JN Instruction Set

ADD	In a toward in a	Description	Effects on SR				0	2 "	F		0:	
ADD	Instruction	Description	- - - N Z C V			V	Syntax	Operation	Example	Cycles	Size	Pipe
ADD X SUB SUB C V SUB Ra, Rb, Rc Ra = Ra - Rc SUB A, R2 1 2 3 SUB X SUB N C V SUB Ra, Rb, Rc Ra = Ra - Rb SUB A, R2 1 2 2 3 SUB X MUL C V SUB Ra, Rb, Rc Ra = Ra - Rc SUB Ra, A, R2 2 3 3 MUL SUB Ra, Rb, Rc Ra = Ra - Rc SUB Ra, A, R2 2 3 3 MUL SUB Ra, Rb, Rc Ra = Ra - Rc SUB Ra, A, R2 2 3 3 MUL SUB Ra, A, R2 3 2 3 MUL SUB Ra, RB SUB Ra = Ra P. Rc MUL SUB Ra, RB MUL SUB Ra, RB SUB Ra = Ra P. Rc MUL SUB Ra, RB MUL SUB Ra, RB SUB Ra = Ra P. Rc MUL SUB Ra, RB SUB Ra = Ra P. Rc MUL SUB Ra, RB SUB Ra = Ra P. Rc MUL SUB Ra, RB SUB Ra = Ra P. Rc MUL SUB Ra, RB SUB Ra = Ra P. Rc MUL SUB Ra, RB SUB Ra = Ra P. Rc MUL SUB Ra, RB SUB Ra = Ra P. Rc MUL SUB Ra, RB SUB Ra = Ra P. Rc MUL SUB Ra, RB SUB Ra = Ra P. Rc MUL SUB Ra, RB SUB Ra = Ra P. Rc MUL SUB Ra, RB SUB Ra = Ra P. Rc MUL SUB Ra, RB SUB Ra = Ra P. Rc SUB Ra, RB SUB Ra SUB Ra = Ra P. Rc MUL SUB Ra, RB SUB Ra = Ra P. Rc SUB Ra SUB Ra SUB Ra = Ra P. Rc SUB Ra SUB Ra = Ra P. Rc SUB Ra SUB Ra SUB Ra = Ra P. Rc SUB Ra SUB Ra SUB Ra = Ra P. Rc SUB Ra SUB Ra SUB Ra = Ra P. Rc SUB Ra SUB R							Arithmetic Operatio	ns				
C V SUB Ra, Rb	ADD				С	V	ADD Ra, Rb	Ra = Ra + Rb	ADD X, R1	1	2	
SUB X	ADD.X				С			Ra = Rb + Rc	ADD R0, R1, R2	2	3	
MUL X MUL X DIV Unsigned division DIV Unsigned division DIV Unsigned division DIV Unsigned division DIV Unsigned extended division DIV S D DIV S	SUB								SUB A, R2	1	2	
MULX	SUB.X							Ra = Rb – Rc	SUB R3, A, R2	2	3	
DIV Unsigned division	MUL							Ra = Ra x Rb	MUL R0, R1	4	2	
DIV X Unsigned extended division DIV Ra, Rb, Rc Ra = Ra / Rc DIV A, R0, R1 17 3 MOD MOD MOD MOD MOD MOD R, R1 20 20 20 MOD MOD R, R1 20 DIV Ra, Rb Ra = Ra + Rb / Rc MOD R, R1 20 20 20 MOD R, R1 MOD R, R2 MOD R, R3 MOD R, R4 MOD R, R3 MOD R, R4 MOD R, R4 MOD R, R4 MOD R, R4	MUL.X				С	V	MUL Ra, Rb, Rc	Ra = Rb x Rc	MUL R0, R1, R2			
MOD	DIV	Unsigned division					DIV Ra, Rb	Ra = Ra / Rb	DIV R0, R1			
NCC	DIV.X	Unsigned extended division					DIV Ra, Rb, Rc	Ra = Rb / Rc	DIV A, R0, R1			
N Z V DEC Ra	MOD						DIV Ra, Rb	Ra = Ra % Rb	MOD R0, R1	20	2	
AND Bitwise ANDs operands AND Ra, Rb Ra = Ra & Rb 1 2	INC			Z		V	INC Ra	Ra = Ra + 1	INC R1	4		
