

Fall, 2013 CIT 590

Programming Languages and Techniques

Final - 2 hrs

Make sure to write down any assumptions you make. Please feel free to use the back of the answer booklet to continue (or begin) solutions. Always put down a question number for it.

Write your name and your email on this first page.

There are 15 questions in total.

Questions.

1. You are given the following code that represents Complex numbers.

```
class Complex{
    Double realPart;
    Double imaginaryPart;

    public Complex(Double realPart, Double imaginaryPart){
        this.realPart = realPart;
        this.complexPart = imaginaryPart;
    }

    public add(Complex c){
        this.realPart += c.realPart;
        this.imaginaryPart += c.imaginaryPart;
    }
}
```

Write the equals method for this class.

(2 pts)

2. How does one pause the execution of a program for 5 seconds. Write a single line of code for this. (1 pt)

3. Sketch out what the UI will look like after the running of the following code. This does not need to look perfect, but the relative arrangements do matter. (3 pts)

```
frame = new JFrame("frame this!");
frame.setLayout(new FlowLayout());
panel1 = new JPanel();
panel1.setLayout(new BorderLayout());
button1 = new JButton("first");
button2 = new JButton("second");
panel2 = new JPanel();
panel2.setLayout(new GridLayout(1,3));
button3 = new JButton("1");
button4 = new JButton("3");
button5 = new JButton("2");

panel1.add(button1, BorderLayout.NORTH);
panel1.add(button2, BorderLayout.EAST);
panel2.add(button3);
panel2.add(button4);
panel2.add(button5);

frame.add(panel1);
frame.add(panel2);

frame.pack();
frame.setSize(1024,768);
frame.setVisible(true);
```

4. If a class extends Observable, what are the two lines of code needed in order to inform the Observer that something has happened and it needs to run its update method? (1 pt)

5. Who was your best partner this semester? If you do not remember the name, please name the assignment (we do not need a number, just the description like Calculator will be fine). (1 pt)

6. Who was your worst partner this semester? Same instructions as above if you do not remember the name. Also, these are 2 free points, so do not leave this blank! (1 pt)

7. Find the bugs in the following programs. A bug is something that Eclipse will point out with a red squiggly or something that has unintentional consequences. Please explain what the bug is (a word/short sentence is sufficient) and then write out the fix. Some of the fixes are a small change while some would require potentially writing more code. (7 pts)

```
public static void main(String [] args) {  
    FileReader fileReader = new FileReader("finalExam.txt");  
}
```

```
int x = 45;  
int y = 5;  
if ( x = 2) & (y = 5){  
    System.out.println("x is two and y is five");  
}
```

```
public class DoSomething implements Runnable {  
  
    public void start() {  
        for (int i = 0; i < 10; i++) {  
            System.out.println("i am here");  
        }  
    }  
}
```

```
public static void main(String[] args) {  
    ArrayList<String> myList = new ArrayList<String>();  
  
    myList.add("ar");  
    myList.add("bh");  
    myList.add("us");  
    myList.add("nu");  
    myList.add("rm");  
  
    Iterator<String> it = myList.iterator();  
    while (it.hasNext()) {  
        String value = it.next();  
        if (value.equals("bh"))  
            myList.remove(value);  
    }  
}
```

9. Why are abstract classes useful? Can everything that we do with interfaces be done by declaring abstract classes instead? Give us an example of an inbuilt abstract class in Java and an inbuilt interface in Java. (4 pts)
10. When saving a java project as an executable, what file format is this executable stored as? (1 pt)
11. What is the output of the following code? Show your working to get partial credit. (4 pts)

```
public static void main(String [] args) {
    int n1 = 2435;
    int n2 = 0;
    int temp = 0;
    while(n1 > 0){
        temp = ++n1%10;
        n2 = n2++ * 10 + temp;
        n1 = n1/10;
    }
    System.out.println(n1 + n2 + " Crazy number is " + n1 + n1);
}
```

12. True or False (10 pts)

- For a string variable `s`, the comparison `(s == null)` and `(s == "")` are effectively doing the same thing.
- `Integer.parseInt("5")` is an example usage of a static method.
- `int x = 5;` and `Integer x = 5;` mean the same thing.
- Every class has to have a parameter less constructor.
- A class can implement multiple interfaces.
- Every class has to have a name.
- The regular expression `'[a-z]+[0-9]*?\\slanding'` will match the string `'apollo11 landing'`.
- When using MVC, the model should depend on the view.
- In pair programming it is best to code silently.
- A variable in a final class cannot be modified.

