

# SE1011: Exam 1 Name:

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This is a closed-book, closed-computer, etc. exam. You may use one 8.5"x11" sheet of notes, which you will turn in with your exam. Review all questions before you get started. Use the page at the end of the exam for extra work. Write your name on the front of each page. The exam is printed double-sided. Show all work.

1. (10 points)
  - a. Is it legal to explicitly cast from a double to an int (as below)? **Write** yes or no, **and explain** your answer.  

```
double d = 5.0;
int i = (double)d;
```
  - b. Is it legal to implicitly cast from a long to a float (as below)? **Write** yes or no, **and explain** your answer.  

```
long l = 4L;
float f = l;
```
2. (10 pts.) Consider the expression  $!(x > 0 \ || \ 10 \leq x)$ . Simplify this expression using DeMorgan's laws so that the "!" does not wrap the result of the boolean operator. Simplify the negated comparisons as well. **Write** your simplified expression and **draw** a box around your final answer. (Show work for partial credit.)
3. (5 pts.) **Write** what will be displayed if the following line is run. **Draw** a box around your final answer.

```
System.out.println(2 + 4 % 3 );
```

4. (10 pts.)

- a. **Describe** the contents of a .java file (that is, a file with its filename ending with the extension “.java”).
  
  
  
  
  
  
  
  
  
  
- b. Which program reads the .java file: the compiler or the Java virtual machine? **Write one of these.**
  
  
  
  
  
  
  
  
  
  
- c. **Write** what this program does with the .java file.

5. (5 pts.) Consider the following program:

```
public static void main(String[] args) {  
    Scanner in = new Scanner(System.in);  
    System.out.println("Please _enter _a _word.");  
    String word = in.next();  
    System.out.println("Letters:_" + word.charAt(1) +  
        "_and_" + word.charAt(3));  
}
```

**Write** what will be displayed if Exam is entered by the user. (Use \_ in the place of a space.)

6. (20 pts.) [Console input/output (IO)] Complete the following program so that it does the following: **Ask** the user to enter a number. **Accept** an integer from the user. **Print** (to the console) "going\_up" the number of times the user specifies. Use `System.out.println(...)`; to print to the console. For example, if the user enters 2, you should print
- ```
going up
going up
```

```
import java.util.Scanner;
public class Exam {
    public static void main(String[] ignored) {
        Scanner in = new Scanner(System.in);
```

```
    }
}
```

You may use this space for flowchart, pseudocode, example input output, etc.

7. (25 points) Consider writing a program that does the following: Allow a user to enter salaries, and compute the 10% flat tax for each salary, until the user specifies that they are done computing taxes. In particular, the program should ask the user for a salary, and then ask the user if they are done at each step. You do not need to print prompts for the user input. You can assume these are implied when you input a variable.

a. **Fill in** each of Dr. Hasker's steps for completing a while loop for this program:

1. Exit:

2. Continue:

3. Minimal step:

4. Initialization:

5. Cleanup:

b. **Write** the low-level pseudocode (or Java code that does not need perfect syntax) for this program. Your pseudocode/Java-code should include the proper loop structure, indentation, input statements, variable assignments, and print statements in the correct places.

8. (15 pts.) **Complete** the following program to display the message “Good week” if the number of pizzas the user consumed are between 0.5 and 2.5. If the number of pizzas is outside this range, display the message “Bad week”. Consider the cases where the number of pizzas eaten is exactly 0.5 or 2.5 as a “Good week”. Use `JOptionPane.showMessageDialog(null, ...)` for the output instead of printing to the console. Use `Double.parseDouble(...)` to convert from a `String` to a `double`.

```
import javax.swing.JOptionPane;

class Exam {
    public static void main(String[] ignored) {
        String numPizzasString = JOptionPane.showInputDialog(null,
            "How many pizzas were eaten this week?");

    }
}
```

You may use this space for extra work. Indicate the problem you are working on.