48024 Applications Programming

Dr Angela Huo

Contents

Pre: Open Question Board(https://padlet.com/angelahuo/appsprog)

- Announcement
- Lab6 Review
- Assignment 1
- Key points of Study 7
- Lab7 Preview

Announcement

- Lab 5 grade has been published on Canvas.
- Lab class change:
    - CMP02: Padraic (Paddy) Heaton
    - CMP03: Padraic (Paddy) Heaton
    - CMP12:
        - Online: join CMP11(Default)
        - On campus: join CMP08 (email the subject coordinator for lab change)

Announcement

- ED --- Labs have been listed on ED and the previous blocking has been removed.
- Canvas:
    - Demo page: Both Java and Python solutions for tutor demo
    - Lab page: LabGuide for each lab’s instruction.
- U:PASS

  Thursday 10:00-11:00 CB06.03.053
  Friday 13:00-14:00 CB11.05.200
- HELPS

  https://www.uts.edu.au/current-students/support/helps

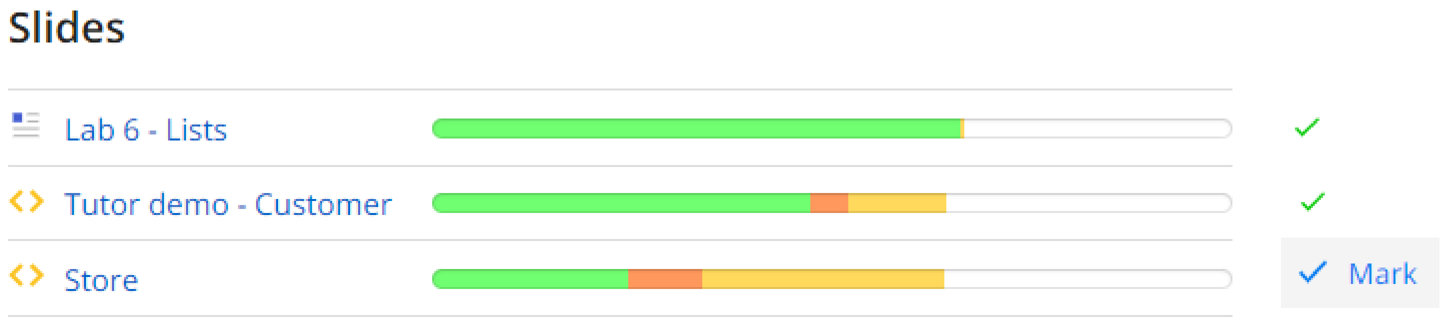
Post your question to https://padlet.com/angelahuo/appsprog

Announcement

- Consultation session
    - Time of this week:
        - Online: 3:30-4:00pm
        - On campus: 4:00-4:30pm
    - If you haven't received the time change email, then the consultation will not change.
    - If the consultation doesn't work due to delay or unexpected issue, feel free to book another time with the subject coordinator.

Lab 6 Review

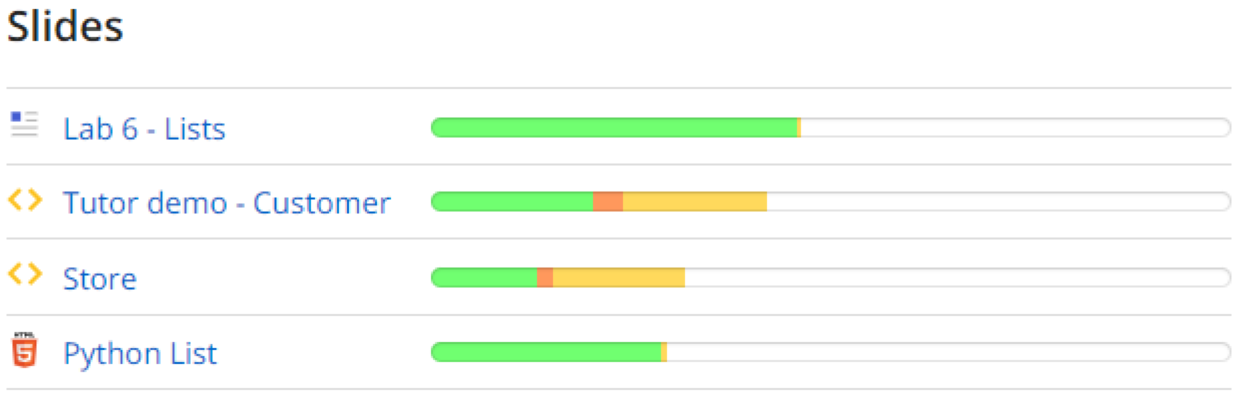
Java: ✓



Slides

- Lab 6 - Lists ✓
- Tutor demo - Customer ✓
- Store ✓ Mark

Python:



