# Interfaces Return to:

Team members present:

#### Task – Review from lab

The lab reviewed polymorphic behavior in class families. Discuss the following with your teammates.

1. How did you solve the problem of making text private in the parent class, Document?



1. Given the abbreviated UML above, if we declare formatted to be a FormattedDocument object and send it the message getDescription(), what code is executed and why?
2. Continuing with this same example, if getDescription sends a message this.getLineCount(), what code will execute? Why?

#### Task – Interface Introduction

1. How are interfaces and inheritance the same?
2. How are interfaces and inheritance different?
3. How are abstract classes and interfaces the same?
4. How are abstract classes and interfaces different?
5. Write the first line of a class named Item which implements an interface called Comparable.
6. Write the first line of a class named Produce which implements which inherits from GroceryItem and implements an interfaces called Taxable and Weighable.

#### Task – Extending Interfaces

Given the model of a set of classes, answer the following questions:

1. Which classes are abstract?
2. Which classes are concrete?
3. Which classes are interfaces?
4. What interface(s) must Book implement?(assume it is not implemented at a higher level)
5. What interface(s) must Video implement? (assume it is not implemented at a higher level)
6. What method(s) must CD implement? (assuming they are not implemented at a higher level).
7. Can LibraryItem implement Locatable? In other words, can LibraryItem have a concrete method getLocation?
8. If LibraryItem can implement Locatable, does CD also have to implement its own version?
9. What method(s) must ReferenceBook implement? (assuming they are not impmented at a higher level)

#### Task – What is legal? Indicate which will compile and execute (C & E), not compile (!C), or compile but not execute(C & !E) Assume that all classes have a default constructor.

When finished with this task, post your answers (with question numbers) on the Board.

Given the chart and assuming that only the interface methods have been implemented where they need to be, which of the following are legal Java statements. If it is not a legal statement(s), indicate why the operation will fail.

1. ArrayList<Loanable> checkOutItems;
2. ArrayList<LibraryItem> carrierLibrary;
3. Locatable [] wheresStuff;
4. Loanable myBook = new LoanableBook();
5. Locatable myBook = new Locatable();
6. LibraryItem myBook = new CSItem();
7. Loanable thing = new CSItem();
8. ArrayList<Loanable> checkOutItems;

checkOutItems = new ArrayList<Loanable>();

checkOutItems.add(new CSItem());

checkOutItems.add(new Video());

1. continuing with the example in #8 (assuming we have fixed any problems that occur)

checkOutItems.get(1).getLocation();

1. continuing with the example in #8 (assuming we have fixed any problems that occur)

checkOutItems.get(0).getLocation();

Use this declaration for the following questions.

Loanable item;

1. item = new CD();
2. continuing with number 11:

item.isDue();

1. continuing with number 11:

item.getLocation();

#### Task – Your turn. Develop 5 statements using this model (different from the ones above) that you feel will compile and run and 5 statements that will either fail to compile or fail to run. Use the above models for examples. You may have a single set of declarations or other statements and drop the questions from that.