	Mul4	Yes	div.d	M[8+R1]	R[F6]			#1
		Int1	No						
		Int2	No						
		Int3							
		Int4							
		Int5							

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4		DIV.D F4,F0,F6	No
ROB6			S.D F4,16(R1)	No
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	Yes
ROB9	F0	M[0+R1]	L.D F0,0(R1)	Yes
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

- ROB full: η DADDI δεν μπορεί να γίνει issue

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#7

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 - 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 - 10	11	12
DIV.D	F2	F2	F0	3	4	5	24		
L.D	F0	8	R1	4	5	6	7 - 7	8	
DIV.D	F4	F0	F6	5	6	7	9 - 23	24	
S.D	F4	16	R1	6	7	8			
DADDI	R1	R1	#-24	7	8	9	10 - 10	12	
BNEZ	R1	foo		8	9	10	13 - 13	14	
L.D	F0	0	R1	9	10	11	14 - 14	15	
SUB.D	F0	F0	F2	10	11	12			
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 - 15	16	
DIV.D	F4	F0	F6	13	14	15			
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16				
BNEZ	R1	foo		16					

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	Yes	M[16+R1]	R[F4]	#6
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4	R[F4]	DIV.D F4,F0,F6	Yes
ROB6			S.D F4,16(R1)	No
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	Yes
ROB9	F0	M[0+R1]	L.D F0,0(R1)	Yes
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
24		Add1	No						
		Add2	Yes	sub.d	R[F0]			#3	#10
		Add3							
		Add4							
	14	Mul1	Yes	div.d	R[F2]	R[F0]			#3
		Mul2	No						
		Mul3	Yes	div.d			#3	#10	#11
	15	Mul4	Yes	div.d	M[8+R1]	R[F6]			#1
		Int1	No						
		Int2	No						
		Int3							
		Int4							
		Int5							

- ROB full: η DADDI δεν μπορεί να γίνει issue

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#7

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24		
L.D	F0	8	R1	4	5	6	7 – 7	8	
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	
S.D	F4	16	R1	6	7	8	25		
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	
BNEZ	R1	foo		8	9	10	13 – 13	14	
L.D	F0	0	R1	9	10	11	14 – 14	15	
SUB.D	F0	F0	F2	10	11	12			
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15			
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16				
BNEZ	R1	foo		16					

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	Yes	M[16+R1]	R[F4]	#6
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

Res. Stations		Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest	
Clock 25			Add1	No							
			Add2	Yes	sub.d	R[F0]			#3	#10	
			Add3								
			Add4								
		13		Mul1	Yes	div.d	R[F2]	R[F0]			#3
				Mul2	No						
				Mul3	Yes	div.d			#3	#10	#11
		15		Mul4	Yes	div.d	M[8+R1]	R[F6]			#1
				Int1	No						
				Int2	No						
				Int3							
				Int4							
				Int5							

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4	R[F4]	DIV.D F4,F0,F6	Yes
ROB6			S.D F4,16(R1)	No
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	Yes
ROB9	F0	M[0+R1]	L.D F0,0(R1)	Yes
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

- ROB full: η DADDI δεν μπορεί να γίνει issue

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#7

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 - 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 - 10	11	12
DIV.D	F2	F2	F0	3	4	5	24		
L.D	F0	8	R1	4	5	6	7 - 7	8	
DIV.D	F4	F0	F6	5	6	7	9 - 23	24	
S.D	F4	16	R1	6	7	8	25 - 25	26	
DADDI	R1	R1	#-24	7	8	9	10 - 10	12	
BNEZ	R1	foo		8	9	10	13 - 13	14	
L.D	F0	0	R1	9	10	11	14 - 14	15	
SUB.D	F0	F0	F2	10	11	12			
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 - 15	16	
DIV.D	F4	F0	F6	13	14	15			
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16				
BNEZ	R1	foo		16					

