Prior Chapter Review Questions

1. Write a **`for`** loop that will print out a horizontal line of ten asterisks (*).

2. Write two nested **`for`** loops that will print a 10x10 box of asterisks.

3. Write Python code that will **create** an array of 100 zeros.

4. What is the difference between a class and an object?

5. What is the difference between a function and a method?

6. Write a function that prints your favorite number.

7. Call the function that prints your favorite number.

8. Write a function that takes three numbers and returns the average.

9. Programming classes:
    a. Write code for a class called Ball. Give it attributes for its position, and its velocity.
    b. Create a method called update() that will move the ball's position according to its velocity.
    c. Create an instance of Ball, set its attributes.
    d. Create a "for" loop that will call the update() method on ball 10 times, and print the ball's position.

Sorting Chapter Review

10. Write code to swap the values 25 and 40.

```
list = [55, 41, 52, 68, 45, 27, 40, 25, 37, 26]
```

11. Write code to swap the values 2 and 27.

```
list = [27, 32, 18, 2, 11, 57, 14, 38, 19, 91]
```

12. Why does the following code not work?

```
list = [70, 32, 98, 88, 92, 36, 81, 83, 87, 66]
temp = list[0]
list[1] = list[0]
list[0] = temp
```

13. Show how to perform a selection sort on the following numbers:

97 74 8 98 47 62 12 11 0 60

14. Take the following code and fill in the blanks:

```
# The selection sort
def selection_sort(list):

    # Loop through the entire array

    for curPos in range( _____ ):

        # Find the position that has the smallest number
        # Start with the current position

        minPos = _____

        # Scan right
        for scanPos in range(curPos+1, _____ ):

            # Is this position smallest?
            if list[scanPos] < list[minPos]:

                # It is, mark this position as the smallest
                minPos = scanPos

        # Swap the two values

        _____

        _____

        _____
```

15. Show how to perform a insertion sort on the following numbers:

97 74 8 98 47 62 12 11 0 60

16. Take the following code and fill in the blanks:

```
def insertion_sort(list):

    # Start at the second element (pos 1).
    # Use this element to insert into the
    # list.
    for keyPos in range(1, len(list)):

        # Get the value of the element to insert
        keyValue = _____

        # Scan to the left
        scanPos = keyPos - 1

        # Loop each element, moving them up until
        # we reach the position

        while (scanPos >=0) and ( _____ ):
            list[scanPos+1] = list[scanPos]

            _____

        # Everything's been moved out of the way, insert
        # the key into the correct location
        list[scanPos+1] = _____
```

17. Explain what **`minPos`** does in the selection sort.

18. Explain what **`curPos`** does in the selection sort.

19. Explain what **`scanPos`** does in the selection sort.

20. Explain what **`keyPos`** and **`keyValue`** are in the insertion sort.

21. Explain **`scanPos`** in the insertion sort.

22. Modify the sorts to print the number of times the inside loop is run, and the number of times the outside loop is run.