

KEY \rightarrow 20

Monkey Business – Practice with Arrays of Objects!

Write a MonkeyZoo class. You will use the Monkey class which is provided below for easy access....

Instance variable – an array of Monkey objects called zoo
Static variable – monkeyId starts at 0

Write a **Constructor** for your MonkeyZoo class. Create a random number of objects in your zoo. Give each monkey his own idNum based on monkeyId which you increment before assigning.

Create a method **void feedMonkeys(int numBan)**

For the entire zoo, Check if each monkey is hungry.
If that monkey is hungry, feed him numBan bananas.

Create a method that will find the index of a monkey in the zoo based on number of toys. the method signature is **int findMonkey(int numToys)** simply return the first Monkey object with the right number of toys. if there is no monkey with that number of toys, return -1.

```

public class MonkeyZoo {
    // index of the cage of 1
    private Monkey[] zoo;
    private static int monkeyID = 0;

    public MonkeyZoo ( ) {
        zoo = new Monkey[ (int)(30 * Math.random() + 1)];
        monkeyID++;
        for (int i = 0; i < zoo.length; i++) {
            zoo[i] = new Monkey("Monkey" + monkeyID,
                                monkeyID);
        }
    }
}

```

* * other methods on back page * *

```

/**
 * The Monkey class is an instructional tool for learning.
 * about objects and classes.
 * @author (Julie Goode)
 * @version (1.01 Sept2014)
 */
public class Monkey
{
    /** instance variables - these are private ENCAPSULATION
    //the instance variables can be referred to anywhere within this class,
    //but not outside of it. From another class the instance variables can
    //only be accessed or changed via the public methods!! */
    private String mName;
    private int mID;
    private String message;
    private int numToys;
    private boolean isHungry;
    private int numBananas;
    private Monkey bestFriend;

    /** Constructor for objects of class Monkey */
    public Monkey(String name, int id)
    {
        /** initialise instance variables, those that are not
        * instantiated will be defaulted by the JVM;
        * int gets 0, String gets null, boolean gets false */
        mName=name;
        isHungry=true; //monkeys are always hungry!!
        mID = id;
    }

    /** document comment
    * @param msg holds a string variable
    * @return none because void or mutator method
    */
    public void setMessage(String msg)
    {
        message = msg;
        //note: if I put msg=msg; then the instance variable is never set
        //msg which is a local variable is set to itself. nothing happens!!
    }

    /**
    * @param none we are making the monkey speak
    * @return none because void or mutator method
    */
    public void speak() {
        System.out.println(message);
    }
}

```

```

/**
 * @param n integer number of toys to give monkey to play with
 * @return none because void or mutator method
 */
public void addToys(int n) {
    numToys += n;
}

/**
 * @param none we are asking the monkey if it is hungry
 * @return boolean return true if our monkey is hungry
 */
public boolean isHungry() {
    if (numBananas > 3)
        isHungry = false;
    else
        isHungry = true;

    return isHungry;
}

/**
 * @param n integer number of bananas to give monkey to eat
 * @return none because void or mutator method, alters
numBananas
 */

public void eatBananas(int n){
    // note: total is a local variable. only accessed in this method!
    int total = n + numBananas;
    numBananas = total;
}

public String getMsg() {
    return message;
}

public String getName() {
    return mName;
}

/**
 * @param none we are asking the monkey how many toys it has
 * @return boolean return true if our monkey is hungry
 */
public int howManyToys() {
    return numToys;
}

```

/** Note - it is convention that places the constructors at the front of the class. The code compiles even if this is at the end of the code...

```
*/  
public Monkey(int numT, String mName) {  
    this(mName);  
    //isHungry = true;  
    numToys = numT;  
    message = "ooh ooh ooh ooh ooh!";  
}  
  
@Override  
public String toString() {  
    return ("Monkey: "+getName()+"\nHungry? "+isHungry()+"\nHas  
how many toys: "+  
    howManyToys()+"\nMessage: "+getMsg()+"\n");  
}  
}
```

```
public void feedMonkey (int numBan) {  
    for (Monkey m : zoo) {  
        if (m.isHungry())  
            m.eat Bananas (numBan);  
    }  
}  
  
public int findMonkey (int numToys) {  
    for (int i = 0; i < zoo.length; i++) {  
        if (zoo[i].howManyToys == numToys)  
            return i;  
    }  
    return -1;  
}
```