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

Res. Stations		Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
Clock 26			Add1	No						
			Add2	Yes	sub.d	R[F0]			#3	#10
			Add3							
			Add4							
		12	Mul1	Yes	div.d	R[F2]	R[F0]			#3
			Mul2	No						
			Mul3	Yes	div.d			#3	#10	#11
		15	Mul4	Yes	div.d	M[8+R1]	R[F6]			#1
			Int1	No						
			Int2	No						
			Int3							
			Int4							
			Int5							

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4	R[F4]	DIV.D F4,F0,F6	Yes
ROB6			S.D F4,16(R1)	Yes
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	Yes
ROB9	F0	M[0+R1]	L.D F0,0(R1)	Yes
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

- ROB full: η DADDI δεν μπορεί να γίνει issue

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#7

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Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24		
L.D	F0	8	R1	4	5	6	7 – 7	8	
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	
S.D	F4	16	R1	6	7	8	25 – 25	26	
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	
BNEZ	R1	foo		8	9	10	13 – 13	14	
L.D	F0	0	R1	9	10	11	14 – 14	15	
SUB.D	F0	F0	F2	10	11	12			
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15			
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16				
BNEZ	R1	foo		16					

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	F2		DIV.D F2,F2,F0	No
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4	R[F4]	DIV.D F4,F0,F6	Yes
ROB6			S.D F4,16(R1)	Yes
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	Yes
ROB9	F0	M[0+R1]	L.D F0,0(R1)	Yes
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

- ROB full: η DADDI δεν μπορεί να γίνει issue

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
38		Add1	No						
		Add2	Yes	sub.d	R[F0]			#3	#10
		Add3							
		Add4							
	0	Mul1	Yes	div.d	R[F2]	R[F0]			#3
		Mul2	No						
		Mul3	Yes	div.d			#3	#10	#11
	15	Mul4	Yes	div.d	M[8+R1]	R[F6]			#1
		Int1	No						
		Int2	No						
		Int3							
		Int4							
		Int5							

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#7

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	
L.D	F0	8	R1	4	5	6	7 – 7	8	
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	
S.D	F4	16	R1	6	7	8	25 – 25	26	
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	
BNEZ	R1	foo		8	9	10	13 – 13	14	
L.D	F0	0	R1	9	10	11	14 – 14	15	
SUB.D	F0	F0	F2	10	11	12			
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15	39		
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16				
BNEZ	R1	foo		16					

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
39									
	5	Add1	No						
		Add2	Yes	sub.d	R[F0]	R[F2]			#10
		Add3							
		Add4							
		Mul1	No						
		Mul2	No						
		Mul3	Yes	div.d	R[F2]			#10	#11
	14	Mul4	Yes	div.d	M[8+R1]	R[F6]			#1
		Int1	No						
		Int2	No						
		Int3							
		Int4							
		Int5							

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	F2	R[F2]	DIV.D F2,F2,F0	Yes
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4	R[F4]	DIV.D F4,F0,F6	Yes
ROB6			S.D F4,16(R1)	Yes
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	Yes
ROB9	F0	M[0+R1]	L.D F0,0(R1)	Yes
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

- ROB full: η DADDI δεν μπορεί να γίνει issue

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#7

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	
S.D	F4	16	R1	6	7	8	25 – 25	26	
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	
BNEZ	R1	foo		8	9	10	13 – 13	14	
L.D	F0	0	R1	9	10	11	14 – 14	15	
SUB.D	F0	F0	F2	10	11	12	40		
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15	39		
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16				
BNEZ	R1	foo		16					

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3				
ROB4	F0	M[8+R1]	L.D F0,8(R1)	Yes
ROB5	F4	R[F4]	DIV.D F4,F0,F6	Yes
ROB6			S.D F4,16(R1)	Yes
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	Yes
ROB9	F0	M[0+R1]	L.D F0,0(R1)	Yes
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
40		Add1	No						
	4	Add2	Yes	sub.d	R[F0]	R[F2]			#10
		Add3							
		Add4							
		Mul1	No						
		Mul2	No						
		Mul3	Yes	div.d	R[F2]			#10	#11
	13	Mul4	Yes	div.d	M[8+R1]	R[F6]			#1
		Int1	No						
		Int2	No						
		Int3							
		Int4							
		Int5							