AND Bitwise ANDs operands	DEC			N Z		V	DEC Ra	Ra = Ra – 1	DEC R1	4	2	
OR Ra, Rb Ra = Ra Rb												
XOR Ra, Rb Ra = Ra ^ Rb 1 2	AND	Bitwise ANDs operands								1	2	
NOT Ra	OR						OR Ra, Rb	Ra = Ra Rb		1	2	
SHL Ra, Rb Ra = Ra < Rb 2 2	XOR						XOR Ra, Rb	Ra = Ra ^ Rb		1	2	
SHR Ra, Rb Ra = Ra >> Rb 2 2 2	NOT						NOT Ra	Ra = ~Ra		1	2	
Transfer	SHL						SHL Ra, Rb	Ra = Ra << Rb			2	
LD Ra, #0x12 Ra = 0x12 1 3	SHR						SHR Ra, Rb	Ra = Ra >> Rb		2	2	
LD LD Ra, #0x1213 Ra = 0x1213 1 4							Transfer					
LD Ra, #0x12131415 Ra = 0x12131415 1 6 LD Ra, 0x12131415 Ra = MEM[0x12131415] 4 6 LD Ra, 0x12131415 Ra = MEM[0x12131415] 6 6 LD Ra, 0x12131415 Ra = MEM[0x12131415] 7 LD Ra, 0x12131415 Ra = MEM[0x12131415] 7 LD Ra, 0x12131415 MEM[0x12131415] Ra 4 6 ST Ra, 0x12131415 MEM[0x12131415] Ra 4 6 ST Ra, 0x12131415 MEM[0x12131415] Ra 6 RET Ra Ra Ra Ra Ra Ra Ra R	LD						LD Ra, #0x12	Ra = 0x12		1	3	
LD Ra, 0x12131415 Ra = MEM[0x12131415] 4 6	LD						LD Ra, #0x1213	Ra = 0x1213		1	4	
LD Ra, '0x12131415	LD						LD Ra, #0x12131415	Ra = 0x12131415		1	6	
LD Ra, 0x12 + A X Y SP PC Ra = MEM[0x12 + A X Y SP PC] 5 3	LD						LD Ra, 0x12131415	Ra = MEM[0x12131415]		4	6	
LD Ra, 0x1213 + A X Y SP PC Ra = MEM[0x1213 + A X Y SP PC] 5 4	LD						LD Ra, *0x12131415	Ra = MEM[MEM[0x12131415]]		6	6	
LD Ra, 0x1213 + A X Y SP PC Ra = MEM[0x1213 + A X Y SP PC] 5 4	LD						LD Ra, 0x12 + A X Y SP PC	Ra = MEM[0x12 + A X Y SP PC]		5	3	
ST Ra, 0x12131415 MEM[0x12131415] = Ra	LD						LD Ra, 0x1213 + A X Y SP PC	Ra = MEM[0x1213 + A X Y SP PC]		5	4	
ST Ra, 0x12 + A X Y SP PC MEM[0x12 + A X Y SP PC] = Ra 5 3 ST Ra, 0x1213 + A X Y SP PC MEM[0x1213 + A X Y SP PC] = Ra 5 4 MOV MOV Ra, Rb Ra = Rb 1 2 Subroutines CALL Ra PC = Ra 6 2 FLUS RET RET RET	ST						ST Ra, 0x12131415			4	6	
ST Ra, 0x1213 + A X Y SP PC MEM[0x1213 + A X Y SP PC] = Ra 5 4	ST						ST Ra, *0x12131415	MEM[MEM[0x12131415] = Ra		6	6	
MOV Ra, Rb Ra = Rb 1 2 Subroutines Subroutines CALL Ra PC = Ra 6 2 FLUS FLUS FLUS FLUS FLUS FLUS FLUS FLUS FLUS FLUS FLUS	ST						ST Ra, 0x12 + A X Y SP PC	MEM[0x12 + A X Y SP PC] = Ra		5	3	
CALL CALL Ra PC = Ra 6 2 FLUS RET RET Test { Ra - Rb } JE JE JE JE Ra If IV JOHN	ST						ST Ra, 0x1213 + A X Y SP PC	MEM[0x1213 + A X Y SP PC] = Ra		5	4	
