Exam 1

You started this quiz near when it was due, so you won't have the full amount of time to take the quiz.

⚠ This is a preview of the published version of the quiz

Started: Feb 26 at 3:16pm

Quiz Instructions

This exam must be completed during the class period on Wednesday, March 11, 2015. You may **not** use any additional resources to complete this exam. You may not use a compiler, you may not use the Internet beyond what is required to access the exam on canvas, you may not use any books or notes, and you may not discuss any part of your answers with anyone else.

Question 1 0 pts

By typing your name in the box below you confirm that you have adhered to the academic honesty policies of the University and this course. You confirm that you have not used a compiler or IDE in the completion of this exam. You confirm that you have not used the Internet to access any web page other than this specific exam web page. You confirm that you have not discussed your answers with anyone other than the professor of the course. You may not search for any information on the web and you may not access any course web pages in the completion of this exam. You understand that if you are found in violation of any of the policies above you may be given an automatic F in the course. Completion of this question is required in order to pass this exam.

Question 2 5 pts

Which of the following two programs will result in an error?

Program 1:

```
public class StaticOne {
        private int number;

        public static void main(String[] args) {
                this.number = 5;
        }
}
```

Program 2:

```
public class StaticTwo {
        private static int number;

        public void setNumber() {
                this.number = 1;
        }

        public static void main(String[] args) {
                (new StaticTwo()).setNumber();
        }
}
```

- ○ Program 1
- ○ Program 2

Question 3 5 pts

Explain your answer for Question 1 - Static. If you chose Program 1, why will the program generate an error? If you chose Program 2, why will the program generate an error?

Question 4

10 pts

The following program has several problems with coding ***style***. Identify at least **five**. Make sure to *explain* each problem you specify. You will get one point for identifying the problem and one point for your explanation, up to a maximum for 10 points for five problems.

```
public class fraction {
        int Numerator;
        int Denominator;
        double value;

        fraction(int Numerator, int denom) {
                this.Numerator = Numerator;
                this.Denominator = denom;
        }

        public Double GetValue() {
                value = ((double)Numerator)/Denominator;
                return value;
        }
}
```

Question 5

5 pts

What is the output of the following code fragment? This may be a trick question, so be sure to explain your answer. You may assume this code is in a valid class/method with appropriate imports, etc. In other words, *compiler error because there is no main method* is not the answer I am looking for.

```
ArrayList<String> list = new ArrayList<>();
list.add("apple");
list.add("zebra");
list.add("chocolate");
for(String s: list) {
        System.out.println(s);
}
```

Question 6

5 pts

What is the output of the following code fragment? This may be a trick question, so be sure to explain your answer. You may assume this code is in a valid class/method with appropriate imports, etc. In other words, *compiler error because there is no main method* is not the answer I am looking for.

```
Set<String> set = new TreeSet<>();
set.add("apple");
set.add("zebra");
set.add("chocolate");
for(String s: set) {
        System.out.println(s);
}
```

Question 7

5 pts

What is the output of the following code fragment? This may be a trick question, so be sure to explain your answer. You may assume this code is in a valid class/method with appropriate imports, etc. In other words, *compiler error because there is no main method* is not the answer I am looking for.

```
HashMap<String, Boolean> map = new HashMap<>();
map.put("apple", true);
map.put("zebra", false);
map.put("chocolate", true);
for(String s: map.keySet()) {
        System.out.println(s);
}
```

Question 8

5 pts

What is the output of the following code fragment? This may be a trick question, so be sure to explain your answer. You may assume this code is in a valid class/method with appropriate imports, etc. In other words, *compiler error because there is no main method* is not the answer I am looking for.

```
HashMap<String, Boolean> map = new HashMap<>();
map.put("apple", true);
map.put("zebra", false);
map.put("chocolate", true);
for(String s: map.keySet()) {
        System.out.println(map.get(s));
}
```

Question 9

5 pts

What is the output of the following code fragment? This may be a trick question, so be sure to explain your answer. You may assume this code is in a valid class/method with appropriate imports, etc. In other words, *compiler error because there is no main method* is not the answer I am looking for.

```
TreeMap<String, Boolean> map = new TreeMap<>();
map.put("apple", true);
```

```
map.put("zebra", false);
map.put("chocolate", true);
for(String s: map.keySet()) {
        System.out.println(map.get(s));
}
```

Question 10

5 pts

Rewrite the following code such that it does *not* use a try-catch to handle the exception. Instead, make sure the NullPointerException is never thrown, whether i is null or not.

```
try {
        System.out.println(i.toString());
} catch(NullPointerException npe) {
        System.out.println("i is null.");
}
```

Question 11

5 pts

Which of the following are *checked* exceptions.

