

**CS 302 - Systems Programming**  
**Problem 2.2.3**

FIRST PASS

Loc/Block		Source Statements		SYMTAB
0000	SUM	START	0	
0000	FIRST	LDX	#0	FIRST 000000
0003		LDA	#0	
0006		+LDB	#TABLE2	
		BASE	TABLE2	
000A	LOOP	ADD	TABLE,X	LOOP 00000A
000D		ADD	TABLE2,X	
0010		TIX	COUNT	
0013		JLT	LOOP	
0016		+STA	TOTAL	
001A		RSUB		
001D	COUNT	RESW	1	COUNT 00001D
0020	TABLE	RESW	2000	TABLE 000020
1790	TABLE2	RESW	2000	TABLE2 001790
2F00	TOTAL	RESW	1	TOTAL 002F00
		END	FIRST	

After first pass: LOCCTR = 2F03, LENGTH = 2F03 - 0000 = 2F03

SECOND PASS

Loc/Block		Source Statements	OC	nixbpe	Relative Address
0000	SUM	START	0		
0000	FIRST	LDX	#0	04	010000
0003		LDA	#0	00	010000
0006		+LDB	#TABLE2	68	010001 1790
		BASE	TABLE2		
000A	LOOP	ADD	TABLE,X	18	111010 020-00A=016
000D		ADD	TABLE2,X	18	111010 1790-0010=1780(*)
					111100 1790-1790=0000
0010		TIX	COUNT	2C	110010 01D-013=00A
0013		JLT	LOOP	38	110010 00A-016=114(+)
0016		+STA	TOTAL	0C	110001 2F00
001A		RSUB		4C	110000
001D	COUNT	RESW	1		
0020	TABLE	RESW	2000		
1790	TABLE2	RESW	2000		
2F00	TOTAL	RESW	1		
		END	FIRST		

Notes: (\*) Since the PC relative address needs 4 digits and we are using format 3 we need to compute Base Relative (following line)

(+) For negative values we use 2's complement notation (00A-016=-00C)

Object Code

HSUM 000000002F03

T0000001D050000010000691017901BA0161BC0002F200A3B21140F102F004F0000

M00000705

M00001705

E000000