Homework 1, Problem 1: Environment Diagrams with Booleans
In each square, draw an environment diagram as each line of code runs. Put print statements in order on the left side of the code below.

Print Statements:

line 0	a = 1
line 1	b = 2
line 2	c = a * 2
line 3	print(c == b)
line 4	b = b * 2
line 5	print(c == b)
line 6	b = "two"
line 7	print(c == b)
line 8	c == a * 2
line 9	c = c ==b
line 10	c == (a == b)
line 11	c = 10

0	4	8
1	5	9
2	6	10
3	7	11

Homework 1, Problem 2: Logic Practice
You see your instructors at an ice cream store with the following flavors. They tell you their preferences and ask you to order one cone for them. What two scoop combination would satisfy all three? Organize your thoughts using a table like shown below (one example provided), and show at least three combinations you try!

Preferences
Haley: I want anything with chocolate
Annika: I want sorbet OR gelato flavors, but not together
Kei: I want vanilla and one other scoop, but not vanilla alone

Flavors
Sorbet: Strawberry, peach, banana, chocolate chip
Gelato: Vanilla, chocolate, oreo, mango

Flavor 1	Flavor 2	Haley?	Kei?	Annika?
Example: Mango	Example: Mango	Example: FALSE	Example: TRUE	Example: FALSE

Homework 1, Problem 3: Boolean Practice
Goal: Complete the rest of the table below using 1 and 0 to indicate if each boolean is true or false. The first line is completed for you. Pick one more example of variables and work through the solutions yourself – can you find a pair of numbers that make all booleans false?

Boolean 1: True if either variable is larger than 5
Boolean 2: True if either variable is divisible by 5
Boolean 3: True if ONLY one variable is divisible by 5
Boolean 4: True if one variable is divisible by 2, or their sum is divisible by 2, but not both

Variable 1	Variable 2	Bool 1	Bool 2	Bool 3	Bool 4
Example: 5	Example: 1	0 (False)	1 (True)	1	1
1	1				
1	10				
10	10				
3	7				

Homework 1, Problem 4: Logic Challenge 1

You have three jars, one which has oranges, one which has apples, and one which has a mix of both in them. However, all their labels have been swapped! You know that <u>no jar can have its correct label</u>. To relabel them, you can reach in and pull out one fruit at a time. What is the worst case (maximum checks possible) for the number of jars you need to pick from before you can label all three? What is the best (fewest number of checks) you could do?
Try to use an organizer like the one below to work through all possible labels and see what would happen!

Worst case:
Best case:

	real Apple	real Orange	real Mix
label Apple	no	?	?
label Orange	?	no	?
label Mix	?	?	no

Homework 1, Problem 5: Logic Challenge 2
You visit an island where everyone is a knight or a knave: knights can only say true things, and knaves can only say false things. You approach your instructors and they each say one thing:

Haley: At least one thing is true: Kei is a knave or I am a knight.
Annika: Haley could claim that I am a knave.
Kei: Neither Haley nor Annika are knights.

Can you figure out which instructor is a knight and which is a knave? Test by guessing and following the logic! "If [this instructor] is a knight, what does that tell me?"

Knights:
Knaves: