Activity – Vole Instructions

While completing this activity you will need to reference Appendix C in your textbook.

Activity One – Reading Vole Instructions

The following are computer instructions written in the Vole machine language. Using Appendix C in your book, translate these instructions to English.

1. 0x7123

   OR the bit patterns in registers 0x2 and 0x3 putting the result in register 0x1

2. 0x40E1

   MOVE the bit pattern found in register 0xE to register 0x1

3. 0xA304

   ROTATE the bit pattern found in register 0x3 one bit to the right 4 times. Each time, place the bit that started at the low-order end at the high-order end.

4. 0xB100

   JUMP to the instruction located in the memory cell at address 0x00 if the bit pattern in register 0x1 is equal to the bit pattern in register 0x0.

5. 0x2BCD

   LOAD the register 0xB with the bit pattern 0xCD

6. 0x1739

   LOAD the register 0x7 with the bit pattern found in the memory cell whose address is 0x39

7. 0x3C2A

   STORE the bit pattern found in register 0xC in the memory cell whose address is 0x2A

8. 0xC000

   HALT execution of the program.

9. What is the difference between 0x1456 and 0x2456?

   The first looks at what is currently in memory cell 0x56 and places its contents into register 0x4. The second puts the value 0x56 into register 0x4. The first can put a wide variety of things into register 0x4. The second can only put in one value – 0x56.

Activity Two – Writing Vole Instructions

Translate the following instructions from English to Vole

1. LOAD register 0x6 with the value 0x77

0x2677

2. LOAD register 0x6 with the contents of memory cell 0x77

0x1677

3. JUMP to the instruction at memory location 0x24 if the contents of register 0x0 equals the value in register 0xA

0xBA24

4. AND the contents of registers 0xE and 0x2 leaving the result in register 0x1

0x81E2 (Technically it could also be 0x812E but I think this is less correct).

5. MOVE the bit pattern found in register 0x7 to register 0xC

0x407C

6. STORE the bit pattern found in register 0xA in the memory cell whose address is 0x27

0x3A27

Activity Three – Considering Vole Instructions

Classify each of the following Vole instructions int terms of whether its execution:

- changes the contents of the memory cell at location 0x3C
- retrieves the contents of the memory cell at location 0x3C
- is independent of the contents of the memory cell at location 0x3C

1. 0x353C

Changes

2. 0x253C

Independent

3. 0x3C3C

Changes

4. 0x403C

Independent

5. 0x153C

Retrieves