CALL CALL Ra PC = Ra 6 2 FLUS RET RET 1 FLUS Branching CMP N Z C V CMP Ra, Rb Test { Ra – Rb } 1 2 JE JE Ra if Z then PC = Ra 1 2 FLUS JNE JNE Ra if !N and !Z then PC = Ra 1 2 FLUS JG JG Ra if !N then PC = Ra 1 2 FLUS JGE JGE Ra if !N then PC = Ra 1 2 FLUS JL JL Ra if N and !Z then PC = Ra 1 2 FLUS JLE JLE Ra if N then PC = Ra 1 2 FLUS JMP JMP Ra PC = Ra 1 2 FLUS	MOV						MOV Ra, Rb	Ra = Rb		1	2	
RET							Subroutines					
CMP	CALL							PC = Ra		6	2	FLUSH
CMP N Z C V CMP Ra, Rb Test { Ra – Rb } 1 2 JE JE Ra if Z then PC = Ra 1 2 FLUS JNE JNE Ra if !Z then PC = Ra 1 2 FLUS JG JG Ra if !N and !Z then PC = Ra 1 2 FLUS JGE JGE Ra if !N then PC = Ra 1 2 FLUS JL JL Ra if N and !Z then PC = Ra 1 2 FLUS JLE JLE Ra if N then PC = Ra 1 2 FLUS JMP JMP Ra PC = Ra 1 2 FLUS	RET						RET				1	FLUSH
JE JE Ra if Z then PC = Ra 1 2 FLUS JNE JNE Ra if !Z then PC = Ra 1 2 FLUS JG JG Ra if !N and !Z then PC = Ra 1 2 FLUS JGE JGE Ra if !N then PC = Ra 1 2 FLUS JL JL Ra if N and !Z then PC = Ra 1 2 FLUS JLE JLE Ra if N then PC = Ra 1 2 FLUS JMP JMP Ra PC = Ra 1 2 FLUS Misc							Branching					
JNE JNE Ra if !Z then PC = Ra 1 2 FLUS JG JG Ra if !N and !Z then PC = Ra 1 2 FLUS JGE JGE Ra if !N then PC = Ra 1 2 FLUS JL JL Ra if N and !Z then PC = Ra 1 2 FLUS JLE JLE Ra if N then PC = Ra 1 2 FLUS JMP JMP Ra PC = Ra 1 2 FLUS Misc	CMP			N Z	С	V	CMP Ra, Rb	Test { Ra – Rb }		1	2	
JG JG Ra if !N and !Z then PC = Ra 1 2 FLUS JGE JGE Ra if !N then PC = Ra 1 2 FLUS JL JL Ra if N and !Z then PC = Ra 1 2 FLUS JLE JLE Ra if N then PC = Ra 1 2 FLUS JMP JMP Ra PC = Ra 1 2 FLUS Misc	JE						JE Ra	if Z then PC = Ra		1	2	FLUSH
JG JG Ra if !N and !Z then PC = Ra 1 2 FLUS JGE JGE Ra if !N then PC = Ra 1 2 FLUS JL JL Ra if N and !Z then PC = Ra 1 2 FLUS JLE JLE Ra if N then PC = Ra 1 2 FLUS JMP JMP Ra PC = Ra 1 2 FLUS Misc	JNE						JNE Ra	if !Z then PC = Ra		1	2	FLUSH
JL JL Ra if N and !Z then PC = Ra 1 2 FLUS JLE JLE Ra if N then PC = Ra 1 2 FLUS JMP JMP Ra PC = Ra 1 2 FLUS Misc	JG						JG Ra	if !N and !Z then PC = Ra		1	2	FLUSH
JLE JLE Ra if N then PC = Ra 1 2 FLUS JMP JMP Ra PC = Ra 1 2 FLUS Misc	JGE						JGE Ra	if !N then PC = Ra		1	2	FLUSH
JLE JLE Ra if N then PC = Ra 1 2 FLUS JMP JMP Ra PC = Ra 1 2 FLUS Misc	JL						JL Ra	if N and !Z then PC = Ra		1	2	FLUSH
JMP	JLE						JLE Ra	if N then PC = Ra		1		FLUSH
Misc	JMP						JMP Ra	PC = Ra		1		FLUSH
								<u></u>				
	NOP				T		NOP			1	1	