

1. Vocabulary Terms – Matching [5 pts]

1. _____ Iteration
2. _____ Method
3. _____ Array
4. _____ Class
5. _____ Accessor

- A.** The term that describes the delayed evaluation of a functions arguments in a functional language, as opposed to the immediate evaluation found in an OO language.
- B.** A blueprint for a data type, from which Objects can be made.
- C.** An anonymous function, most similar to lambda from scheme.
- D.** A method that is used to change the value of a local variable.
- E.** A paradigm of OO programming in which Objects are grouped together based on similarities in their structure.
- F.** A block of code which has a name, and may be called similarly to functions.
- G.** A method that is used to obtain the value of a local variable.
- H.** Using a loop to perform similar operations multiple times.
- I.** A static data structure that can hold multiple elements of the same type.
- J.** A method that is used to obtain the value of an instance variable.
- K.** The term that describes the delayed evaluation of a functions arguments in an OO language, as opposed to the immediate evaluation found in a functional language.

2. Short Coding [10 pts]

- 5 (a) Write the method **public int sum(int x)** which returns the sum of all of the integers from 1 to **x** (inclusive). For example, $\text{sum}(5)=1+2+3+4+5=15$. For this method, you **MUST use recursion ONLY**. If you do not use recursion, or you use any iteration, you will receive no credit for this problem.
- 5 (b) Write the method **public int factorial(int x)** which returns **x** factorial. Remember that the factorial of **x** is the product of all numbers from 1 to **x** (inclusive). Also, remember that 0 factorial is 1. For this method, you **MUST use iteration ONLY**. If you do not use iteration, or you use any recursion, you will receive no credit for this problem.

3. Arrays – Short Coding [15 points]

- 7 (a) Write the method `public int sum(int[] data)` which computes the sum of the items found in `data`. You may assume that `data` is not null.
- 3 (b) Create a variable `myArray` to be a 3 dimensional array of doubles. Initialize `myArray` to be a 1 by 3 by 5 array of doubles.
- 5 (c) With `myArray` as above, what is the type of `myArray[0]`?

4. Datatype and Casting – Short Answer [20 points]

For each of the following, determine if the given code fragment is legal syntactically (you do not need to try to figure out if it does what the programmer meant). If the code fragment is legal, write **OK**, otherwise write **ERROR** and rewrite the code fragment correctly. You may **NOT** change the declared types of any variables when you rewrite the code, instead you must apply proper casting.

- 1 (a) `int y = 2.8;`
- 1 (b) `float f = 2;`
- 2 (c) `long wayFromHome= 67;`
`int z=wayFromHome;`
- 3 (d) `char broiled = 'b';`
`int ernal = broiled;`
- 3 (e) `long game = 12345;`
`short patience = (short) game;`
`int z = shot;`
- 5 (f) Write the method **public double quadratic(double x, int a, int b, int c)** that computes $a * x^2 + b * x + c$ and returns that value (as on **P0**). You should only cast WHERE NEEDED. Do not make any unneeded casts.
- 5 (g) Explain why each of the casts that you made were needed above, or if you did not cast anywhere, explain why no casts were needed.

5. Simple Objects – Short Coding [15 pts]

Given the following incomplete class:

```
public class Person
{
    private int age;
    //YOUR CODE WOULD GO HERE
} //end class person
```

- 5 (a) Write a modifier method for the variable age.
- 5 (b) Write an accessor method for the variable age.
- 5 (c) Declare a variable **myPerson** of type **Person**, and initialize it to a new instance of **Person**, then use the appropriate method to set **myPerson**'s age to be 37.

6. Basic Commands – Short Answer [15 points]

- 5 (a) What command do you type at the command prompt to run the java class **MyProgram**?
- 5 (b) What command do you type at the command prompt to compile all of the java files in the current directory?
- 5 (c) What command do you type at the command prompt to generate html documentation files from the comments in your program for all java files in the current directory?

7. Simple Tracing – Tracing [10 pts]

Given the following code:

```
public class Tracing2 {
    int myNumber;
    public Tracing2(int n) {
        setMyNumber(n);
        System.out.println("Created Tracing2 with "+getMyNumber());
    }
    public int getMyNumber() {
        return myNumber;
    }

    public void setMyNumber(int v) {
        this.myNumber = v;
    }
    public String toString(){
        return "A Tracing2 with "+ getMyNumber();
    }
    public static void main(String[] args) {
        Tracing2 a=new Tracing2(1);
        Tracing2 b=new Tracing2(-2);
        Tracing2 c=new Tracing2(4);
        Tracing2[] myArray=new Tracing2[3];
        myArray[0]=c;
        myArray[1]=a;
        myArray[2]=b;
        System.out.println("printing the array");
        for(int i=0;i<myArray.length;i++)
            {
                System.out.println(myArray[i]);
            }
        System.out.println("what now?");
        a.setMyNumber(b.getMyNumber());
        b.setMyNumber(a.getMyNumber());
        System.out.println(a);
        System.out.println(b);
    } //end method main
} //end class Tracing2
```

Write the output when the above class is run below:

8. Switch/case versus if/else – Short Coding [10 pts]

Given the following code fragment:

```
switch(x)
{
    case 4:
    case 5:
        System.out.println("what?");
    case 1:
        System.out.println("frog");
        break;
    case 0:
        System.out.println("linux");
        break;
    default:
        System.out.println("foiled again");
}
```

Write equivalent code that uses if-else instead of switch-case