fName_____

Test 1

(250pts)

A. Tracing Code (60pts)

Write what output will appear in the box provided. If there is screen output and file output, be sure to place output for each in their correct boxes. Also, make sure you keep track of your variable states as you trace through the code. There are boxes provided for these also, please us them. It will be best to cross out old values as you update them rather than delete them as this will help you maintain a version history in case you need to retrace your steps.

1. (5pts)

```
System.out.print("The\f ");
System.out.print("Gree\n\\n");
System.out.println("\t\tgrass");
System.out.print("grue");
```

output

2. (5pts) The user enters 5 for the first input 50 for the second input.

```
Scanner s = new Scanner(System.in);

int a = s.nextInt();
String throw_away = s.nextLine();  //if you don't know why this line is here ignore it
int b = s.nextInt();

System.out.println(a + b);
String n = Integer.toString(b);
System.out.println(n + a);
System.out.println(n + b);
```

output

3. (5pts)

```
int a = 10;
int b = 20;
int c = 30;

if(a > b){
        if(a > c){
                System.out.println(a);
                if(b > c){
                        System.out.println(b);
                        Sytem.out.println(c);
                } else{
                        System.out.println(c);
                        System.out.println(b);
                }
        } else{
                System.out.println(c);
                System.out.println(a);
                System.out.println(b);
        }
} else{
        if(b > c){
                System.out.println(b);
                if(a > c){
                        System.out.println(a);
                        System.out.println(c);
                } else {
                        System.out.println(c);
                        System.out.println(a);
                }
        } else{
                System.out.println(c);
                System.out.println(b);
                System.out.println(a);
        }
}
```

output

4. (5pts)

```
int  a = 19870;
int q  = a / 10;
int r = a % 10;

System.out.println(q);
System.out.println(r);
```

output

5. (5pts)

```
String integer = “int”;
int string = 1920189147;
char s =  83; //ASCII number for the letter ‘S’

System.out.println(s + integer + string);
```

output

6. (5pts)

```
boolean yes = false;

if(yes && yes == !true){
        System.out.print(“no”);
} else {
        System.out.print(“yes”);
}
```

7. (5pts)

```
for(int i = 0; i < 3; i++){
        for(in j = 0; j < 2; j++){
                System.out.print(“j”);
        }
        System.out.print(“\n”);
}
```

