

ECE122 Spring 2008

Homework 2

Due February 21st 2008 (before the start of lecture).

1.) In lecture, Prof. Tessier talked extensively about references. What is a reference? How are references used? Do primitive values require references? Why or why not? Do objects require references? Why or why not? What happens to an object if it has no references?

2.) Write a method with a statement that concatenates a String and a double. Put a space between them. Show a screenshot of the method working.

3.) For the following example of a class, use the fewest number of import statements needed to make it compile. Which import statement is automatic?

```
public class homeworkExample
{
    public static void main (String args[])
    {
        Random generator = new Random();
        Scanner scan = new Scanner(System.in);
        int varI = scan.nextInt();
        double varD = Math.abs(generator.nextInt());
        double printable = varD*varI;
        DecimalFormat df = new DecimalFormat("0.###");
        System.out.println(df.format(printable));
    }
}
```

4.) What is the range of results of the following statements? Assume that *rand* is an instance of the Random class and that it has already been initialized.

- a) `double number = rand.nextInt(101) * rand.nextDouble();`
- b) `double number = rand.nextInt() - Integer.MAX_VALUE;`
- c) `double number = 7 * rand.nextDouble();`
- d) `double number = rand.nextInt(100)/100;`

5.) Write a method that calculates the interior angle of a regular polygon. The interior angle is the angle between two adjacent sides of the polygon. The method should accept a number of sides as its parameter, and should return the interior angle of a regular polygon

with that many sides. The formula calculating the interior angle based on a number of sides n is: $180(n-2)/n$. Show a screenshot of the method working for a triangle and quadrilateral.

6.) Write a method that reads an integer and a double using an instance of the Scanner class. Add the two inputs and store the sum as a double but print the result as a floating point number. Show a screenshot of the method working. How are casting and promotion used in your method?

7.) Write a short class called AMRadio. Give it a maximum volume and minimum and maximum frequencies. Write a constructor that initializes these to the following values: maximum volume is a random integer less than 100, minimum frequency is a random integer between 500 and 600, and maximum frequency is a random integer between 900 and 1000. Write a mutator and accessor for each of these variables. Also write the following methods: tuneRadio, which sets the frequency to which the AMRadio is currently tuned in, and setVolume, sets the current volume at which the AMRadio is playing. Write accessors for both these new variables. Show a screenshot of the methods in Radio working.