Homework 8

1. Hand assemble the following program: You must indicate the low and high byte at each program memory location using the correct endianness:

**.ORG 0**

**1) LDI R19,0x5 ;R19 = 5 (R19 for counter)**

**2) LDI R16,0x55         ;load R16 with value 0x55 (value to be copied)**

**3) LDI YL,0x40 ;load the low byte of Y with value 0x40**

**4) LDI YH,0x1 ;load the high byte of Y with value 0x1**

**L1: 5) ST Y,R16 ;copy R16 to memory location 0x140**

**6) INC YL         ;increment the low byte of Y**

**7) DEC R19         ;decrement the counter**

**8) BRNE  L1         ;loop until counter = zero**

Low Byte - High Byte

1. 0011 0101 1110 0000
2. 0000 0101 1110 0101
3. 1100 0000 1110 0100
4. 1101 0001 1110 0000
5. 0000 1000 1000 0011
6. 1100 0011 1001 0101
7. 0011 1010 1001 0101
8. 1110 1001 1111 0111

2. Hand assemble the following program: You must indicate the low and high byte at each program memory location using the correct endianness:

**.ORG  0                  ;burn into ROM starting at 0**

**1) LDI ZL, lo8(MYDATA<<1)   ;R30 = 00 low-byte addr**

**2) LDI ZH, hi8(MYDATA<<1)   ;R31 = 0A, high-byte addr**

**3) LDI XL, lo8(0x140)       ;R26 = 40, low-byte RAM address**

**4) LDI XH, hi8(0x140)       ;R27 = 1, high-byte RAM address**

**AGAIN:**

**5) LPM R16, Z+     ;read the table, then increment Z**

**6) CPI R16,0       ;compare R16 with 0**

**7) BREQ END       ;exit if end of string**

**8) ST X+, R16      ;store R16 in RAM and inc X**

**9) RJMP  AGAIN**

**END:**

**10) RJMP END**

**.ORG 0x500          ;data burned starting at 0x500**

**MYDATA: .byte "The Promise of World Peace",0**

Low Byte - High Byte

1. 1110 0110 1110 0000
2. 1111 1111 1110 0000
3. 1100 0111 1110 0000
4. 1101 1001 1110 0000
5. 0110 0101 1001 0001
6. 0110 0000 0011 1000
7. 1110 0001 1111 0011
8. 0000 1101 1001 0001
9. 1100 0000 1100 1111
10. 0000 0000 1100 1000