Slides

- Lab 6 - Lists
- Tutor demo - Customer
- Store
- Python List

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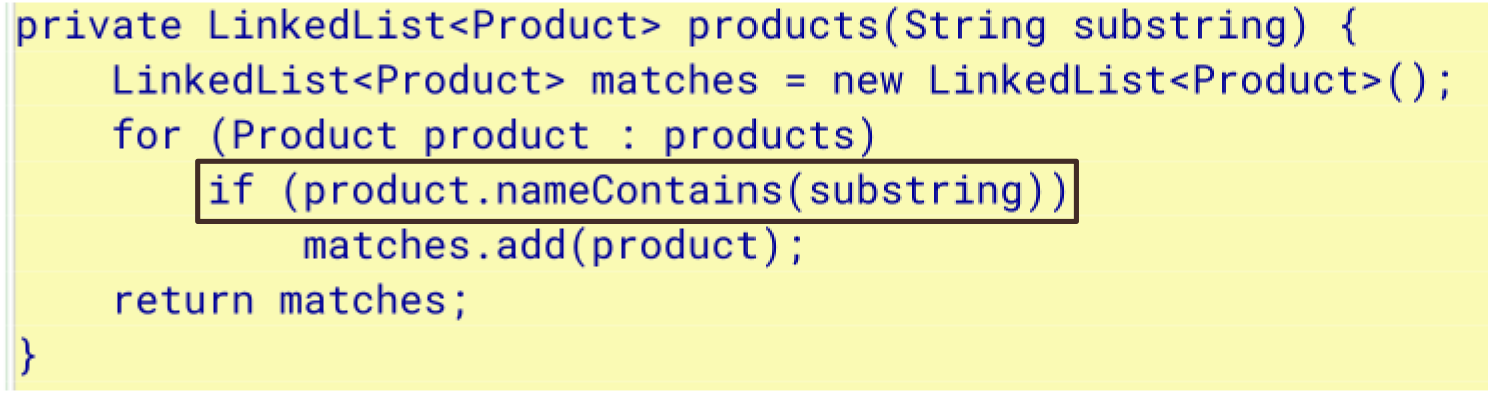
Advanced Functions



```
private LinkedList<Product> products(String substring) {
    LinkedList<Product> matches = new LinkedList<Product>();
    for (Product product : products)
        if (product.nameContains(substring))
            matches.add(product);
    return matches;
}
```

- If (products.size()==0) No matches
- If (products.size()==1) perform as single match
- If (products.size()>1) Loop pattern, ask the user to chose one to continue

Post your question to https://padlet.com/angelahuo/appsprog

Fields and Variable

- Field is declared for class

```
public class Account {
        private String type; //field
        private double balance; //field
        .......
}
```

- Variable is declared for method

```
public boolean has($\boxed{\text{double amount}}$) {
        int n=100; //variable
        return n >= amount;
}
```

FAQ of Assignment 1

- Question Board
  - Rubric:
    - Spoofing
    - Field, libraries, class definition should not be modified
  - Design Rules: patterns(i.e. boolean function), OOP rules(Study 5)
- Consultation is available in U:PASS, HELPS as well.

Post your question to https://padlet.com/angelahuo/appsprog

Bad boolean functions

- Bad:

```
boolean isDry(int rain) {
    if (rain == 0)
        return true;
    else
        return false;
}
```

- Good:

```
boolean isDry(int rain) {
    return rain == 0;
}
```

- No need to test if (rain == 0). It is a boolean. Just return it.

