

CSE 201 Homework 8

1.

- a. $\text{Sum} = 4+X+1+2+2 = 9+X \rightarrow \text{For } 0 \leq X \leq 9: Y = \{1,0,9,8,7,6,5,4,3,2\}$
b. Possible ZIP code extensions: {2233} {4466} {5500}

2.

a.

Card Number	5	5	X	8	3	2	0	1	2	3	4	6	7	8	3
X2, add digits	5	1	X	7	3	4	0	2	2	6	4	3	7	7	3

Sum of all digits = $54+X$. $(54+X) \bmod 10 = 0 \rightarrow X = 6$

- b. Sum of all digits = $52+X \rightarrow X = X = 8$

3.

- a. Routing Number: 2X24Y9663
b. Check sum = $2(3)+X(7)+2(1)+4(3)+Y(7)+9(1)+6(3)+6(7)+3(1) = 92+7(X+Y)$
i. $7(X+Y) = 28 \rightarrow \{X,Y\} = \{1,3\}, \{2,2\}, \{0,4\}$
ii. $7(X+Y) = 98 \rightarrow \{X,Y\} = \{9,5\}$

4. Current ISBN = 87-11-07559-7

- a. Target check sum = $8(10)+7(9)+1(8)+1(7)+0(6)+7(5)+5(4)+5(3)+9(2) = 246$
i. $7(9) + 5(3) = 78 \rightarrow 9x+3y = 78$
 - Let $x = 6 \rightarrow y = 8 \rightarrow \mathbf{86-11-07589-7}$
 - $8(10)+6(9)+1(8)+1(7)+0(6)+7(5)+5(4)+8(3)+9(2) = 246$
 - Let $x = 8 \rightarrow y = 2 \rightarrow \mathbf{88-11-07529-7}$
 - $8(10)+8(9)+1(8)+1(7)+0(6)+7(5)+5(4)+2(3)+9(2) = 246$
ii. $7(9) + 0(6) = 63 \rightarrow 9x+6y = 63$
 - Let $x = 3 \rightarrow y = 6 \rightarrow \mathbf{83-11-67559}$
 - $8(10)+8(9)+1(8)+1(7)+0(6)+7(5)+5(4)+2(3)+9(2) = 246$