

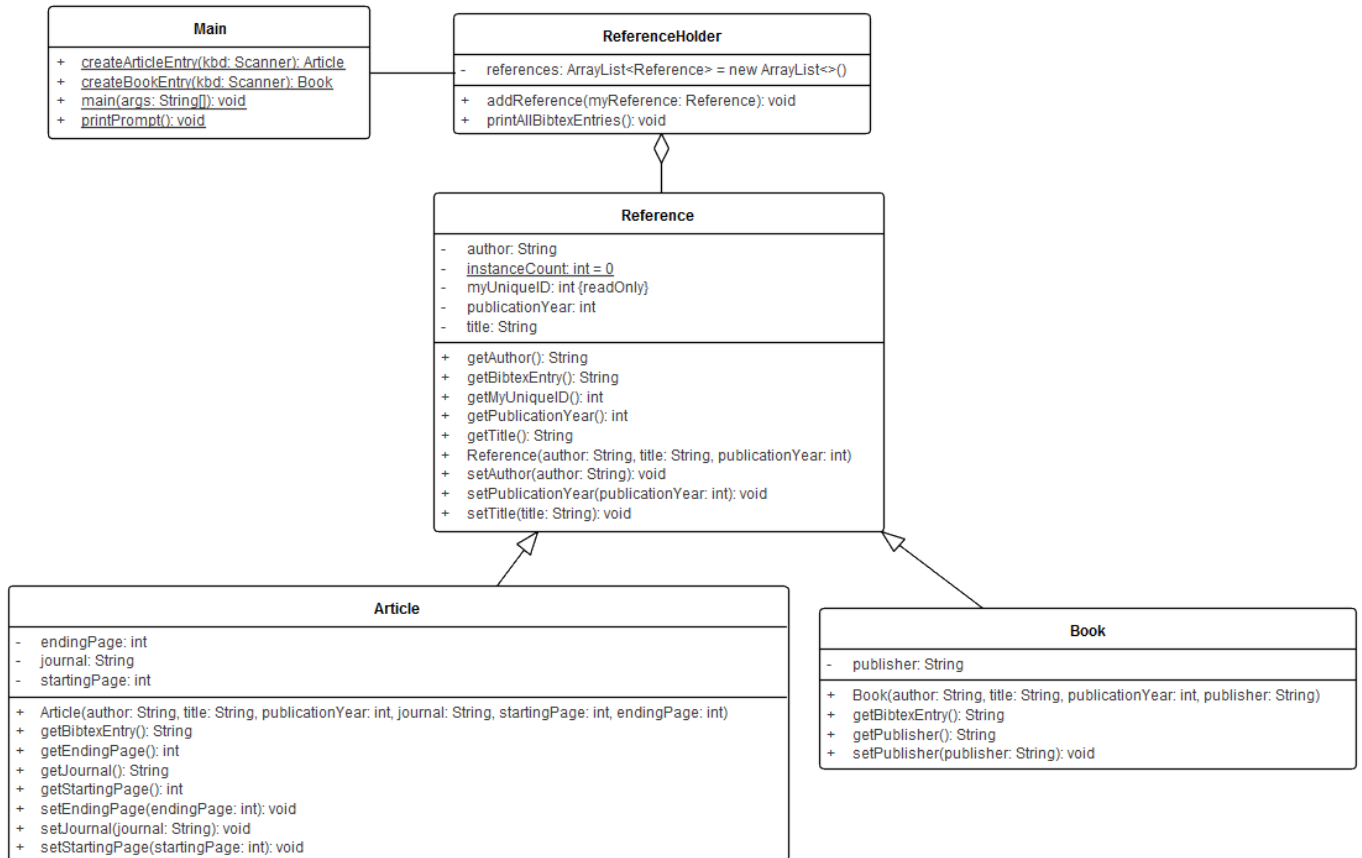
(a) According to your instructor's general course policies, when, and under what conditions may students make use of a laptop or other electronic device during lecture?

