

## Lab 11 : Idioms and Inheritance

**Topics covered** for loops, programming idioms and inheritance

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**Exercise 1:** What does the following loop do? Find a more clear way to write the loop.

```
int x = 5;
for(boolean b = true; b; ) {
    if(x < 2) {
        b = false;
    } else {
        System.out.println(x);
    }
    x--;
}
```

**Exercise 2:** Write a method `String arrayToString(int[] numbers)` that turns an array of integers into a String of comma-separated values.

```
int[] values = {1, 2, 3, 4};
String readable = arrayToString(values);
System.out.println(readable);
```

Should print:

```
1, 2, 3, 4
```

**Exercise 3:** Given the code below, write the method `Person findYoungest(Person[] people)` that finds the `Person` who is the youngest.

```
class Person {
    public int age;
    public String name;
    public Person(String name, int age) {
        this.name = name;
        this.age = age;
    }
}

public class PersonSearch {
    public static void main(String[] args) {
        Person[] people = new Person[] {
            new Person("Alice", 32),
            new Person("Bob", 51),
            new Person("Carol", 15),
            new Person("Dylan", 5),
            new Person("Erin", 25),
            new Person("Frank", 48)
        };

        Person youngest = findYoungest(people);
        System.out.println("Youngest: " + youngest.name);
    }
}
```

**Exercise 4:** A pizza shop decides to buy a pizza-making robot PizzaBot5000. The robot knows how to make a vege pizza, and knows the following information about a pizza:

- A pizza has a name: “Vegetarian”
- A pizza has a price: \$6.50
- A pizza has a list of ingredients: dough base, mushroom, tomato, onion, cheese, olives
- A pizza can be `cooked` with the ingredients placed on the base
- A pizza is edible when it is cooked
- An edible pizza can be `sliced` into 8 pieces
- A sliced pizza can be `packed` into a box
- A packed pizza can be `delivered`

Create a class `VegePizza` to simulate this information. Store appropriate variables, and create appropriate methods.

**Exercise 5:** The pizza shop wants to expand its options. They want PizzaBot5000 to be able to make other pizzas: mexicana, magherita and seafood. They want all pizzas to be available in different sizes: small, medium and large, and all pizzas can be cut into 4 or 8 slices.

**Part 1.** What similarities are there between the types of pizza? What differences are there?

**Part 2.** Are there any behavioral differences between the pizzas? How is the data accessed for one pizza type, and does this change between types?

**Part 3.** How would you change the code base to accommodate these changes? Do we need more classes? If yes, what classes? If not, can you suggest a change that would require new classes?

**Exercise 6:** Write a method to find the largest number in an array of `doubles`.

**Exercise 7:** Write a method `int findAgeOf(String name, Person[] people)` that searches through the array of `Person` objects to find the age of the person with the given name. If the person is not in the list, it should return -1.

**Exercise 8:** Write a method `int[] findMultiplesOf(int x, int[] values)` that searches through the array `values` and returns a new array of all integers that are a multiple of `x`.

**Exercise 9:** Write a method `void halfEvens(int[] values)` that will divide all even numbers in the array `values` by 2.