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#7

Instruction		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	
S.D	F4	16	R1	6	7	8	25 – 25	26	
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	
BNEZ	R1	foo		8	9	10	13 – 13	14	
L.D	F0	0	R1	9	10	11	14 – 14	15	
SUB.D	F0	F0	F2	10	11	12	40		
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15	39		
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16	41			
BNEZ	R1	foo		16	41				

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

		Res. Stations							
Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
41	3	Add1	No						
		Add2	Yes	sub.d	R[F0]	R[F2]			#10
		Add3							
		Add4							
		Mul1	No						
	12	Mul2	No						
		Mul3	Yes	div.d	R[F2]			#10	#11
		Mul4	Yes	div.d	M[8+R1]	R[F6]			#1
		Int1	No						
		Int2	No						
		Int3	Yes	daddi	R[R1]	#-24			#3
		Int4							
		Int5							

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	R1		DADDI R1,#-24	No
ROB4				
ROB5	F4	R[F4]	DIV.D F4,F0,F6	Yes
ROB6			S.D F4,16(R1)	Yes
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	Yes
ROB9	F0	M[0+R1]	L.D F0,0(R1)	Yes
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Reg. res.status		F0	F2	F4	F6	R1
Qi		#12	#11	#1		#3

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	
BNEZ	R1	foo		8	9	10	13 – 13	14	
L.D	F0	0	R1	9	10	11	14 – 14	15	
SUB.D	F0	F0	F2	10	11	12	40		
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15	39		
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16	41	42		
BNEZ	R1	foo		16	41	42			

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

Res. Stations		Busy	Op	Vj	Vk	Qj	Qk	Dest
Clock 42	Time							
	Name	Add1	No					
		Add2	Yes	sub.d	R[F0]	R[F2]		#10
		Add3						
		Add4						
		Mul1	No					
		Mul2	No					
		Mul3	Yes	div.d	R[F2]		#10	#11
		Mul4	Yes	div.d	M[8+R1]	R[F6]		#1
	11	Int1	No					
	Int2	No						
	Int3	Yes	daddi	R[R1]	#-24		#3	
	Int4	Yes	bnez			#3		
	Int5							

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	R1		DADDI R1,#-24	No
ROB4			BNEZ R1,foo	No
ROB5				
ROB6			S.D F4,16(R1)	Yes
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	Yes
ROB9	F0	M[0+R1]	L.D F0,0(R1)	Yes
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Reg. res.status	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#3

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	
BNEZ	R1	foo		8	9	10	13 – 13	14	
L.D	F0	0	R1	9	10	11	14 – 14	15	
SUB.D	F0	F0	F2	10	11	12	40		
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15	39		
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16	41	42 – 42	43	
BNEZ	R1	foo		16	41	42			

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

Res. Stations		Busy	Op	Vj	Vk	Qj	Qk	Dest
Clock 43	Time	Name						
	1	Add1	No					
		Add2	Yes	sub.d	R[F0]	R[F2]		#10
		Add3						
		Add4						
		Mul1	No					
		Mul2	No					
		Mul3	Yes	div.d	R[F2]		#10	#11
	10	Mul4	Yes	div.d	M[8+R1]	R[F6]		#1
		Int1	No					
		Int2	No					
		Int3	No					
		Int4	Yes	bnez	R[R1]			
		Int5						

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	R1	R[R1]	DADDI R1,#-24	Yes
ROB4			BNEZ R1,foo	No
ROB5				
ROB6				
ROB7	R1	R[R1]	DADDI R1,#-24	Yes
ROB8			BNEZ R1,foo	Yes
ROB9	F0	M[0+R1]	L.D F0,0(R1)	Yes
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Reg. res.status	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#3

