# CSE 11
# Accelerated Intro to Programming
# Lecture 2

Greg Miranda, Spring 2021

This lecture is being recorded

# Announcements

- Discussion starts today @ 4pm & 5pm
- Quiz 2 due Friday @ 8am
- Survey 1 due Friday @ 11:59pm
- PA0.5 due tomorrow @ 11:59pm
- PA1 released – due 4/7

# Example

- Create a new file

```
class Examples2 {
  int rate = 20;
}
```

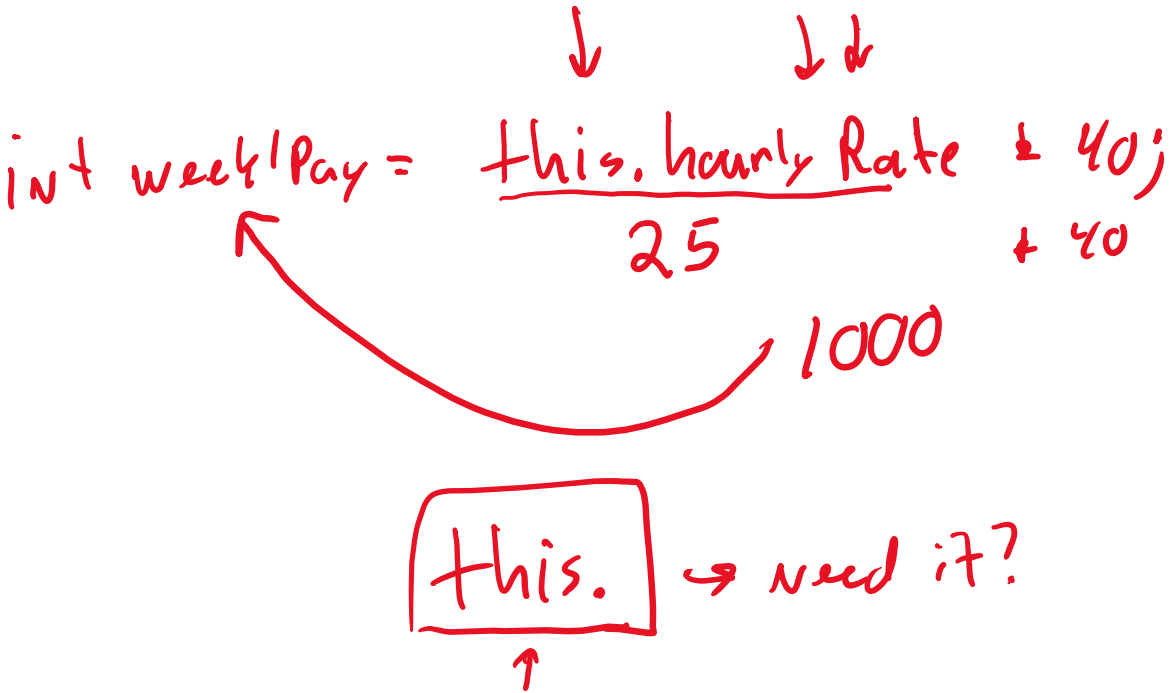
class name

- class – will talk about more later
  - For now: describes a group of fields
- Problem:
  - Calculate the pay you would receive at a certain hourly rate given a number of hours
    - New field: # of hours worked
  - Calculate total pay using Java as a calculator

- Calculate total pay (cont.)
  - Can we use these fields in another calculation?
  - Why is it useful to do this with fields instead of writing this directly?
    - What if:
      - Use same hourly rate, but a number of different weeks to calculate?
    - What if:
      - We want to change the hourly rate?
    - Change once, changes all values
      - Many times, you will have one field whose value can be used in many places
        - Configure how the program works
    - Changing the value in one spot can affect many other places in the program
      - Powerful concept in programming:
        - Define a value in one place
        - Change it by editing the program
        - Watch its changes be reflected in all the other places next time it's run

variables
constants

- Using this.hourlyRate
  - Call that a field look-up or a field access
    - Looking up the current value of a field that has been defined before



# Text

- Integers (int) – common kind of data programmers work with
- New kind of data – also really common – text
  - Examples: usernames, passwords, email, names, addresses
  - Data type for text - String
- Previous examples - had int as the type
  - int numberOfStaff = 14;
- Now – using String as the type
  - String name = “Greg Miranda”; //String value, string literal
- String className = 11;
  - What happens? Does it work? NO
- String className = “11”;
  - What happens? Does it work? Is it text or a number?

# Types

14

- int – integer type – integer literal "Greg Miranda"
- String – text type – string literal (written in double quotes)
- Java will enforce that we always
  - store string values in String typed fields
  - numeric values in numeric typed fields
- Programmer's job to get this right
  - Java will give an error message if we don't

↓

Java strongly typed language

# String

- We learned we can store Strings values in fields
  - What else can we do with them?
    - Can we add Strings together, like integers? → concatenation appends
      - String fullName = “Greg” + “Miranda”;
        - Will this work?
    - Can we multiply Strings by a number? NO
      - String str = this.firstname * 2;
    - What about Divide? Subtract? NO
    - What about +? Can we add a String and a number?
      - String str = this.firstname + 2;
        - What’s going to happen if we try this?
          - Compiler error?
          - Works? If it works, what does it store in the str field?

