Montgomery College, CMSC 203

Static Members Worksheet

Objectives

- Static Members

Concept Question:

1.

Consider the following class declaration:

```
public class Thing
{
     private int x;
     private int y;
     private static int z = 0;

     public Thing()
     {
          x = z;
          y = z;
     }
     static void putThing(int a)
     {
          z = a;
     }
}
```

Assume a program containing the class declaration defines three `Thing` objects with the following statements:

```
Thing one = new Thing();
Thing two = new Thing();
Thing three = new Thing();
```

a. How many separate instances of the `x` member exist?
b. How many separate instances of the `y` member exist?
c. How many separate instances of the `z` member exist?
d. What value will be stored in the `x` and `y` members of each object?
e. Write a statement that will call the `putThing` method.

Answer:

a) 3

b) 3

c) 1

d) 0

e) `Thing.putThing(5);`

2.

a. Describe one thing you cannot do with a static method.

b. Why are static methods useful in creating utility classes?

c. Describe the difference in the way variables and class objects are passed as arguments to a method.

Answer:

a. Access a non-static member.

b. They can be called directly from the class, as needed. They can be used to create utility classes that perform operations on data, but have no need to collect and store data.

c. When a variable is passed as an argument, a copy of the variable's contents is passed. The receiving method does not have access to the variable itself. When an object is passed as an argument, a reference to the object (which is the object's address) is passed. This allows the receiving method to have access to the object.