

2. (100 points) Convert the following values using what we have learned about binary (base 2) and hexadecimal (base 16). Show your work for each.

- a.[25] Convert the base 10 number 81 to base 2.
- b.[25] Convert the base 2 number 1110111 to base 10.
- c.[25] AC99C1 represents a hex code for a very nice shade of lilac in base 16. Underline and identify which portions of the hex code correspond to the R, G, B (red, green, blue) values. Convert the R, G, and B values to base 10 and label each.
- d.[25] 226, 143, 173 represents the base 10 R, G, B values for a lovely shade of coral. Convert each value individually to base 16. Place each value next to each other in order with no spaces to form a hex code. Underline and identify the R, G, and B values inside.

$$a) 81 = 1010001$$

$$b) 1110111 = 119$$

$$\begin{array}{r} 81 \\ -64 \\ \hline 17 \\ -16 \\ \hline 1 \end{array}$$

128	64	32	16	8	4	2	1	64
								32
								16
								4
								2
								1
								119

$$\begin{array}{r} 16^1 \quad 16^0 \\ A \quad C \\ 10 \times 16 = 160 \\ 12 \times 1 = 12 \\ \hline 172 \end{array}$$

$$10 \times 16 = 160$$

$$12 \times 1 = 12$$

$$172$$

$$\begin{array}{r} 16^1 \\ 9 \quad 9 \end{array}$$

$$9 \times 16 = 144$$

$$9 \times 1 = 9$$

$$\begin{array}{r} 16^1 \\ C \quad 1 \end{array}$$

$$12 \times 16 = 192$$

$$1 \times 1 = 1$$

c)

$$\begin{array}{c} \underline{AC99C1} \\ R \quad G \quad B \end{array}$$

$$\begin{array}{l} R = 172 \\ G = 153 \\ B = 193 \end{array}$$

$$\begin{array}{r} 14 \\ 16 \overline{) 226} \\ \underline{16} \\ 66 \\ 64 \end{array}$$

$$\begin{array}{l} 14 \text{ r of } 2 \quad R = E2 \\ 8 \text{ r of } 15 \quad G = 8F \\ 10 \text{ r of } 13 \quad B = AD \end{array}$$

$$\begin{array}{r} 8 \\ 16 \overline{) 143} \\ \underline{128} \\ 15 \end{array}$$

$$10 = A$$

$$\begin{array}{r} 10 \\ 16 \overline{) 173} \\ \underline{16} \\ 13 \end{array}$$

$$\begin{array}{c} \underline{E28FAD} \\ R \quad G \quad B \end{array}$$

Solve the following problems. If necessary, include code, images, or scanned drawings to support your answer. Submit your solutions as a pdf. Attach Java source files as needed.

Question:	1	2	3	4	5	Total
Points:	100	100	100	100	100	500
Score:						

Week 1 Exercises: Model of a Computer Overview

1. (100 points) How does programming a computer differ from using a computer program?

programming a computer, you tell the computer what the task is and how to operate the task while running a program is using it to complete the task.