CLASS 1: JAN 26
OUTLINE

• Introduction
• Course overview and goals
• Introduction to Java
• Java to Python reverse engineering
• Syllabus
• (if time) First data structure
Why is programming so hard?

Anything that is easy on a computer... is easy because a software developer worked really hard.
THE ART OF PROGRAMMING

With a partner:

1) Names (be ready to introduce your partner to the class!)

2) What you did for winter break

3) Brainstorm how or why programming might be considered an art

4) Example of software you have used that you would consider artistic
COURSE GOALS

• Essential Data Structures and Algorithms

• Java Programming Language

• Ability to choose an effective data structure for a new task

• Relating theory and programming details

• Confidence to learn a new language in the future

• Coding style and workflow practices
public class AddTax {

  public: visible to the world
  private: visible only within the class
      (usually classes are public)

}
public class AddTax {

    public static final double TAXRATE = 0.0625;

    // static: makes this field global

}
public class AddTax {
    public static final double TAXRATE = 0.0625;
}

static: makes this field global

final: makes this field immutable
public class AddTax {

    public static final double TAXRATE = 0.0625;

}

**static**: makes this field global

**final**: makes this field immutable

**double**: type of the field, you must declare the type!
public class AddTax {

    public static final double TAXRATE = 0.0625;

    private static double addTax(double stickerPrice) {
        double finalCost = (1 + TAXRATE) * stickerPrice;
        return finalCost;
    }

}
public class AddTax {
    public static final double TAXRATE = 0.0625;

    private static double addTax(double stickerPrice) {
        double finalCost = (1 + TAXRATE) * stickerPrice;
        return finalCost;
    }
}

return type: methods can either return a type or return “void”

argument(s): like python, but you must declare their type
public class AddTax {

    public static final double TAXRATE = 0.0625;

    private static BufferedReader stdin =

        new BufferedReader(new InputStreamReader(System.in));

    private static double addTax(double stickerPrice) {

        double finalCost = (1 + TAXRATE) * stickerPrice;

        return finalCost;

    }

    public void main(String[] args) throws IOException {

    }

}
```
public class AddTax {
    public static final double TAXRATE = 0.0625;
    private static BufferedReader stdin =
        new BufferedReader(new InputStreamReader(System.in));
    private static double addTax(double stickerPrice) {
        double finalCost = (1 + TAXRATE) * stickerPrice;
        return finalCost;
    }
    public void main(String[] args) throws IOException {
        System.out.print("Please enter the price: ");
        String line = stdin.readLine();
        double stickerPrice = Double.parseDouble(line);
        double finalCost = addTax(stickerPrice);
        System.out.println("The final cost is "+ finalCost);
    }
}
```
public class AddTax {
    public static final double TAXRATE = 0.0625;
    private static BufferedReader stdin =
        new BufferedReader(new InputStreamReader(System.in));
    private static double addTax(double stickerPrice) {
        double finalCost = (1 + TAXRATE) * stickerPrice;
        return finalCost;
    }

    public void main(String[] args) throws IOException {
        System.out.print("Please enter the price: ");
        String line = stdin.readLine();
        double stickerPrice = Double.parseDouble(line);
        double finalPrice = addTax(stickerPrice);
        System.out.println("With tax, that comes to "+ finalPrice + ".");
    }
}
public class AddTax {

    private static final double TAXRATE = 0.0625;

    private static BufferedReader stdin =
        new BufferedReader(new InputStreamReader(System.in));

    private static double addTax(double stickerPrice) {
        double finalCost = (1 + TAXRATE) * stickerPrice;
        return finalCost;
    }

    public void main(String[] args) throws IOException {
        System.out.print("Please enter the price: ");
        String line = stdin.readLine();
        double stickerPrice = Double.parseDouble(line);
        double finalPrice = addTax(stickerPrice);
        System.out.println("With tax, that comes to $" + finalPrice + ".");
    }
}
COMMON JAVA ERRORS

• Missing bracket
• No type specifier
• Omit static on a field or main
• Argument/parameter type mismatch
• Field/method out of place
• No class

(Compiler vs. Runtime Error)

Demo: AddTax in Java (Eclipse and Commandline)
GROUP ACTIVITY: REVERSE ENGINEERING

In groups of 2-3, write down what this same program would look like in Python.