Chapter 5 – Enhancing Classes - AP

Chapter Objectives

- Define reference aliases.
- Explore passing object references as parameters.
- Learn to use the static modifier.
- Using the this reference
- Exception handling

Chapter Overview: This chapter takes a more in depth look at objects and the mechanisms that go into creating a robust system. You should spend ample time decomposing everyday objects into their properties and behaviors and identifying the difference between the two. The ability to classify objects into sub sets of one another is a very important topic here. This chapter has a lot of topics that are covered which are relevant to the AP exam. Static variables and static methods are introduced along with implementations in this chapter. The best way to explain this concept is by seeing examples with code in it. This is an excellent place to see the Case Study code and examples where static variables are used in larger programs.

Multiple Choice: 5.1, 5.2, 5.3, 5.5, 5.6, 5.8, 5.10

True/False: 5.1 – 5.8

Short Answer: 5.1, 5.2, 5.3, 5.7

AP Multiple Choice: 5.1, 5.2, 5.4

Worksheets: Object References

Programming Projects: (none)

Static method: call with class.method (instead of obj.method.)

Purpose: method *doesn't* rely on any instance variables, thus the method would work the same regardless of the object. (i.e. Math.pow)

Static variable: call with class.variable.

Purpose: variable will not change (final) thus it will be the same regardless of the object. (i.e. Math.PI)

Name_________________________

OBJECTS AND OBJECT REFERENCES

1. Given the following declarations:

```
int area;
String name;
```

   a. `area` is a _________________ variable, and `name` is a _________________ variable.

   b. How many objects have been created? _____________

2. Given the following section of code:

```
String strA = "Oh! ";
String strB = new String("No! ");

strA = strB;
System.out.print(strA);
System.out.println(strB);
```

   What is written to the monitor? ____

3. Given the following section of code:

```
String strA = new String("Oh! ");
String strB = "No! ";

strA = strB;
if (strA == strB)
  System.out.println("Two copies of a reference.");
else
  System.out.println("Two different references.");
```

   What is written to the monitor? ____

4. Examine the following section of code:

```
String strA = new String("String ");
String strB = "Cheese ";

strA = strB;
```

   How many objects have been created? After the last statement has executed, how many objects are now accessible (don't count garbage)?

   Created: ___________ Accessible: ___________

5. Examine the following section of code:

```
String strA;
strA = new String("Cheese ");
strA = new String("Theory ");
strA = new String("Bikini");
strA = new String("Ensemble ");
strA = new String("Quartet ");
```

How many objects have been created? After the last statement has executed, how many objects are now accessible (don't count garbage)?

Created: ___________ Accessible: ___________

6. Examine the following section of code:

```
String strA = new String("Cheese ");
String strB = new String("Theory ");
String strC = new String("Bikini");
String strD = new String("Ensemble ");
String strE = new String("Quartet ");
```

How many objects have been created? After the last statement has executed, how many objects are now accessible (don't count garbage)?

Created: ___________ Accessible: ___________

7. Examine the following section of code:

```
String strA = new String("Cheese ");
String strB = strA;
String strC = strA;
String strD = strA;
String strE = strA;
```

How many objects have been created? After the last statement has executed, how many objects are now accessible (don't count garbage)?

Created: ___________ Accessible: ___________

8. An object that has no references to it is called ____________________ .

9. If several reference variables refer to the same object, each variable is said to be an

   ____________________ of the object.

10. To check if two reference variables both refer to the same object, use the _________ operator.

    To check if two different string objects contain equivalent data, use the ________________ method.