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	44
BNEZ	R1	foo		8	9	10	13 – 13	14	
L.D	F0	0	R1	9	10	11	14 – 14	15	
SUB.D	F0	F0	F2	10	11	12	40		
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15	39		
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16	41	42 – 42	43	
BNEZ	R1	foo		16	41	42	44		

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
44	0	Add1	No						
		Add2	Yes	sub.d	R[F0]	R[F2]			#10
		Add3							
		Add4							
		Mul1	No						
		Mul2	No						
		Mul3	Yes	div.d	R[F2]			#10	#11
	9	Mul4	Yes	div.d	M[8+R1]	R[F6]			#1
		Int1	No						
		Int2	No						
		Int3	No						
		Int4	Yes	bnez	R[R1]				
		Int5							

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	R1	R[R1]	DADDI R1,#-24	Yes
ROB4			BNEZ R1,foo	No
ROB5				
ROB6				
ROB7				
ROB8			BNEZ R1,foo	Yes
ROB9	F0	M[0+R1]	L.D F0,0(R1)	Yes
ROB10	F0		SUB.D F0,F0,F2	No
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#3

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	44
BNEZ	R1	foo		8	9	10	13 – 13	14	45
L.D	F0	0	R1	9	10	11	14 – 14	15	
SUB.D	F0	F0	F2	10	11	12	40 – 44	45	
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15	39		
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16	41	42 – 42	43	
BNEZ	R1	foo		16	41	42	44 – 44	45	

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	R1	R[R1]	DADDI R1,#-24	Yes
ROB4			BNEZ R1,foo	Yes
ROB5				
ROB6				
ROB7				
ROB8				
ROB9	F0	M[0+R1]	L.D F0,0(R1)	Yes
ROB10	F0	R[F0]	SUB.D F0,F0,F2	Yes
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
45		Add1	No						
		Add2	No						
		Add3							
		Add4							
		Mul1	No						
		Mul2	No						
	15	Mul3	Yes	div.d	R[F2]	R[F0]			#11
	8	Mul4	Yes	div.d	M[8+R1]	R[F6]			#1
		Int1	No						
		Int2	No						
		Int3	No						
		Int4	No						
		Int5							

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#3

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	44
BNEZ	R1	foo		8	9	10	13 – 13	14	45
L.D	F0	0	R1	9	10	11	14 – 14	15	46
SUB.D	F0	F0	F2	10	11	12	40 – 44	45	
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15	39		
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16	41	42 – 42	43	
BNEZ	R1	foo		16	41	42	44 – 44	45	

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	R1	R[R1]	DADDI R1,#-24	Yes
ROB4			BNEZ R1,foo	Yes
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10	F0	R[F0]	SUB.D F0,F0,F2	Yes
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
46		Add1	No						
		Add2	No						
		Add3							
		Add4							
		Mul1	No						
		Mul2	No						
	15	Mul3	Yes	div.d	R[F2]	R[F0]			#11
	7	Mul4	Yes	div.d	M[8+R1]	R[F6]			#1
		Int1	No						
		Int2	No						
		Int3	No						
		Int4	No						
		Int5							

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#3

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	44
BNEZ	R1	foo		8	9	10	13 – 13	14	45
L.D	F0	0	R1	9	10	11	14 – 14	15	46
SUB.D	F0	F0	F2	10	11	12	40 – 44	45	47
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15	39		
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16	41	42 – 42	43	
BNEZ	R1	foo		16	41	42	44 – 44	45	

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	R1	R[R1]	DADDI R1,#-24	Yes
ROB4			BNEZ R1,foo	Yes
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
47		Add1	No						
		Add2	No						
		Add3							
		Add4							
		Mul1	No						
		Mul2	No						
	15	Mul3	Yes	div.d	R[F2]	R[F0]			#11
	6	Mul4	Yes	div.d	M[8+R1]	R[F6]			#1
		Int1	No						
		Int2	No						
		Int3	No						
		Int4	No						
		Int5							

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#3

...

