

EE 308 – Homework 3

Due Feb. 7, 2005

1. Disassemble the following HC12 op codes:

D6 22 73 20 A4 18 16 27 F9 3F

Indicate what instructions these bytes correspond to. For each instruction indicate the addressing mode which is used.

2. Repeat Problem 1 for the following op codes:

B7 F6 18 03 A2 17 21 5A A6 2E 04 B6 F5

3. Which of the conditional branch instructions in the following list will cause a branch to be taken if the condition code flags are: N=1, Z=0, V=0, C=1:

- (a) BCC label
- (b) BNE label
- (c) BGE label
- (d) BGT label
- (e) BHI label
- (f) BMI label
- (g) BLS label

4. Below shows a sequence of instructions to be executed by a 68HCS12. Fill in the table, showing the value in accumulator A and the state of the condition flags N, Z, V and C after each instruction. The table shows the initial value of the condition flags and A

Instruction	Accumulator A	N	Z	V	C
	\$00	1	0	1	0
TSTA					
ADDA #\$40					
SUBA #\$78					
LSLA					
ROLA					
ADDA #\$CF					

5. Consider an array of 8-bit data located in memory with a starting address of \$2000 and an ending address of \$201F. Write a program which will swap the first element of the array with the last element; the second element with the next-to-last element, etc.
6. Write a program to count the number of odd 16-bit numbers in a table of data. The starting address of the table is \$8000, and there are \$2000 numbers in the table. The numbers signed. The program should write the count into memory location \$2000.
7. Write a program to compute the average on a table of N 8-bit unsigned numbers starting at address \$C000 and store the result at address \$2000. N is no larger than 255. (Hint: Use the ABX or ABY instruction to hold the sum, and the IDIV instruction to do the division.)