Tutorial - I (Tomasulo's Algorithm)

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	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)			
2	LD F2, 45(R3)			
3	MUL F0, F2, F4			
4	SUB F8, F2, F6			
5	DIV F10, F0, F6			
6	ADD F6, F8, F2			

Consider the above instruction set compromising of 6 instructions. Fill up the table with the cycle number of each operation for all the instructions under the following assumptions.

- The Load, Add/Sub, Mul, Div instructions take 2, 2, 10, 40 cycles respectively. The initial register values of $R2$, $R3$, $F4$ are 100, 200, 2.5 respectively.

- There are total 3 execution units - one for load and store, one for multiplication, and one for addition. The number of reservation stations are 2, 2, 3 for load, multiplication and addition respectively.
- The issue is always done in-order and there can be only one issue at a particular clock cycle. Same Cycle **ISSUE** $\rightarrow$ **DISPATCH** is not allowed.

Cycle Number	0

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)			
2	LD F2, 45(R3)			
3	MUL F0, F2, F4			
4	SUB F8, F2, F6			
5	DIV F10, F0, F6			
6	ADD F6, F8, F2			

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1							
LD2							
ADD1							
ADD2							
ADD3							
MUL1							
MUL2							

Register Status

F0	F2	F4	F6	F8	F10

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	1

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1		
2	LD F2, 45(R3)			
3	MUL F0, F2, F4			
4	SUB F8, F2, F6			
5	DIV F10, F0, F6			
6	ADD F6, F8, F2			

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1		LD		134			
LD2							
ADD1							
ADD2							
ADD3							
MUL1							
MUL2							

Register Status

F0	F2	F4	F6	F8	F10
			LD1		

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	2

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	
2	LD F2, 45(R3)	2		
3	MUL F0, F2, F4			
4	SUB F8, F2, F6			
5	DIV F10, F0, F6			
6	ADD F6, F8, F2			

Register Status

F0	F2	F4	F6	F8	F10
	LD2		LD1		

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1		LD		134			4
LD2		LD		245			
ADD1							
ADD2							
ADD3							
MUL1							
MUL2							

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	3

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	
2	LD F2, 45(R3)	2		
3	MUL F0, F2, F4	3		
4	SUB F8, F2, F6			
5	DIV F10, F0, F6			
6	ADD F6, F8, F2			

Register Status

F0	F2	F4	F6	F8	F10
ML1	LD2		LD1		

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1		LD		134			4
LD2		LD		245			
ADD1							
ADD2							
ADD3							
MUL1		MUL		2.5	LD2		
MUL2							

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	4

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	
2	LD F2, 45(R3)	2		
3	MUL F0, F2, F4	3		
4	SUB F8, F2, F6	4		
5	DIV F10, F0, F6			
6	ADD F6, F8, F2			

Register Status

F0	F2	F4	F6	F8	F10
ML1	LD2		LD1	AD1	

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1		LD		134			4
LD2		LD		245			
ADD1		SUB			LD2	LD1	
ADD2							
ADD3							
MUL1		MUL		2.5	LD2		
MUL2							

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	4

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	
3	MUL F0, F2, F4	3		
4	SUB F8, F2, F6	4		
5	DIV F10, F0, F6			
6	ADD F6, F8, F2			

Register Status

F0	F2	F4	F6	F8	F10
ML1	LD2		LD1	AD1	

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1		LD		134			
LD2		LD		245			
ADD1		SUB		7.1 (assume)	LD2		
ADD2							
ADD3							
MUL1		MUL		2.5	LD2		
MUL2							

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	4

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	
3	MUL F0, F2, F4	3		
4	SUB F8, F2, F6	4		
5	DIV F10, F0, F6			
6	ADD F6, F8, F2			

Register Status

F0	F2	F4	F6	F8	F10
ML1	LD2			AD1	

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1							
LD2		LD		245			
ADD1		SUB		7.1 (assume)	LD2		
ADD2							
ADD3							
MUL1		MUL		2.5	LD2		
MUL2							

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	5

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	
3	MUL F0, F2, F4	3		
4	SUB F8, F2, F6	4		
5	DIV F10, F0, F6	5		
6	ADD F6, F8, F2			

Register Status

F0	F2	F4	F6	F8	F10
ML1	LD2			AD1	ML2

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1							
LD2		LD		245			
ADD1		SUB		7.1 (assume)	LD2		
ADD2							
ADD3							
MUL1		MUL		2.5	LD2		
MUL2		DIV		7.1	MUL1		