Instruction	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	44
BNEZ	R1	foo		8	9	10	13 – 13	14	45
L.D	F0	0	R1	9	10	11	14 – 14	15	46
SUB.D	F0	F0	F2	10	11	12	40 – 44	45	47
DIV.D	F2	F2	F0	11	12	13			
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15	39		
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16	41	42 – 42	43	
BNEZ	R1	foo		16	41	42	44 – 44	45	

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	Yes	M[16+R1]	#1	#2
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1	F4		DIV.D F4,F0,F6	No
ROB2			S.D F4,16(R1)	No
ROB3	R1	R[R1]	DADDI R1,#-24	Yes
ROB4			BNEZ R1,foo	Yes
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Res. Stations

Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
	Add1	No						
	Add2	No						
	Add3							
	Add4							
	Mul1	No						
	Mul2	No						
15	Mul3	Yes	div.d	R[F2]	R[F0]			#11
0	Mul4	Yes	div.d	M[8+R1]	R[F6]			#1
	Int1	No						
	Int2	No						
	Int3	No						
	Int4	No						
	Int5							

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#3

Instruction		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	44
BNEZ	R1	foo		8	9	10	13 – 13	14	45
L.D	F0	0	R1	9	10	11	14 – 14	15	46
SUB.D	F0	F0	F2	10	11	12	40 – 44	45	47
DIV.D	F2	F2	F0	11	12	13	54		
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15	39 – 53	54	
S.D	F4	16	R1	14	15	16			
DADDI	R1	R1	#-24	15	16	41	42 – 42	43	
BNEZ	R1	foo		16	41	42	44 – 44	45	

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	Yes	M[16+R1]	R[F4]	#2
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1	F4	R[F4]	DIV.D F4,F0,F6	Yes
ROB2			S.D F4,16(R1)	No
ROB3	R1	R[R1]	DADDI R1,#-24	Yes
ROB4			BNEZ R1,foo	Yes
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
54		Add1	No						
		Add2	No						
		Add3							
		Add4							
		Mul1	No						
		Mul2	No						
	14	Mul3	Yes	div.d	R[F2]	R[F0]			#11
		Mul4	No						
		Int1	No						
		Int2	No						
		Int3	No						
		Int4	No						
		Int5	No						

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#3

Instruction		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	44
BNEZ	R1	foo		8	9	10	13 – 13	14	45
L.D	F0	0	R1	9	10	11	14 – 14	15	46
SUB.D	F0	F0	F2	10	11	12	40 – 44	45	47
DIV.D	F2	F2	F0	11	12	13	54		
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15	39 – 53	54	
S.D	F4	16	R1	14	15	16	55		
DADDI	R1	R1	#-24	15	16	41	42 – 42	43	
BNEZ	R1	foo		16	41	42	44 – 44	45	

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	Yes	M[16+R1]	R[F4]	#2
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1	F4	R[F4]	DIV.D F4,F0,F6	Yes
ROB2			S.D F4,16(R1)	No
ROB3	R1	R[R1]	DADDI R1,#-24	Yes
ROB4			BNEZ R1,foo	Yes
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
55		Add1	No						
		Add2	No						
		Add3							
		Add4							
		Mul1	No						
		Mul2	No						
	13	Mul3	Yes	div.d	R[F2]	R[F0]			#11
		Mul4	No						
		Int1	No						
		Int2	No						
		Int3	No						
		Int4	No						
		Int5	No						

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#3

Instruction

		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	44
BNEZ	R1	foo		8	9	10	13 – 13	14	45
L.D	F0	0	R1	9	10	11	14 – 14	15	46
SUB.D	F0	F0	F2	10	11	12	40 – 44	45	47
DIV.D	F2	F2	F0	11	12	13	54		
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15	39 – 53	54	
S.D	F4	16	R1	14	15	16	55 – 55	56	
DADDI	R1	R1	#-24	15	16	41	42 – 42	43	
BNEZ	R1	foo		16	41	42	44 – 44	45	

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	No			
Store3				
Store4				
Store5				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
56		Add1	No						
		Add2	No						
		Add3							
		Add4							
		Mul1	No						
		Mul2	No						
	12	Mul3	Yes	div.d	R[F2]	R[F0]			#11
		Mul4	No						
		Int1	No						
		Int2	No						
		Int3	No						
		Int4	No						
		Int5	No						

	Dest	Value	Inst	Ready
ROB1	F4	R[F4]	DIV.D F4,F0,F6	Yes
ROB2			S.D F4,16(R1)	Yes
ROB3	R1	R[R1]	DADDI R1,#-24	Yes
ROB4			BNEZ R1,foo	Yes
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#3

...