i

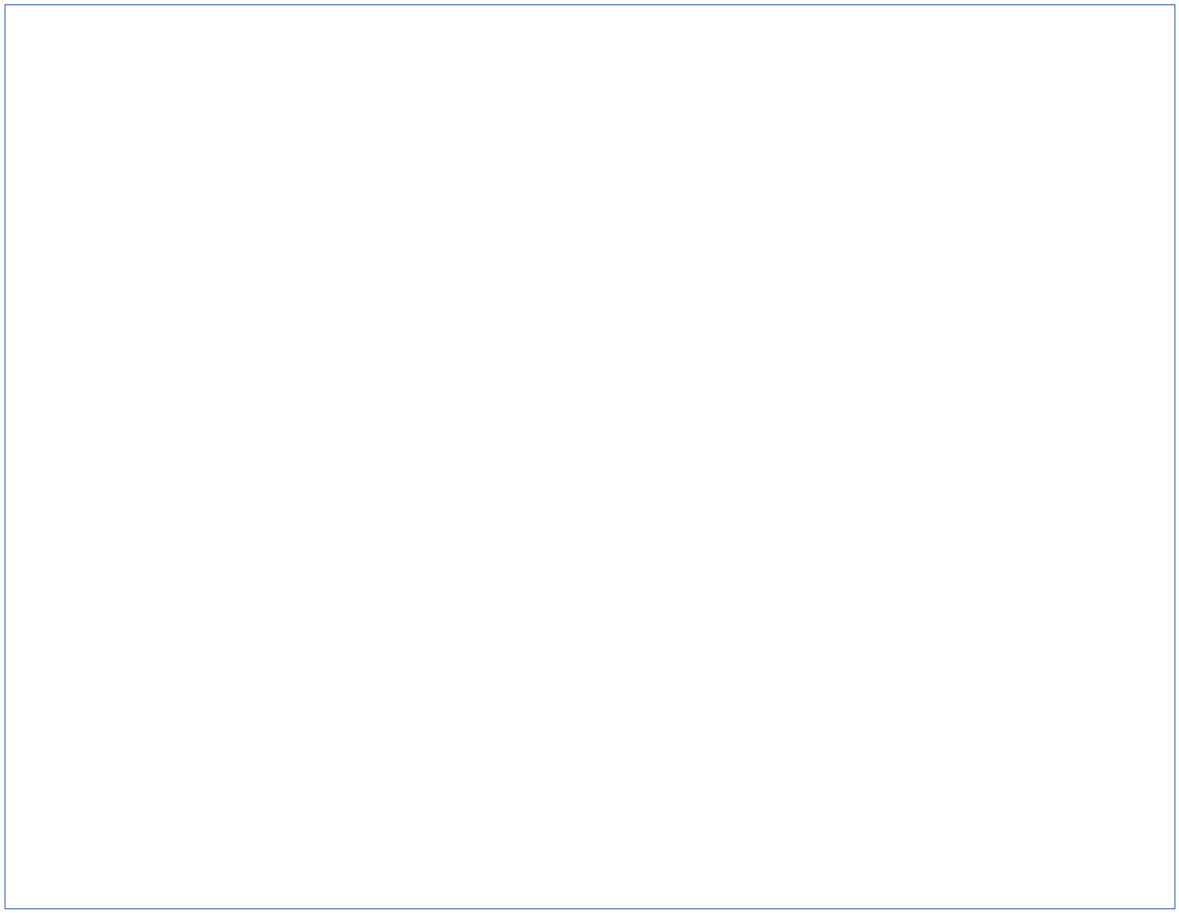
i

output

8. (5pts)

```
import java.util.Scanner;
import java.io.File;
import java.io.IOException;

public class Homoiconic {
	public static void main(String [] args) throws IOException{
		Scanner fileIn = new Scanner(new File("Homoiconic.java"));

		while(fileIn.hasNext()){
			System.out.println(fileIn.nextLine());
		}
	}
}
```

output



9. ***Challenge Bonus (10pts)**

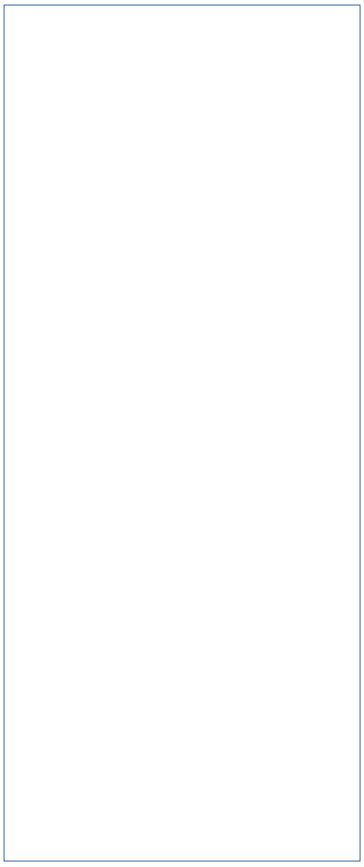
```
String str = "murder";
 char left, right;

 for(int i = 0; i < str.length() / 2; i++){
  left = str.charAt(i);
  right = str.charAt(str.length() - 1 - i);

  str = str.substring(0, i)
          + right
          + str.substring(i + 1);

  str = str.substring(0, str.length() - 1 - i)
       + left
       + str.substring(str.length() - i);
 }

 System.out.println(str);
```

output

left

right

str



10 ***Challenge Bonus (10pts)**

```
int number = -17490;

while (number % 10 == 0){
  number /= 10;
}


int length = (int) (Math.log10(Math.abs(number)) + 1);
int current = number;
int q, r;
int answer = 0;

for(int i = length; i > 0; i--){
  q = current / 10;
  r = current % 10;

  answer += r * Math.pow(10, i - 1);

  current = q;

}

System.out.println(answer);
```

number length q r

answer

I current

B. Debugging Code (28pts)

1. (4pts)

```
int x = 61;

if(x > 5 && < 100){
        System.out(“good”);
}
```

