CISC 1100 —Structure of Computer Science
Fall, 2016 Dr. X. Zhang

Homework Assignment #1 (Sets)

1 Given the universal set $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$, and sets $A = \{2, 4\}$, $B = \{1, 2, 8\}$, and $C = \{1, 2, 5, 6\}$, calcualte the following:

a. $A \cap C$

b. $A \cup B$

c. B^c

d. $B - C$

e. $C \cap B^c$

f. $|A^c \times B|$

2 Set builder notations:

a. List elements in the following sets given by set builder notations:
$\{x : x \in N \text{ and } x^2 < 64\}$

$\{x \in Z : x^2 < 64\}$

$\{3x : x \in Z \text{ and } x \leq 5\}$

b. Use set build notation to define the set of odd natural numbers.

c. The set of even numbers that are also perfect squares is : $\{x \in N : x = \_ \}$.

3 A furniture store allows the customers to customize desks as follows. When buying a desk, the customer can choose the desk top from a set of options (e.g., map, oak, glass, ...) denoted as set A, choose the type of legs from a set of options denoted as set B (e.g., map, oak, metal,...). Can you write a set expression to represent the set of different desks one can custom make? How many different kinds of desks can be ordered from this store?

4 Draw a Venn Diagram to visualize the following set: $(A \cap C - B) \cup (B - A - C)$

5 Among the 20 students in a class, there are 13 students who have been to California, there are 8 students who have been to Florida, there are 5 students who have been to California and Florida. How many students have not been to California or Florida?