Instruction

		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	44
BNEZ	R1	foo		8	9	10	13 – 13	14	45
L.D	F0	0	R1	9	10	11	14 – 14	15	46
SUB.D	F0	F0	F2	10	11	12	40 – 44	45	47
DIV.D	F2	F2	F0	11	12	13	54		
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15	39 – 53	54	
S.D	F4	16	R1	14	15	16	55 – 55	56	
DADDI	R1	R1	#-24	15	16	41	42 – 42	43	
BNEZ	R1	foo		16	41	42	44 – 44	45	

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	No			
Store3				
Store4				
Store5				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
68		Add1	No						
		Add2	No						
		Add3							
		Add4							
		Mul1	No						
		Mul2	No						
	0	Mul3	Yes	div.d	R[F2]	R[F0]			#11
		Mul4	No						
		Int1	No						
		Int2	No						
		Int3	No						
		Int4	No						
		Int5	No						

	Dest	Value	Inst	Ready
ROB1	F4	R[F4]	DIV.D F4,F0,F6	Yes
ROB2			S.D F4,16(R1)	Yes
ROB3	R1	R[R1]	DADDI R1,#-24	Yes
ROB4			BNEZ R1,foo	Yes
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11	F2		DIV.D F2,F2,F0	No
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#3

Instruction

	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	44
BNEZ	R1	foo		8	9	10	13 – 13	14	45
L.D	F0	0	R1	9	10	11	14 – 14	15	46
SUB.D	F0	F0	F2	10	11	12	40 – 44	45	47
DIV.D	F2	F2	F0	11	12	13	54 – 68	69	
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15	39 – 53	54	
S.D	F4	16	R1	14	15	16	55 – 55	56	
DADDI	R1	R1	#-24	15	16	41	42 – 42	43	
BNEZ	R1	foo		16	41	42	44 – 44	45	

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	No			
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1	F4	R[F4]	DIV.D F4,F0,F6	Yes
ROB2			S.D F4,16(R1)	Yes
ROB3	R1	R[R1]	DADDI R1,#-24	Yes
ROB4			BNEZ R1,foo	Yes
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11	F2	R[F2]	DIV.D F2,F2,F0	Yes
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Res. Stations

Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
69	Add1	No						
	Add2	No						
	Add3							
	Add4							
	Mul1	No						
	Mul2	No						
	Mul3	No						
	Mul4	No						
	Int1	No						
	Int2	No						
	Int3	No						
	Int4	No						
	Int5	No						

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12	#11	#1		#3

Instruction

		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	44
BNEZ	R1	foo		8	9	10	13 – 13	14	45
L.D	F0	0	R1	9	10	11	14 – 14	15	46
SUB.D	F0	F0	F2	10	11	12	40 – 44	45	47
DIV.D	F2	F2	F0	11	12	13	54 – 68	69	70
L.D	F0	8	R1	12	13	14	15 – 15	16	
DIV.D	F4	F0	F6	13	14	15	39 – 53	54	
S.D	F4	16	R1	14	15	16	55 – 55	56	
DADDI	R1	R1	#-24	15	16	41	42 – 42	43	
BNEZ	R1	foo		16	41	42	44 – 44	45	

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	No			
Store3				
Store4				
Store5				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
70		Add1	No						
		Add2	No						
		Add3							
		Add4							
		Mul1	No						
		Mul2	No						
		Mul3	No						
		Mul4	No						
		Int1	No						
		Int2	No						
		Int3	No						
		Int4	No						
		Int5	No						