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	6

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	
3	MUL F0, F2, F4	3		
4	SUB F8, F2, F6	4		
5	DIV F10, F0, F6	5		
6	ADD F6, F8, F2	6		

Register Status

F0	F2	F4	F6	F8	F10
ML1	LD2		AD2	AD1	ML2

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1							
LD2		LD		245			
ADD1		SUB		7.1 (assume)	LD2		
ADD2		ADD			ADD1	LD2	
ADD3							
MUL1		MUL		2.5	LD2		
MUL2		DIV		7.1	MUL1		

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	6

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	6
3	MUL F0, F2, F4	3		
4	SUB F8, F2, F6	4		
5	DIV F10, F0, F6	5		
6	ADD F6, F8, F2	6		

Register Status

F0	F2	F4	F6	F8	F10
ML1			AD2	AD1	ML2

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1							
LD2		LD		245			
ADD1		SUB	-2.5 (assume)	7.1 (assume)			
ADD2		ADD		-2.5 (assume)	ADD1		
ADD3							
MUL1		MUL	-2.5 (assume)	2.5			
MUL2		DIV		7.1	MUL1		

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	6

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	6
3	MUL F0, F2, F4	3		
4	SUB F8, F2, F6	4		
5	DIV F10, F0, F6	5		
6	ADD F6, F8, F2	6		

Register Status

F0	F2	F4	F6	F8	F10
ML1			AD2	AD1	ML2

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1							
LD2							
ADD1		SUB	-2.5 (assume)	7.1 (assume)			
ADD2		ADD		-2.5 (assume)	ADD1		
ADD3							
MUL1		MUL	-2.5 (assume)	2.5			
MUL2		DIV		7.1	MUL1		

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	7

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	6
3	MUL F0, F2, F4	3	7	
4	SUB F8, F2, F6	4	7	
5	DIV F10, F0, F6	5		
6	ADD F6, F8, F2	6		

Register Status

F0	F2	F4	F6	F8	F10
ML1			AD2	AD1	ML2

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp	
LD1								
LD2								
ADD1		SUB	-2.5 (assume)	7.1 (assume)				9
ADD2		ADD		-2.5 (assume)	ADD1			
ADD3								
MUL1		MUL	-2.5 (assume)	2.5				17
MUL2		DIV		7.1	MUL1			

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	8

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	6
3	MUL F0, F2, F4	3	7	
4	SUB F8, F2, F6	4	7	
5	DIV F10, F0, F6	5		
6	ADD F6, F8, F2	6		

Register Status

F0	F2	F4	F6	F8	F10
ML1			AD2	AD1	ML2

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp	
LD1								
LD2								
ADD1		SUB	-2.5 (assume)	7.1 (assume)				9
ADD2		ADD		-2.5 (assume)	ADD1			
ADD3								
MUL1		MUL	-2.5 (assume)	2.5				17
MUL2		DIV		7.1	MUL1			

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	9

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	6
3	MUL F0, F2, F4	3	7	
4	SUB F8, F2, F6	4	7	9
5	DIV F10, F0, F6	5		
6	ADD F6, F8, F2	6		

Register Status

F0	F2	F4	F6	F8	F10
ML1			AD2		ML2

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp	
LD1								
LD2								
ADD1		SUB	-2.5	7.1				9
ADD2		ADD	-9.6	-2.5				
ADD3								
MUL1		MUL	-2.5	2.5				17
MUL2		DIV		7.1	MUL1			

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	9

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	6
3	MUL F0, F2, F4	3	7	
4	SUB F8, F2, F6	4	7	9
5	DIV F10, F0, F6	5		
6	ADD F6, F8, F2	6		

Register Status

F0	F2	F4	F6	F8	F10
ML1			AD2		ML2

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1							
LD2							
ADD1							
ADD2		ADD	-9.6	-2.5			
ADD3							
MUL1		MUL	-2.5	2.5			
MUL2		DIV		7.1	MUL1		

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	10

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	6
3	MUL F0, F2, F4	3	7	
4	SUB F8, F2, F6	4	7	9
5	DIV F10, F0, F6	5		
6	ADD F6, F8, F2	6	10	

Register Status

F0	F2	F4	F6	F8	F10
ML1			AD2		ML2

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp	
LD1								
LD2								
ADD1								
ADD2		ADD	-9.6	-2.5				12
ADD3								
MUL1		MUL	-2.5	2.5				17
MUL2		DIV		7.1	MUL1			

