CS 1322 Test 1 δ Wednesday, September 11th, 2002

Name: _____

GT Number: _____

TA: _____

Commenting your code on this test is optional, however it may help the grader understand your code better. Other style issues such as using good variables names and using abstraction are still required. Write your gt number in the spaces provided and color in the corresponding numbers and letters.

gt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	d	e	f	g	h	0	1	2	3	4	5	6	7	8	9	-	-	-	-	-	-	-	-	-	-	-
	0	1	2	3	4	5	6	7	8	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0	1	2	3	4	5	6	7	8	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0	1	2	3	4	5	6	7	8	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z

Problem	Points Possible	Points Received	Graded By
1 Matching Terms	5		
2 Basic Coding	10		
3 Array Coding	15		
4 Datatypes	20		
5 Basic Objects	15		
6 Java Commands	15		
7 Tracing	10		
8 Switch vs if	10		
TOTAL	100		

Please remember: Any academic misconduct (including, but not limited to, the list below) could result in a 0 (zero) on the exam and/or an F grade in the course:

- Communication with anyone other than a proctor for ANY reason in ANY language in any manner.
- Sharing of ANYTHING (e.g. pencils, paper, erasers).
- Writing on paper that is not given to you by a proctor.
- Failure to follow directions given by the proctor.
- Failure to stop writing when the allowed time is up (as reported by the proctor).
- Use of cell phones, beepers, handheld computers, calculators, during the exam.
- Using books or other reference material.
- Disruption of the exam setting.

By taking this exam, you signify that it is your work and that you have neither given nor received inappropriate help during the taking of this exam in compliance with the Academic Honor Code of Georgia Tech.

Signature: _____

(you must sign this for your exam to be graded!)

1. Vocabulary Terms – Matching [5 pts]

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

A. An anonymous function, most similar to lambda from scheme.

B. 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.

C. A method that is used to change the value of a local variable.

D. A paradigm of OO programming in which Objects are grouped together based on similarities in their structure.

E. A method that is used to obtain the value of a local variable.

F. A block of code which has a name, and may be called similarly to functions.

G. A blueprint for a data type, from which Objects can be made.

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. 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.

K. A method that is used to obtain the value of an instance variable.

2. Short Coding [10 pts]

5 (a) Write the method **int multiply(int x, int y)** which returns **x * y**, without use of the * operator. Remember that multiplication can be expressed as repeated addition. For this method, you **MUST use recursion ONLY**. If you do not use recursion, if you use any iteration, or if you use the * operator you will receive no credit for this problem.

5 (b) Write the method **int arithTerm(int a, int d, int t)** which returns the $\mathbf{t}^{th}$ term of the arithmatic series with initial term **a** and difference **d**. Remember that the first term of an arithmatic series is **a** and that subsequent terms are obtained by adding **d** to the previous term. For example, the arithmatic sequence with a=1 and d=2 goes 1,3,5,7,... so arithTerm(1,2,4) would equal 7. 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 min(double[] int)** which computes the maximum of the items found in **data**. You may assume that there is at least one element in **data**.

[3] (b) Create a variable **myArray** to be a 3 dimensional array of longs. Initialize **myArray** to be a 8 by 5 by 7 array of ints.

[5] (c) With **myArray** as above, what is the type of **myArray[4]**?

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 x = 6.99;

[1] (b) double d = 234;

[2] (c) int aNumber = 341;
double someDouble=aNumber;

[3] (d) long shot = 123456;
short trip = (short) shot;
int x = shot;

[3] (e) char c = 'z';
int z = c;

[5] (f) Write the method **public double quadractic(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 where needed.

5. Simple Objects – Short Coding [15 pts]

Given the following incomplete class:

```
public class Car
{
    private String model;
    //YOUR CODE WOULD GO HERE
}//end class Car
```

5 (a) Write a modifier method for the variable model.

5 (b) Write an accessor method for the variable model.

5 (c) Declare a variable **myCar** of type **Car**, and initialize it to a new instance of **Car**, then use the appropriate method to set **myCar**'s model to be "Ford".

6. Basic Commands – Short Answer [15 points]

5 (a) 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?

5 (b) What command do you type at the command prompt to run the java class **MyProgram**?

5 (c) What command do you type at the command prompt to compile all of the java files in the current directory?

7. Simple Tracing – Tracing [10 pts]

Given the following code:

```
public class Tracing4 {
  int myNumber;
  public Tracing4(int n) {
    setMyNumber(n);
    System.out.println("Made with "+getMyNumber());
  }
  public int getMyNumber() {
    return myNumber;
  }

  public void setMyNumber(int  v) {
    this.myNumber = v;
  }
  public String toString(){
    return  getMyNumber() + " is my number";
  }
  public static void main(String[] args) {
    Tracing4 a=new Tracing4(11);
    Tracing4 b=new Tracing4(-3);
    Tracing4 c=new Tracing4(77);
    Tracing4[] myArray=new Tracing4[3];
    myArray[0]=c;
    myArray[1]=b;
    myArray[2]=a;
    System.out.println("printing");
    for(int i=0;i<myArray.length;i++)
      {
        System.out.println(myArray[i]);
      }
    System.out.println("something different");
    b.setMyNumber(c.getMyNumber());
    c.setMyNumber(a.getMyNumber());
    System.out.println(c);
    System.out.println(b);
  }//end method main
}//end class Tracing4
```

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:

```
if(a==7)
  {
      z=1;
  }
else if(a==12)
  {
     z=9;
  }
else if(a=21 || a==900)
  {
      z=3;
  }
else
  {
      z=2;
  }
```

Write equivalent code that uses switch-case instead of if-else. Use the "Fallthrough" technique where appropriate.