

Unit 1 In-Class Assignment 1

August 25, 2025

1. a)

$$309 - 256 = 63$$

$$63 - 32 = 31$$

$$31 - 16 = 15$$

$$15 - 8 = 7$$

$$7 - 4 = 3$$

$$3 - 2 = 1$$

$$1 - 1 = 0$$

Binary	1	0	0	1	1	1	1	1	1
Decimal	256	128	64	32	16	8	4	2	1
Decimal	2^8	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0

b)

$$94 - 64 = 30$$

$$30 - 16 = 14$$

$$14 - 8 = 6$$

$$6 - 4 = 2$$

$$2 - 2 = 0$$

Binary	0	0	1	0	1	1	1	1	0
Decimal	256	128	64	32	16	8	4	2	1
Decimal	2^8	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0

3 c)

$$1 + 2 + 8 + 32 = 43$$

Binary	0	0	0	1	0	1	0	1	1
Decimal	256	128	64	32	16	8	4	2	1
Decimal	2^8	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0

d)

$$1 + 2 + 4 + 8 + 64 = 15 + 64 = 79$$

Binary	0	0	1	0	0	1	1	1	1
Decimal	256	128	64	32	16	8	4	2	1
Decimal	2^8	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0

4 a)

$$\begin{array}{cccccccc}
 1 & 0 & 1 & 0 & 1^1 & 1^1 & 0^1 & 1 \\
 +0 & 1 & 0 & 1 & 0 & 1 & 1 & 1 \\
 \hline
 1 & 1 & 1 & 1 & 1 & 1 & 0 & 0
 \end{array}$$

b)

$$\begin{array}{cccccccc}
 0 & 0^1 & 1 & 1^1 & 0^1 & 1^1 & 0^1 & 1 \\
 +1 & 0 & 1 & 0 & 1 & 1 & 1 & 1 \\
 \hline
 1 & 1 & 0 & 1 & 0 & 1 & 0 & 0
 \end{array}$$

5. a)

$$\begin{array}{cccccccc}
 \chi' & 0+2 & 1 & 1 & 1 & \chi' & 0+2 \\
 - & 1 & 1 & 0 & 0 & 1 & 0 & 1 \\
 \hline
 1 & 1 & 1 & 1 & 1 & 0 & 0 & 1
 \end{array}$$

b)

$$\begin{array}{cccccccc}
 1 & 1 & \chi' & 0+1 & 0+1 & \chi'+2 & 0+2 \\
 - & 1 & 0 & 0 & 1 & 1 & 1 & 1 \\
 \hline
 0 & 0 & 1 & 0 & 0 & 0 & 1 & 1
 \end{array}$$