

1.6 Exercises 4, 5, 9, 10, 12, 13, 14

4. 2^{16} 65,536

0000 0000 0000 0000

0111 1111 1111 1111 + 65,535, -65,536

unsigned largest = 65,536

unsigned smallest = 0

5. 1001110011101110

0x 9 C E E

0110 0011 0001 0001

+

0110 0011 0001 0010 = -25362

1111 1111 1111 1111

F F F F

0000 0000 0000 0001 = -1

0000 0000 1111 1111 = 255

0 0 F F

0100 1000 1000 0100 = 18,564

4 8 8 4

1111 1111 0000 0000

F F 0 0

0060 0000 1111 1111

+ 1

0000 0001 0000 0000 = -256

1100 1010 1111 1110

C A F E

0011 0101 0000 0001 = -

-13569

9. "Fred"

46 72 65 64

10. 0x45617379 = Easy

12. Because the underlying mnemonics within the machine code are mutually exclusive to that one platform.

13. The virtual machine emulates a chipset, allowing standard programming languages to be interpreted uniformly across all the computers that specific virtual machine was developed for.

14. They are slower than machine code being executed specifically designed for that chipset.