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	11

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	6
3	MUL F0, F2, F4	3	7	
4	SUB F8, F2, F6	4	7	9
5	DIV F10, F0, F6	5		
6	ADD F6, F8, F2	6	10	

Register Status

F0	F2	F4	F6	F8	F10
ML1			AD2		ML2

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp	
LD1								
LD2								
ADD1								
ADD2		ADD	-9.6	-2.5				12
ADD3								
MUL1		MUL	-2.5	2.5				17
MUL2		DIV		7.1	MUL1			

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	12

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	6
3	MUL F0, F2, F4	3	7	
4	SUB F8, F2, F6	4	7	9
5	DIV F10, F0, F6	5		
6	ADD F6, F8, F2	6	10	12

Register Status

F0	F2	F4	F6	F8	F10
ML1					ML2

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp	
LD1								
LD2								
ADD1								
ADD2		ADD	-9.6	-2.5				12
ADD3								
MUL1		MUL	-2.5	2.5				17
MUL2		DIV		7.1	MUL1			

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	12

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	6
3	MUL F0, F2, F4	3	7	
4	SUB F8, F2, F6	4	7	9
5	DIV F10, F0, F6	5		
6	ADD F6, F8, F2	6	10	12

Register Status

F0	F2	F4	F6	F8	F10
ML1					ML2

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1							
LD2							
ADD1							
ADD2							
ADD3							
MUL1		MUL	-2.5	2.5			
MUL2		DIV		7.1	MUL1		

17

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	17

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	6
3	MUL F0, F2, F4	3	7	17
4	SUB F8, F2, F6	4	7	9
5	DIV F10, F0, F6	5		
6	ADD F6, F8, F2	6	10	12

Register Status

F0	F2	F4	F6	F8	F10
					ML2

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1							
LD2							
ADD1							
ADD2							
ADD3							
MUL1		MUL	-2.5	2.5			
MUL2		DIV	-6.25	7.1			

17

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	17

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	6
3	MUL F0, F2, F4	3	7	17
4	SUB F8, F2, F6	4	7	9
5	DIV F10, F0, F6	5		
6	ADD F6, F8, F2	6	10	12

Register Status

F0	F2	F4	F6	F8	F10
					ML2

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1							
LD2							
ADD1							
ADD2							
ADD3							
MUL1							
MUL2		DIV	-6.25	7.1			

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	18

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	6
3	MUL F0, F2, F4	3	7	17
4	SUB F8, F2, F6	4	7	9
5	DIV F10, F0, F6	5	18	
6	ADD F6, F8, F2	6	10	12

Register Status

F0	F2	F4	F6	F8	F10
					ML2

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1							
LD2							
ADD1							
ADD2							
ADD3							
MUL1							
MUL2		DIV	-6.25	7.1			58

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	58

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	6
3	MUL F0, F2, F4	3	7	17
4	SUB F8, F2, F6	4	7	9
5	DIV F10, F0, F6	5	18	58
6	ADD F6, F8, F2	6	10	12

Register Status

F0	F2	F4	F6	F8	F10

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1							
LD2							
ADD1							
ADD2							
ADD3							
MUL1							
MUL2		DIV	-6.25	7.1			

58

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Cycle Number	58

Load: 2 Cycles
Add: 2 Cycles
Mul: 10 Cycles
Div: 40 Cycles

Initial Values:
R2 is 100
R3 is 200
F4 is 2.5

F0	-6.25
F2	-2.5
F6	-12.1
F8	-9.6
F10	-0.88

Cycle number of each operation

	Instructions	Issue	Execute	Write
1	LD F6, 34(R2)	1	2	4
2	LD F2, 45(R3)	2	4	6
3	MUL F0, F2, F4	3	7	17
4	SUB F8, F2, F6	4	7	9
5	DIV F10, F0, F6	5	18	58
6	ADD F6, F8, F2	6	10	12

Reservation Station Table

	Busy	Operation	V_j	V_k	Q_j	Q_k	Disp
LD1							
LD2							
ADD1							
ADD2							
ADD3							
MUL1							
MUL2							

Register Status

F0	F2	F4	F6	F8	F10

V_j : Value for the first operand
V_k : Value for the second operand
Q_j : Waiting for the first operand
Q_k : Waiting for the second operand

Thank You [1]

[1] Most of the material are taken from the famous book on Comp Arch by Hen/Pat, Comp Arch course by Milos Prvulovic for teaching purposes