	Dest	Value	Inst	Ready
ROB1	F4	R[F4]	DIV.D F4,F0,F6	Yes
ROB2			S.D F4,16(R1)	Yes
ROB3	R1	R[R1]	DADDI R1,#-24	Yes
ROB4			BNEZ R1,foo	Yes
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11				
ROB12	F0	M[8+R1]	L.D F0,8(R1)	Yes

Reg. res.status

	F0	F2	F4	F6	R1
Qi	#12		#1		#3

Instruction

		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	44
BNEZ	R1	foo		8	9	10	13 – 13	14	45
L.D	F0	0	R1	9	10	11	14 – 14	15	46
SUB.D	F0	F0	F2	10	11	12	40 – 44	45	47
DIV.D	F2	F2	F0	11	12	13	54 – 68	69	70
L.D	F0	8	R1	12	13	14	15 – 15	16	71
DIV.D	F4	F0	F6	13	14	15	39 – 53	54	
S.D	F4	16	R1	14	15	16	55 – 55	56	
DADDI	R1	R1	#-24	15	16	41	42 – 42	43	
BNEZ	R1	foo		16	41	42	44 – 44	45	

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	No			
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1	F4	R[F4]	DIV.D F4,F0,F6	Yes
ROB2			S.D F4,16(R1)	Yes
ROB3	R1	R[R1]	DADDI R1,#-24	Yes
ROB4			BNEZ R1,foo	Yes
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11				
ROB12				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
71		Add1	No						
		Add2	No						
		Add3							
		Add4							
		Mul1	No						
		Mul2	No						
		Mul3	No						
		Mul4	No						
		Int1	No						
		Int2	No						
		Int3	No						
		Int4	No						
		Int5	No						

Reg. res.status

	F0	F2	F4	F6	R1
Qi			#1		#3

Instruction

	j	k	IF	ID	IS	EX	WB	CO	
L.D	F0	0	R1	1	2	3	4 - 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 - 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 - 38	39	40
L.D	F0	8	R1	4	5	6	7 - 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 - 23	24	42
S.D	F4	16	R1	6	7	8	25 - 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 - 10	12	44
BNEZ	R1	foo		8	9	10	13 - 13	14	45
L.D	F0	0	R1	9	10	11	14 - 14	15	46
SUB.D	F0	F0	F2	10	11	12	40 - 44	45	47
DIV.D	F2	F2	F0	11	12	13	54 - 68	69	70
L.D	F0	8	R1	12	13	14	15 - 15	16	71
DIV.D	F4	F0	F6	13	14	15	39 - 53	54	72
S.D	F4	16	R1	14	15	16	55 - 55	56	
DADDI	R1	R1	#-24	15	16	41	42 - 42	43	
BNEZ	R1	foo		16	41	42	44 - 44	45	

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	No			
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1				
ROB2				
ROB3	R1	R[R1]	S.D F4,16(R1)	Yes
ROB4			DADDI R1,#-24	Yes
ROB5			BNEZ R1,foo	Yes
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11				
ROB12				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
72		Add1	No						
		Add2	No						
		Add3							
		Add4							
		Mul1	No						
		Mul2	No						
		Mul3	No						
		Mul4	No						
		Int1	No						
		Int2	No						
		Int3	No						
		Int4	No						
		Int5							

Reg. res.status

	F0	F2	F4	F6	R1
Qi					#3

Instruction		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	44
BNEZ	R1	foo		8	9	10	13 – 13	14	45
L.D	F0	0	R1	9	10	11	14 – 14	15	46
SUB.D	F0	F0	F2	10	11	12	40 – 44	45	47
DIV.D	F2	F2	F0	11	12	13	54 – 68	69	70
L.D	F0	8	R1	12	13	14	15 – 15	16	71
DIV.D	F4	F0	F6	13	14	15	39 – 53	54	72
S.D	F4	16	R1	14	15	16	55 – 55	56	73
DADDI	R1	R1	#-24	15	16	41	42 – 42	43	
BNEZ	R1	foo		16	41	42	44 – 44	45	

