Lab: 02

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1.6.1 Write each of the following Decimal Numbers in Binary

a) 2 = **00000010**

b) 7 = **00000111**

c) 9 = **00001001**

d) 13 = **00001101**

e) 27 = **00011011**

f) 62 = **00111110**

1.6.2 Write each of the following Binary Numbers in Decimal

a) 00001010 = **10**

b) 00001111 = **15**

c) 00101000 = **40**

d) 01010111 = **87**

e) 10000000 = **128**

f) 11000111 = **199**

1.6.3 Write each of the following Binary Numbers in Hexadecimal

a) 00001010 = **0A**

b) 00001111 = **0F**

c) 00101000 = **28**

d) 01010111 = **57**

e) 10000000 = **80**

f) 11000111 = **C7**

1.6.4 Write each of the following Hexadecimal Numbers in Binary

a) 0B = **00001011**

b) 4C = **01001100**

c) AF = **10101111**

d) 3D15 = **0011110100010101**

e) 6E70 = **0110111001110000**

f) 8A9B = **1000101010011011**

1.6.5 Write each of the following Hexadecimal Numbers in Decimal

a) 0B = **11**

b) 4C = **76**

c) AF = **175**

d) 3D15 = **15637**

e) 6E70 = **28272**

f) 8A9B = **35483**

1.6.7 Write each of the following Integers in 8-bit 2's Complement Notation

a) -1 = **11111111**

b) -17 = **11101111**

c) -19 = **11101101**

d) -62 = **11000010**

e) +127 = **01111111**

f) -128 = **10000000**

1.6.8 Write each of the following 8-bit Signed Binary Integers in Decimal

a) 01011100 = **92**

b) 11011100 = **-36**

c) 10001111 = **-113**

d) 01111110 = **126**

e) 10010001 = **-111**

f) 10000000 = **-128**

1.6.9 Indicate the sign for each of the following 16-bit signed hex integers

a) 7FB9 = **Positive**

b) D000 = **Negative**

c) 8123 = **Negative**

d) 6FFF = **Positive**

1.6.10 Write each of the following signed integers as 16-bit hexadecimal value

a) -1 = **FFFF**

b) -127 = **FF81**

c) -256 = **FF00**

d) -8193 = **E001**

1.6.11 Largest and Smallest

a) Largest positive 8-bit value:

- Binary: **01111111**
- Hexadecimal: **7F**
- Decimal: **127**

b) Smallest negative 8-bit value:

- Binary: **10000000**
- Hexadecimal: **80**

- Decimal: **-128**

c) Largest positive 16-bit value:

- Binary: **0111111111111111**
- Hexadecimal: **7FFF**
- Decimal: **32767**

d) Smallest negative 16-bit value:

- Binary: **1000000000000000**
- Hexadecimal: **8000**
- Decimal: **-32768**

Review Questions

1. **Name four software tools used for assembly language programming:**
    - Assembler
    - Linker
    - Debugger
    - Text Editor
2. **What is an assembler?** An assembler is a tool that converts assembly language code into machine code.
3. **What is a linker?** A linker is a tool that combines various pieces of compiled code into a single executable program.
4. **What is a debugger?** A debugger is a tool that helps in testing and debugging programs by allowing the user to execute and inspect the program step by step.