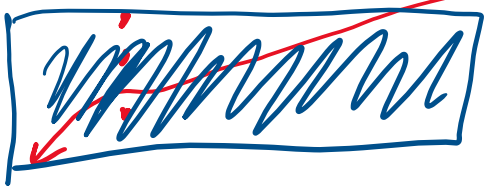
- We can + other things besides numbers to Strings and get similar behavior
  - More on this in upcoming weeks
- Adding Strings and numbers
  - Can be convenient
    - Can turn a number into text
  - Can also be confusing
    - String className = "11" + 200;
    - int klassName = 11 + "200";
      - Error
    - String klassName = 11 + "200";
  - Java does do this automatic conversion of Strings and numbers
    - Be careful in your own code

# Vocabulary

```
class Example {
  int x = 3 + 2;
  int y = this.x * 4;
}
```

class definition

field definitions
(more kinds of defs coming)

class <ClassName> {

}

"inside" the class definition

"body" of the definition

<type> <Name> = <expression>;

<type>: int, String

<Name>: x, y

= <expression>; optional: 3+2

A class def has a sequence of field def in the body

camelCase

How many field definitions are in this class?

```
1 class C {
2   int a = 10;
3   String b = 5 + "A";
4 }
```

2

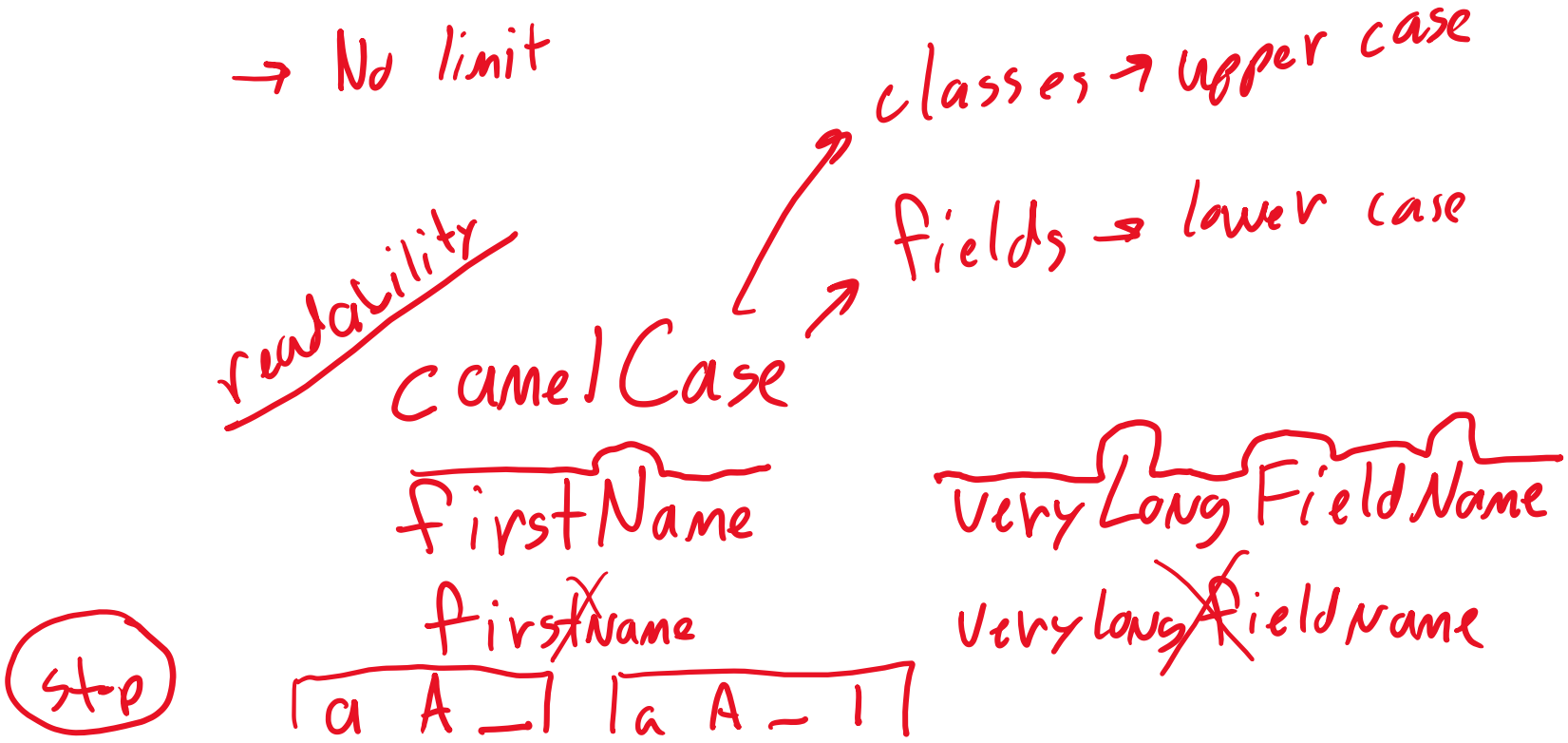
# How many field definitions are in this class?

```
1 class D {
2 ① int a = 10;
3 ② String b = this.a + " dollars";
4 }
```

10

2

Do you think there's a limit on how many field definitions can be in a class?



# Program Steps

```
class Example {
  int x = 3 + 2;
  int y = this.x * 4;
}
```

# Expressions

- int x = 3 + 2;
  - 3 + 2
    - Arithmetic expression
    - Binary operator expression
- int y = this.x * 4;
  - this.x
    - Field access expression
  - this.x * 4
    - Arithmetic expression where left hand operand is a field access expression