Design rule #2: Push it right

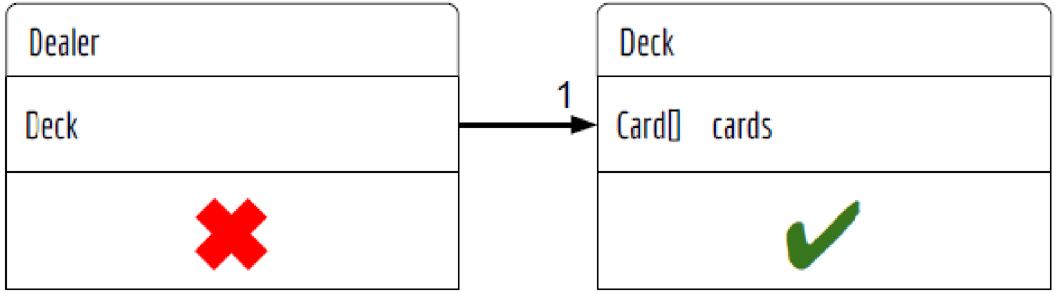
Goal: Shuffle a deck of standard playing cards.

Question: Which class is responsible?

a) ~~The dealer should shuffle the deck.~~ (The cards are private inside the deck)

b) The deck should shuffle itself. (YES: the deck has direct access the cards)

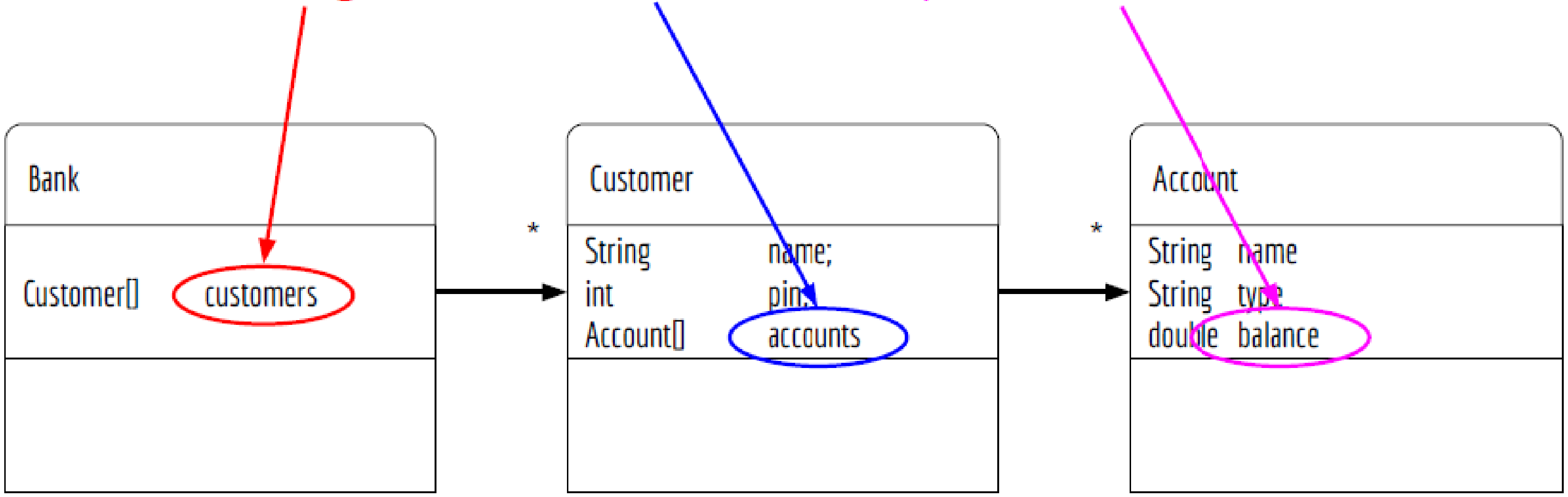
Payoff: The deck is more useful. The shuffle method is more reusable.



Design rule #3: Spread plans across classes

Goal: Use a customer's account at the bank.

Scenario: User logs in, selects an account, deposits or withdraws.

