CISC CODE
START   ADD A, B, C
ADD D, E, F
ADD C, F, G
BRZ ISZERO
BRN ISNEG
ADD F, G, C
BR END
ISZERO ADD F, J, C
BR END
ISNEG   ADD G, J, C
END   STOP

LAB4-CH13- ORIGINAL CICS SOURCE CODE

STEP1 CISC to RISC

LABEL	OPERATION	OPERANDS
START	LR1	A
	LR2	B
	ADD	R1, R2, R3
	STR3	C
	LR1	D
	LR2	E
	ADD	R1,R2,R3
	STR3	F
	LR1	C
	LR2	F
	ADD	R1,R2,R3
	STR3	G
BRZ	Branch ISZERO	
BRN	Branch ISNEG	
	LR1	F
	LR2	G
	ADD	R1,R2,R3
	STR3	C
BR	BR END	
ISZERO	LR1	F
	LR2	J
	ADD	R1,R2,R3
	STR3	C
BR	BR END	
ISNEG	LR1	G
	LR2	J
	ADD	R1,R2,R3
	STR3	C
END	STOP	

STEP2a Register Time Usage and renaming and load/store change/removal

LABEL	OPERATION	OPERANDS	R1	R2	R3
START	LR1	A	A		
	LR2	B		B	
	ADD	R1, R2, R3			C
	~~STR3~~	~~C~~			
	LR1	D	D		
	LR2	E		E	
	ADD	R1,R2,R3			
	~~STR3~~	~~F~~			F
	~~LR1~~	~~C~~	C		
	~~LR2~~	~~F~~		F	
	ADD	R1,R2,R3			G
	~~STR3~~	~~G~~			
	BR ISZERO				
	BR ISNEG				
	~~LR1~~	~~F~~	F		
	~~LR2~~	~~G~~		G	
	ADD	R1,R2,R3			C
	~~STR3~~	~~C~~			
BR	BR END				
ISZERO	~~LR1~~	~~F~~	F		
	~~LR2~~	J		J	
	ADD	R1,R2,R3			C
	~~STR3~~	~~C~~			
	BR END				
ISNEG	~~LR1~~	~~G~~	G		
	LR2	J		J	
	ADD	R1,R2,R3			C
	~~STR3~~	~~C~~			
END	STOP				

STEP2b Final OPTIMIZED CODE

LABEL	OPERATION	OPERANDS	R1	R2	R3
START	LR1	A	A		
	LR2	B		B	
	ADD	R1, R2, R3			**C**
	LR1	D	D		
	LR2	E		E	
	ADD	R1,R2,R2		**F**	
	ADD	R2,R3,R1	G		
	STR1	G			
	STR2	F			
	BRZ ISZERO				
	BRN ISNEG				
	ADD	R1,R2,R3			C
	BR END				
ISZERO	LR1	J	J		
	ADD	R1,R2,R3			C
	BR END				
ISNEG	LR2	J		J	
	ADD	R1,R2,R3			C
END	STR3	C			
	STOP	STOP			

CISC CODE RESULTS for 3 sets of VARIABLE VALUES

CISC CODE	1: A=1, B=2, D=3, E=4, J=1	2: A=1, B=2, D=3, E=-6, J=1	3: A=1, B=2, D=3, E=-8, J=1
START ADD A, B, C	C=3	C=3	C=3
ADD D, E, F	F=7	F=-3	F=-5
ADD C, F, G	G=10	G=0	G=-2
BRZ ISZERO	NOT TAKEN	TAKEN	NOT TAKEN
BRZ ISNEG	NOT TAKEN		TAKEN
ADD F, G, C	C=17		
BR END	TAKEN		
ISZERO ADD F, J, C		C=-2	
BR END		TAKEN	
ISNEG ADD G, J, C			C=-1
END STOP			
FINAL VALUES>	**C=17, F=7, G=10**	**C=-2, F=-3, G=0**	**C=-1, F=-5, G=-2**

OPTIMIZED RISC CODE RESULTS for 3 sets of VARIABLE VALUES

OPTIMIZED RISC CODE	1: A=1, B=2, D=3, E=4, J=1	2: A=1, B=2, D=3, E=-6, J=1	3: A=1, B=2, D=3, E=-8, J=1
START LR1 A			
LR2 B			
ADD R1, R2, R3	R3=3	R3=3	R3=3
LR1 D			
LR2 E			
ADD R1,R2,R2	R2=7 (f)	R2=-3 (F)	R2=-5 (F)
ADD R2,R3,R1	R1=10(G)	R1=0 (G)	R1=-2 (G)
BRZ ISZERO	NOT TAKEN	TAKEN	NOT TAKEN
BRN ISNEG	NOT TAKEN	NOT TAKEN	TAKEN
ADD R1,R2,R3	R3=17 (C)		
BR END	Correct answers		
ISZERO LR1 J		R1=1	
ADD R1,R2,R3		R3=-2 (C)	
BR END		Correct answers	
ISNEG LR2 J			R2=1
ADD R1,R2,R3			R3=-1 (C)
			Correct answer
STOP	end	end	end
FINAL VALUES>	**C=17, F=7, G=10**	**C=-2, F=-3, G=0**	**C=-1, F=-5, G=-2**