- [ ] FileNotFoundException
- [ ] ArithmeticException
- [ ] ArrayIndexOutOfBoundsException
- [ ] IOException

Question 12

5 pts

Consider the following code and assume the methods are in the same class.

```
public synchronized void methodOne() {
        System.out.println("start method one");
        System.out.println("end method one");
}

public void methodTwo() {
        System.out.println("start method two");
        System.out.println("end method two");
}
```

If accessed by multiple threads operating on the same object, would it be possible to see the following output:

```
start method one
```

```
start method one
end method one
end method one
```

For full credit, explain your answer.

Question 13

5 pts

Consider the following code and assume the methods are in the same class.

```
public synchronized void methodOne() {
        System.out.println("start method one");
        System.out.println("end method one");
}

public void methodTwo() {
        System.out.println("start method two");
        System.out.println("end method two");
}
```

If accessed by multiple threads operating on the same object, would it be possible to see the following output:

```
start method one
start method two
end method one
end method two
```

For full credit, explain your answer.

Question 14

10 pts

List ***all*** possible program outputs for the multithreaded program below.

```
public class Worker implements Runnable {
        private String message;

        public Worker(String message) {
                this.message = message;
        }

        public void run() {
                System.out.println(message);
        }

        public static void main(String[] args) {
                Thread t1 = new Thread(new Worker("hello"));
                Thread t2 = new Thread(new Worker("goodbye"));
                t1.start();
                System.out.println("the end");
                t2.start();
```

```
        }
}
```

Question 15 5 pts

What is the purpose of the Inverse Document Frequency (IDF) portion of the TF-IDF score? For full credit make sure to thoroughly explain your answer.

Question 16 5 pts

Assume you have parsed the following JSON document into a variable named jsonobject. Write one (or more) lines of code to print the second element of the array myArray.

```
{
  "string": "Hello World",
  "myObject": {
    "myArray": [true, false, true, true],
    "myNumber": 5
  }
}
```

Question 17 3 pts

Questions 16 through 20 refer to the following two classes:

```
public abstract class Beverage {

        protected int ounces;

        public int getSize() {
                return this.ounces;
        }

        public void drink() {
                System.out.println("Mmm, tasty");
        }

        public abstract String getServingGlass();
}

public class Coffee extends Beverage {

        protected boolean isDecaf;

        public Coffee(boolean isDecaf) {
                this.isDecaf = isDecaf;
        }
```

```
	public String getServingGlass() {
		return "Cup";
	}

	public boolean isDecaf() {
		return this.isDecaf;
	}

	public void drink() {
		System.out.println("Wow, that's hot!");
	}
}
```

What is the output of the following fragment of code? If the code will cause an error, explain the error.

```
Coffee c = new Coffee(false);
System.out.println(c.getSize());
```

Question 18 3 pts

Considering the classes defined in Question 16 - Inheritance, what is the output of the following fragment of code? If the code will cause an error, explain the error.

```
Beverage b = new Beverage();
System.out.println(b.getSize());
```

Question 19 3 pts

Considering the classes defined in Question 16 - Inheritance, what is the output of the following fragment of code? If the code will cause an error, explain the error.

```
Beverage b = new Coffee(false);
System.out.println(b.isDecaf());
```

Question 20 3 pts

Considering the classes defined in Question 16 - Inheritance, what is the output of the following fragment of code? If the code will cause an error, explain the error.

```
Beverage b = new Coffee(false);
b.drink();
```

Question 21 3 pts

Considering the classes defined in Question 16 - Inheritance, what is the output of the following fragment of code? If the code will cause an error, explain the error

```
Beverage b = new Coffee(false);
System.out.println(b.getServingGlass());
```

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