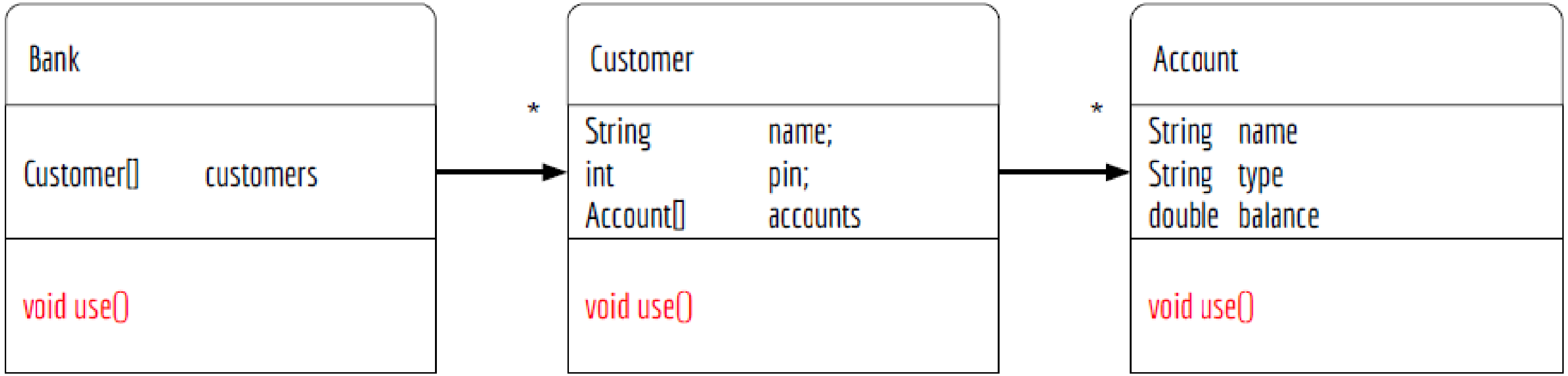


Question: Which class is responsible? **Answer**: ALL classes are responsible!

Design rule #3: Spread plans across classes

Goal: Use a customer's account at the bank.

- Convention: Use the same method name across classes for the same goal.



Design rule #4: Hide by default

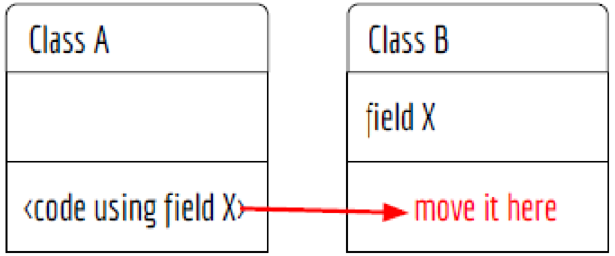
- Make everything private unless there is a reason to make it public.
- Make all fields private.
- Make methods private if no other class needs to use them.
- Make methods public only if other classes need to use them.

Design rule #4 (again!): Hide by default

- Getters and setters export a field.
- Almost like making a field public.
- Avoid using getters and setters.

There is usually a better way!

- If code in class A needs to get access to a field in class B, consider moving the code into class B.
- See design rule #2: "Push it right"



From: Classes: 38/70

Key points of Week 7

- **Java 8 installation** Study 7 Assessment – 2%
- Interfaces(Page 11) each class is going to have its own implementation
  - Polymorphism--A set of methods that different classes may implement.
- Super classes(Page 21) reuse the same implementation across classes
  - Abstract method
  - Inheritance--A set of fields and methods that different classes may inherit.
  - @Override

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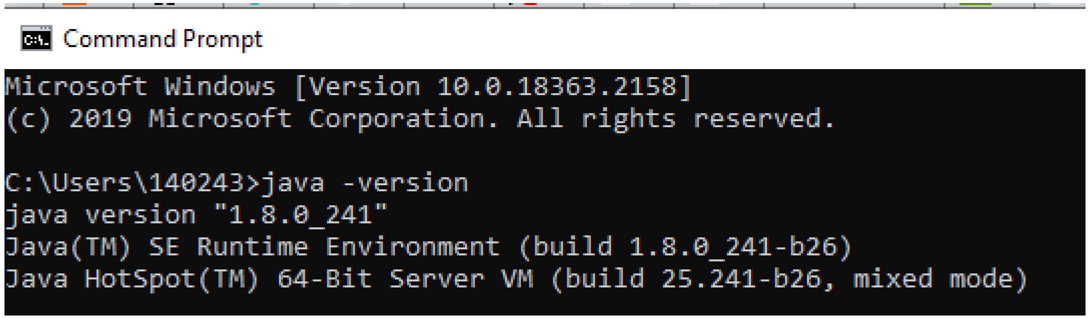
Java 8 installation Study 7 Assessment - 2%

- Check the JDK version:



```
Microsoft Windows [Version 10.0.18363.2158]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\140243>java -version
java version "1.8.0_241"
Java(TM) SE Runtime Environment (build 1.8.0_241-b26)
Java HotSpot(TM) 64-Bit Server VM (build 25.241-b26, mixed mode)
```

