

## AP Java Lab 2.2 - People

Date: 11/20/2017

### Topics:

- **Creating a class hierarchy**
- **Abstract classes and inheritance**

### Your Mission:

*To create a set of Java classes that represents a basic school system.*

#### **Public Abstract Class Person**

##### **Fields:**

FirstName, FamilyName, **two more that you create**

##### **Methods:**

Constructor - must initialize fields  
getFirstName() - returns first name  
getFamilyName() - returns family name  
abstract method toString()

#### **Public Class Student Extends Person**

##### **Fields:**

double GPA, two more that you create

##### **Methods:**

Constructor - must initialize fields, and must call super constructor  
getGPA() - returns GPA  
toString() - returns the student's "FamilyName, FirstName"

#### **Public Class Teacher Extends Person**

##### **Fields:**

String Subject, String Title //Mr, Ms, Mx, Mrs

##### **Methods:**

Constructor - must initialize fields, and must call super constructor  
getSubject() - returns Subject String  
toString() - returns "Title. FamilyName"

#### **Public Class Classroom**

##### **Fields:**

Person[] students;  
Person teacher;

##### **Methods:**

Constructor - must initialize fields  
getSubject() - returns the teacher's subject  
classAverage() - add up the GPAs of all students and divide by # of students  
printClass() - Print the class Teacher then subject then all students in the class

## **Public Class Runner**

### **Fields:**

Static String[] firstNames; //a pre-made list of first names

Static String[] familyNames; //a pre-made list of family names

### **Methods:**

public static void main(String[] args)

- Declare and initialize a teacher, an array of students, and a classroom
- Print Class, and print class Average.

randomStudent() - builds a random student with a random first name, last name, and GPA

### **Extra Credit:**

Add a sort students method to the Classroom that will allow us to sort student alphabetically by family name. This method must update the students field in classroom.