(b) Implement a method that will accept an `ArrayList` of `Strings` and return the shortest `String` in the `ArrayList`. In the event of a tie, you should return the `String` that is closest to the front of the `ArrayList`. For example, if the `ArrayList` contains the following:

```
"The", "quiz", "was", "easy", "to", "do"
```

the method should return `to`. If the `ArrayList` is `null` or empty, an empty `String` should be returned.

Consider the following class diagram from lab 2.



Which of the following are true statements?

- The Article class inherits from the ReferenceHolder class.
- The Article class inherits from the Book class.
- The Book class inherits from the Reference class.
- The constructor in the Article class has direct access to the author attribute.
- A Reference object has a publisher attribute.
- If ref is a reference of type Reference, the following call is legal: ref.getAuthor();
- If ref is a reference of type Reference that points to a Book object, the following call is legal: ref.getBibtexEntry();
- If ref is a reference of type Reference that points to a Article object, the following call is legal: ref.getJournal();

Suppose `First` is an interface with two methods: `iMethodA()` and `iMethodB()`. Suppose further that `Parent` is a class with the following methods: a constructor that accepts a `String` as an argument, an overridden `equals()` method, and `pMethodA()`.

(a) Show the class declaration (just the first line) of a `Child` that inherits from `Parent` and implements the `First` interface.

(b) List the method signatures for all of the methods that **must** be implemented by the `Child` class.

(c) List all of the reference types that can refer to a `Child` object. I.e., what can replace `XXX` in the following line of code?

```
XXX obj = new Child ();
```

(a) Assume `word` in the following code is a reference to a `String`.

```
if(word != null && 10/word.length() > 1) {  
    System.out.println("handy");  
}
```

For each of the following values of `word`, indicate which will happen: (a) Code crashes, (b) Code runs but nothing is displayed, or c Code runs and displays “handy”.

- `word = null;`
- `word = "";`
- `word = "yes";`

(b) Sketch what will be displayed when a `SimpleWindow` object (see code below) is created.

```
public class SimpleWindow extends JFrame {  
    public SimpleWindow() {  
        setSize(400, 200);  
        setLayout(new FlowLayout());  
        add(new JLabel("Golden_Retriever"));  
        add(new JLabel("Brown_Horse"));  
        setVisible(true);  
    }  
}
```

(c) Suppose that the `setLayout()` call in the above constructor is removed. How would the sketch in part (b) change?

(a) Explain the differences between an inner class and an anonymous inner class. When is one more appropriate than the other?

(b) Implement an action listener that will display “I found the answer” in a pop-up window whenever the event source it is connected to initiates an action event.

```
public static void main(String[] args) {
    Scanner in = new Scanner(System.in);
    try {
        int i = in.nextInt();
        double x = -1.0;
        System.out.println(i*x);
        x = in.nextInt();
        System.out.println(i*x);
    } catch(RuntimeException e) {
        System.out.println("ouch");
    }
    System.out.println("done");
}
```

Consider the code above and indicate what will be displayed if the user were to enter the following input.

(a)

3 5

(b)

thirty three

(c)

8 30.0

(a) (10 points) Create a customized class, `QuizException`, that can be thrown by the following command:

```
throw new QuizException("Question is laboring");
```

(b) (5 points) Is `QuizException` a checked or unchecked exception? Justify your answer.

Consider the lab assignment you have been working on (Lab 8).

(a) What is the purpose for the `EmptyPicture` class?

(b) What is the purpose of the `lastFile` attribute in the `Picture` class? Why is it declared `protected` instead of `private`?

(c) The `PPMPicture` class has two constructors: `PPMPicture()` and `PPMPicture(BufferedImage buffer)`. When did you use each of them in your implementation of the week 8 assignment?

Consider the following level of the application we have developed over the last week in lecture. Provide the list of keystrokes needed to complete this level.