- If more than one JDK installed, please set JDK1.8 as default:
  - OS: https://www.onlinetutorialspoint.com/java8/java-8-how-to-set-java_home-on-windows10.html
  - NetBeans: https://canvas.uts.edu.au/courses/22120/files/2924559?wrap=1

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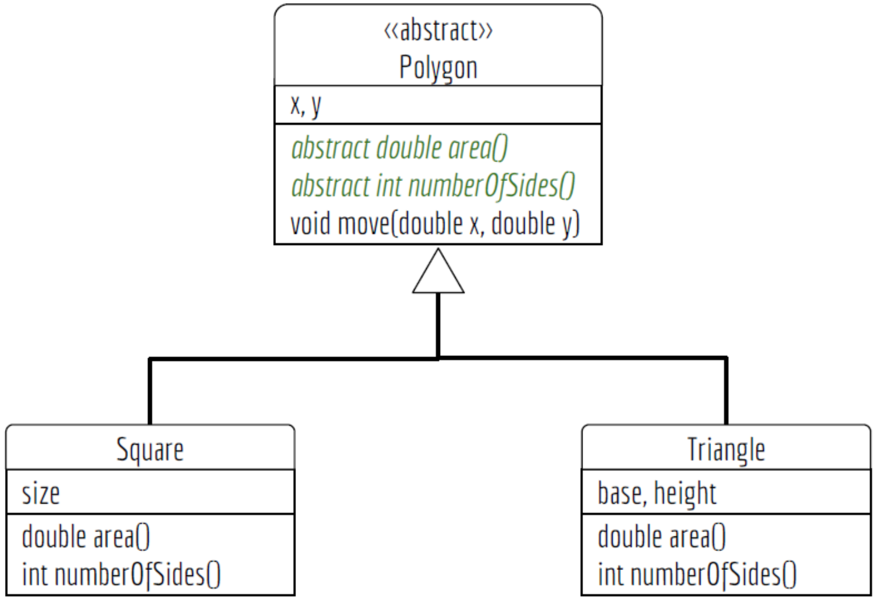
Inheritance

- Common methods and fields



- Constructor

$$\begin{tikzcd}\text{Polygon()} \arrow[d] \\ \text{Square()/Triangle()}\end{tikzcd}$$

Deconstruct process:

$$\begin{tikzcd}\text{Square()/Triangle()} \arrow[d] \\ \text{Polygon()}\end{tikzcd}$$

- Superclass: if you want to reuse the same implementation across classes
- Interface: If each class is going to have its own implementation

Quiz

- Which one is multiple classes implementing the same interface?
  a) Dealer and Player implement the Person interface
  b) Square and Triangle implement the Polygon interface
  c) LinkedList and ArrayList implement the List interface
  d) All above

Quiz

- What is the benefit of Dealer and Player implementing the same interface?(Multiple answers)
  a) You can store players and dealers into the same list and treat them in the same way.
  b) The benefit of polymorphism.
  c) A set of methods that players and dealers may implement.
  d) A set of fields and methods that players and dealers may inherit.
  e) None above

Quiz

What will this print?

```
B b = new B();
b.foo();
b.bar();
```

a) hello
   goodbye
   bar

b) goodbye
   bar

c) goodbye
   hello
   bar

```
public class A {
    public void foo() {
        System.out.println(“hello”);
    }
    public void bar() {

        System.out.println(“bar”);
        }
}

public class B extends A {
        @Override
        public void foo() {

        System.out.println(“goodbye”);
        }
}
```

Post your question to https://padlet.com/angelahuo/appsprog

Quiz

What will this print?

```
A a = new B();
a.foo();
a.bar();
```

a) hello
   bar

b) goodbye
   bar

c) hello
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```
public class A {
    public void foo() {
        System.out.println(“hello”);
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        System.out.println(“bar”);
    }
}

public class B extends A {
        @Override
        public void foo() {

        System.out.println(“goodbye”);
        }
}
```

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Lab 7

- Pre-lab Install Netbeans and get your codes ready!
- 20 min Intro + Demo
- Remaining time – Assignment support

- NOTE:
    - Study 7 is critical preparation for the following classes. DO NOT SKIP!!!
    - Any question related to IDE that could not be solved by the instruction, you need to consult your tutor in the lab or book an consultation session.

Post your question to https://padlet.com/angelahuo/appsprog

Contact

- Subject Coordinator and Lecturer: Angela Huo
- Email: huan.huo@uts.edu.au
- Contact information on Canvas

See you next week!

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