Worksheet 10 Solution

March 19, 2020

Question 1

a.

$$\begin{aligned}(165)_8 &= 5 \times 8^0 + 6 \times 8^1 + 1 \times 8^2 && (1)\\ &= 5 + 48 + 64 && (2)\\ &= 117 && (3)\end{aligned}$$

b. **Reference Table**

Number	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G
Value	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

$$\begin{aligned}(B4)_{16} &= 4 \times 16^0 + 11 \times 16^1 && (1)\\ &= 4 + 176 && (2)\\ &= 180 && (3)\end{aligned}$$

Question 2

a.

$$\begin{aligned}
357 \div 2 &= 178, \text{remainder } \mathbf{1} \\
178 \div 2 &= 89, \text{remainder } \mathbf{0} \\
89 \div 2 &= 44, \text{remainder } \mathbf{1} \\
44 \div 2 &= 22, \text{remainder } \mathbf{0} \\
22 \div 2 &= 11, \text{remainder } \mathbf{0} \\
11 \div 2 &= 5, \text{remainder } \mathbf{1} \\
5 \div 2 &= 2, \text{remainder } \mathbf{1} \\
2 \div 2 &= 1, \text{remainder } \mathbf{0} \\
1 \div 2 &= 0, \text{remainder } \mathbf{1}
\end{aligned}$$

Hence, the binary representation of 357 is (101100101).

b.

$$\begin{aligned}
357 \div 8 &= 44, \text{remainder } \mathbf{5} \\
44 \div 8 &= 5, \text{remainder } \mathbf{4} \\
5 \div 8 &= 0, \text{remainder } \mathbf{5}
\end{aligned}$$

Hence, the octal representation of 357 is $(545)_8$

Question 3