CSE 11
Accelerated Intro to Programming
Lecture 2

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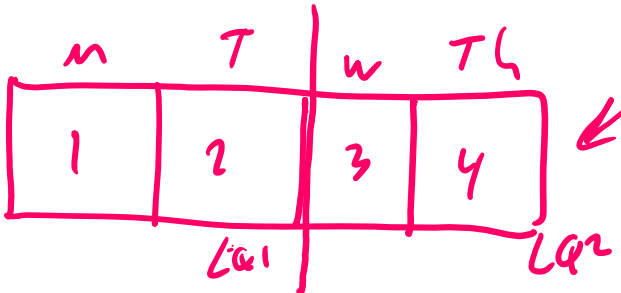
This lecture is being recorded

Announcements

- Discussion starts today @ 2pm
  - Will cover PA0.5 and PA1
- Lecture Quiz 1 released today @ 11am
  - Based on the first two lectures
- PA0.5 released yesterday – due Thursday
- PA1 released yesterday – due Thursday



String

- We learned we can store Strings values in fields
  - What else can we do with them?
    - Can we add Strings together, like integers?
      - String fullName = “Greg” + “Miranda”;
        - Will this work? yes
    - Can we multiply Strings by a number?
      - String str = this.firstname * 2;
    - What about Divide? Subtract?
    - 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?

1+1 → concatenation

NO

yes

- 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;
}
```

How many field definitions are in this class?

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

2 field defs

How many field definitions are in this class?

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

2 field def

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

NO limit in Java

Program Steps

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

Expressions

op1 + op2
−
*
\
%

assignment operator

- 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 the left-hand operand is a field access expression

Methods

- New class – MethodExample
- In programming, we often want to describe a computation once
  - Then reuse it on different numbers, or different values
  - Write once, use it over and over again
- Example:
  - Take two numbers and add up their squares
    - int sos1 = 3 * 3 + 5 * 5;
    - int sos2 = 4 * 4 + 7 * 7;

↳ num * num

↳ num^2

- Define a method to do the same thing

```
int sumSquares(int n, int m) {
  return n * n + m * m;
}
```

- Vocabulary:
  - Method definition
  - Parameters
  - Method body
    - return keyword

- Running it…
  - Method definition doesn't change what prints out or any of the fields
  - Run command – only prints out the values of the fields
- Can use sumSquares() to do the calculation
  - int ans1 = this.sumSquares(3, 5);
  - int ans2 = this.sumSquares(4, 7);
- Vocabulary:
  - Called the method
  - Arguments

- Methods: one of the building blocks for building programs
  - Not just useful for arithmetic
  - Useful for many more things
- Why do we care about methods?
  - Methods give us a centralized place to write a calculation
    - Change in one place, every place that uses the method will see that update
  - As program gets large:
    - Might have 100s of places where we want to use a formula or calculation
      - Update them all by changing one place
  - Methods are self documenting – with meaningful names
    - ↳ verbs
      actions

```
class MethodExample {

  int sumSquares(int n, int m) {

     return n * n + m * m;

  }

  int ans1 = this.sumSquares(3, 5);

  int ans2 = this.sumSquares(4, 7);
}
```

Method definition

```
class MethodExample {
  int sumSquares(int n, int m) {
     return n * n + m * m;
  }
  int ans1 = this.sumSquares(3, 5);
  int ans2 = this.sumSquares(4, 7);
}
```