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	No			
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1				
ROB2				
ROB3	R1	R[R1]	DADDI R1,#-24	Yes
ROB4			BNEZ R1,foo	Yes
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11				
ROB12				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
73		Add1	No						
		Add2	No						
		Add3							
		Add4							
		Mul1	No						
		Mul2	No						
		Mul3	No						
		Mul4	No						
		Int1	No						
		Int2	No						
		Int3	No						
		Int4	No						
		Int5	No						

Reg. res.status

	F0	F2	F4	F6	R1
Qi					#3

Instruction

		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	44
BNEZ	R1	foo		8	9	10	13 – 13	14	45
L.D	F0	0	R1	9	10	11	14 – 14	15	46
SUB.D	F0	F0	F2	10	11	12	40 – 44	45	47
DIV.D	F2	F2	F0	11	12	13	54 – 68	69	70
L.D	F0	8	R1	12	13	14	15 – 15	16	71
DIV.D	F4	F0	F6	13	14	15	39 – 53	54	72
S.D	F4	16	R1	14	15	16	55 – 55	56	73
DADDI	R1	R1	#-24	15	16	41	42 – 42	43	74
BNEZ	R1	foo		16	41	42	44 – 44	45	

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	No			
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1				
ROB2				
ROB3				
ROB4			BNEZ R1,foo	Yes
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11				
ROB12				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
74		Add1	No						
		Add2	No						
		Add3							
		Add4							
		Mul1	No						
		Mul2	No						
		Mul3	No						
		Mul4	No						
		Int1	No						
		Int2	No						
		Int3	No						
		Int4	No						
		Int5	No						

Reg. res.status

	F0	F2	F4	F6	R1
Qi					

Instruction

		j	k	IF	ID	IS	EX	WB	CO
L.D	F0	0	R1	1	2	3	4 – 4	5	6
SUB.D	F0	F0	F2	2	3	4	6 – 10	11	12
DIV.D	F2	F2	F0	3	4	5	24 – 38	39	40
L.D	F0	8	R1	4	5	6	7 – 7	8	41
DIV.D	F4	F0	F6	5	6	7	9 – 23	24	42
S.D	F4	16	R1	6	7	8	25 – 25	26	43
DADDI	R1	R1	#-24	7	8	9	10 – 10	12	44
BNEZ	R1	foo		8	9	10	13 – 13	14	45
L.D	F0	0	R1	9	10	11	14 – 14	15	46
SUB.D	F0	F0	F2	10	11	12	40 – 44	45	47
DIV.D	F2	F2	F0	11	12	13	54 – 68	69	70
L.D	F0	8	R1	12	13	14	15 – 15	16	71
DIV.D	F4	F0	F6	13	14	15	39 – 53	54	72
S.D	F4	16	R1	14	15	16	55 – 55	56	73
DADDI	R1	R1	#-24	15	16	41	42 – 42	43	74
BNEZ	R1	foo		16	41	42	44 – 44	45	75

	Busy	Address	Dest
Load1	No		
Load2	No		
Load3	No		
Load4	No		
Load5			

	Busy	Address	Qi	Dest
Store1	No			
Store2	No			
Store3				
Store4				
Store5				

	Dest	Value	Inst	Ready
ROB1				
ROB2				
ROB3				
ROB4				
ROB5				
ROB6				
ROB7				
ROB8				
ROB9				
ROB10				
ROB11				
ROB12				

Res. Stations

Clock	Time	Name	Busy	Op	Vj	Vk	Qj	Qk	Dest
75		Add1	No						
		Add2	No						
		Add3							
		Add4							
		Mul1	No						
		Mul2	No						
		Mul3	No						
		Mul4	No						
		Int1	No						
		Int2	No						
		Int3	No						
		Int4	No						
		Int5	No						

Reg. res.status

	F0	F2	F4	F6	R1
Qi					