HOMEWORK: Java

Please answer the following questions. Provide *your own* simple *working* examples for each case, if requested. Use the Web to find the answer to the questions that we have not covered in class. The questions are in no particular order.

Each question should be answered in its own associated directory. You should write the answers to the questions in your report, and state the directories corresponding to each question. You should also provide the source of your answers. I'll be spot-checking your replies to make sure they correspond to the sources, and to make sure the examples are original. Please do not cut and paste (which is plagiarism), but use your own wording.

Question 1

Explain the difference between shallow and deep cloning, and provide an example clearly distinguishing between the two.

Question 2

Read about the Thread class, explain its purpose and write the following program: create two threads. Each thread first sleeps 1 second and then print out the thread number. Run the code. What order to the write statements come out in? What interface must Thread implement?

Question 3

Given the following interface:

```
interface Callable {
    double eval(double);
}
```

construct a function class whose purpose is to evaluate $f(x) = sin(x)$, where x is a double. Please provide a simple program that can be executed.

Question 4

Given the interface in Question 3, I'd like to use it to evaluate a function that takes an integer argument. Is this possible? Whether the answer is yes or no, please explain your reason(s).

Question 5

Explain the usage of the Java classes Integer, Double. What is their purpose. Give one or two examples of their use.

Question 6

What is the finalize() method used in a class? Is there a destructor for Java? What's the difference between finalize method in java and the destructor for C++? Please try to write a Sample class, add a finalize() method to the class. In the finalize() method, printout to System.out the name of the class and a message related to garbage collection. Then you can create a Main class, and within the main function, create an array of 100 Sample class. Run the program. Describe what happens. Is the finalize() method ever called?