1. (3 points) Describe the steps involved in creating and running a Java program.

2. (2 points) Declare a variable, number, that stores double-precision floating point value and assign it the value 5.9.

3. (3 points) Describe the differences between primitives and objects (reference variables).

4. (2 points) Complete the following program:

```
public class Quiz {
    public static void main(String[] args) {
        System.out.println("Please enter an integer value.");
        Scanner in = new Scanner(System.in);
        int value = in.nextInt();









        System.out.println("The negative of what you entered is: " + answer);
    }
}
```

1. (3 points) Consider the following code:

```
public static void main(String[] args) {
    Scanner in = new Scanner(System.in);
    try {
        String a = in.next();
        double b = in.nextInt();
        System.out.println(3/b);
    } catch (ArithmeticException e) {
        System.out.println("Dividing by zero doesn't make sense");
    } finally {
        System.out.println("Finally!");
    }
}
```

Which of the following inputs will not crash the program?

_____ 1 2 3

_____ one two three

_____ 1 0

2. (3 points) Explain why Error exceptions should not be caught in application code.

3. (4 points) How does a checked exception differ from an unchecked exception?

1. (4 points) Complete the program below that writes 1.3 and 999.2 as `double`s to a binary file called nums.bin.

```
public static void main(String[] args) {

}
```

2. (6 points) Complete the method below that reads five strings (not necessarily on separate lines) from a text file and returns the longest of the five words. If there is a tie for the longest word, you can return any one of the longest words.

```
public static String getLongest(String filename) {

}
```

1. (4 points) Arrange the following lines of code in the correct order to produce a program that asks the user to enter a phrase and displays "that's a lot of letters" if the phrase is more than 100 characters long. Order the lines by placing a number at the beginning of each line to indicate the order of the lines.

```
if (phrase.length() > 100) {

public class Quiz2 {

public static void main(String[] args) {

Scanner in = new Scanner(System.in);

String phrase = in.nextLine();

System.out.println("Please enter a phrase");

System.out.println("that's a lot of letters");

}

}

}
```

2. (1 point each) Indicate what will be displayed by each of the following lines of code. If the code will instead cause an error, indicate that.

```
System.out.println(8 + 2 / 5 - 1);


System.out.println(2.0 + 3 * 2);


System.out.println(3 % 8);


System.out.println("abc" + 5);


System.out.println(5 < 8 && 5 < 2 && 2 < 8);


System.out.println(!(5 != 8) || !(5 < 2));


System.out.println((double)Integer.parseInt("1"));
```

1. (8 points) Complete the program below.

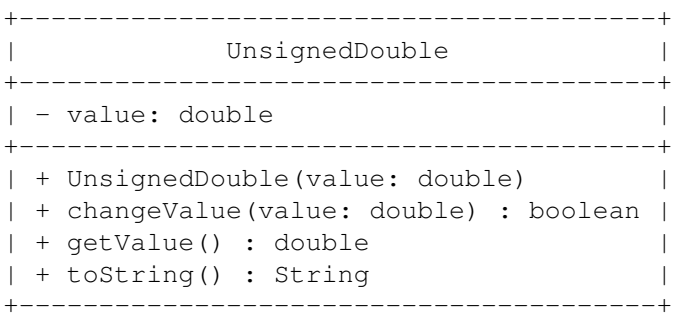
```
/**
 * A program that asks the user to enter a long sequence of digits. The program
 * then displays the number of times three consecutive digits increase in magnitude.
 * Examples:
 *   INPUT        -> OUTPUT | Increasing sequences
 * - "123234"     -> 2      | "123" and "234"
 * - "321222210"  -> 0      | none
 * - "12330489"   -> 3      | "123", "048", "489"
*/
public class Quiz3 {
    public static void main(String[] args) {
        System.out.println("Please enter a long sequence of digits");
        Scanner in = new Scanner(System.in);









        System.out.println("There were " + count + " sequences of increase digit triplets");
    }
}
```

2. (1 point) How confident are you in your command of the material covered in class this semester?

Very confident — Somewhat confident — Not very confident — Not confident at all

3. (1 point) What concept are you least confident in your understanding?

1. (10 points) Provide the full implementation for the class described in the following UML class diagram. The class should function in a similar way to the UnsignedInteger class developed in lecture.



1. (5 points) Implement the minus(subtrahend: double) : Complex method from the class exercises for Monday of this week.

2. (5 points) Implement the deposit(amount: double) : int method from lab 6.

1. (5 points) Explain the difference between a class variable, a local variable, and an instance variable. Give an example of each.

2. (5 points) Consider the code provided on the backside. Refactor it so that it follows better coding practices.

```
public class Driver {
  public static void main(String[] args) {
    Scanner in = new Scanner(System.in);
    System.out.print("Hours: ");
    String h = in.nextInt();
    System.out.print("Minutes: ");
    String m = in.nextInt();
    System.out.print("Seconds: ");
    String s = in.nextInt();
    Time time1 = new Time();
    time1.setHours(h).setMinutes(m).setSeconds(s);
    System.out.print("Hours: ");
    h = in.nextInt();
    System.out.print("Minutes: ");
    m = in.nextInt();
    System.out.print("Seconds: ");
    s = in.nextInt();
    Time time2 = new Time();
    time2.setHours(h)
    time2.setMinutes(m)
    time2.setSeconds(s);
  }
}
```

1. (5 points) Implement a method, containsEven(), that accepts an array of ints and returns true if the array contains one or more even values.

2. (5 points) Implement a method, shiftRight() that accepts an array of strings and returns an array of strings where the returned array is "right shifted" by one. For example, if {"a", "b", "c"} is passed to the method, {"c", "a", "b"} should be returned.

1. (3 points) Explain the different between pre-increment and post-increment.

2. (7 points) Show the complete contents of a file Spinnable.java that contains an interface called Spinnable that has a method called spin() that accepts no arguments and returns a `double` representing the resulting orientation of the object as an angle, in radians.

Consider the following declarations:

```
public interface Gradable {
    final double MAX_GRADE = 100;
    double grade();
}

public class abstract Assignment implements Gradable {
    // ...
}

public class Quiz extends Assignment {
    // ...
}

Gradable gradable;
Assignment assignment;
Quiz quiz;
```

Which of the following could be legal statements?

_____ int grade = Gradable.MAX_GRADE;

_____ gradable = null;

_____ gradable = assignment;

_____ gradable = new Assignment();

_____ gradable = new Quiz();

_____ assignment = new Gradable();

_____ assignment = new Assignment();

_____ assignment = new Quiz();

_____ quiz = assignment;

_____ quiz = new Quiz();