2. (4pts)

```
        char a, b, c;

        c = “Hello world!”

        System.out.println(c);
```

3. (4pts)

```
        if(x = 22){
                System.out.println(‘22 years old finally’);
        } else{
                System.out.prinln(“Forever 21”);
        }
```

4. (4pts)

```
        for(i = 0 i < 10 i++){
                System.out.println(“We are the champions!”);
        }
```

5. (4pts)

int x = “A man has 2 lives”;
int x = The second life begins after he realizes he only has one”;

System.out,println(x);

6. (4pts)

String a = “If you want to go fast go alone. ”;

b = “If you want to go far, go together”;

System.out.println(a – b);

7. (4pts)

double a = “The best time to plant a tree is 20 years ago”;
double b = “The second best time is now.”;

```
for (int i = 20; i > 0; i--){
        System.out.println(a);
        if(i == 1){
                System.out.println(b);
        }
}
```

8. (4pts)

Sytsem.out.prtnln(“The absence of proof is not proof of absence”);

Concepts (56pts)

1. What is the difference between a .class file and a .java file?

2. What are packages and how are they related to import statements?

3. What is System.out?

4. What is Scanner?

5. What is the syntax of a computer program?

6. What is the difference between a computer program and an algorithm?

7. If we gave every computer the same amount of memory and were not worried about how long it took to accomplish a task, could all computers perform any calculation that any other computer could, why or why not?

8. What is the main function for?

9. Why do we put semicolins at the end of most lines?

10. In the statement “int x;” which word is a keyword and which word is a user-defined identifier? What is the difference between the two?

11. When would you choose to use a while loop over a for loop?

12. What is the difference between double and float?

13. What is an IDE such as NetBeans for? What would you have to do to write computer programs without using NetBeans/Eclipse/Intellij/etc?

14. What made you interested in programming?

Writing Programs (120pts)

1. (10pts) Write a program that stores two numbers each in their own variable. Print each number to the screen. Next swap the numbers so that the first variable has the number from the second variable and the second variable has the number from the first variable. Print them to the screen again after the swap.

2. (10pts) Write a program that takes two numbers from a user and prints out a number of asterisks equal to whichever number input by the user was the smallest.

3. (10pts) Write a program that prints out the numbers from 1 to 4096.

4. (10pts)Write a program that prints the file named jokes.json to the screen.

5. (10pts)Write a program that prints out a random number between 0 and 1 [0,1) where 1 is non-inclusive.

6. (10pts) Write a program that asks for an even number. The program will say thank you if the number is even, but if it is not, the program threatens to throw chairs at the user.

7. (10pts) Write a program that prints out the following structure using a nested for loop:

v
vv
vvv
vvvv

8. (10pts) Write a program that asks the user what the meaning of life is over and over again until they type the number 42.

9. (10pts) Write a program that asks a user for a number and then prints out the corresponding ASCII character for that number.

10. (10pts) Write a program that takes input from the user, converts all of the letters to lowercase, and removes any whitespace from the edges.

11. ***Challenge Bonus (20pts)** Write a program that takes 3 numbers from a user and prints the numbers out in order from greatest to least.

Assignment (54pts)

Write a program that asks a user for integers over and over again until they type in the word ‘done’. Convert the even numbers into ASCII characters, build a String out of the converted numbers, and print that String to the screen. For instance, if a user enters 66 as the first input and then 69, 70, and 70 for the next 3 inputs. The program would convert 66 to the letter B and add it to the final String, it would discard 69, and then it would convert each of the 70’s to a letter F and add each of those to the end of the String. It would then print out: BFF and the program would end.

Make sure your program takes numbers to be converted to letters from the user until they type done. When the user types ‘done’ make sure you can account for the user typing in mixed case and various amounts of whitespace. Things like:

‘DONE’ ‘Done’ ‘ done ‘ and ‘ DOne’

should work just fine in your program (the single quotes are there to show you whitespace in the input).