BEFORE WE START

Talk to your neighbors:

# What's your favourite song right now?

#### Music: 🏶 CSE 121 25sp Lecture Tunes 🏶

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TAs:	Chloë	Hibbah	Sushma
	Ailsa	Julia	Kelsey
	Johnathan	Sahej	Shayna
	Christian	Ruslana	Hannah
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	Janvi	Ayesha	

LEC 02

#### Expressions and Datatypes

**Questions during Class?** 

Raise hand or send here

sli.do #cse121



- Announcements, Reminders
- Intro Survey Recap
- Variables Example
- Datatypes and Expressions Review
- Expressions Practice
- Combining Variables and Expressions

### Announcements, Reminders

- Creative Project 0 due <u>tonight</u> by 11:59 PM
- Programming Assignment 0 releases later today
  - making a receipt generator!
  - due Tuesday, April 15<sup>st</sup> at 11:59 PM
  - now on regular "cadence" (Wed release, due following Tue)
- IPL is open! Schedule & instructions on website.
- If you joined late, welcome!
  - Check out the <u>course website</u> and lecture recordings
  - Resubmissions are your friend!

## **Reminder: Post-Section Work**

- Due at midnight on each quiz section day (except quizzes)
  - not strictly "did you go to quiz section", though going helps
  - graded on attempt/effort <u>only</u>
  - helps your TAs plan quiz section!
- <u>Optional</u> (not part of your grade)
  - but, 12/16 give you an extra resub
  - up to you on whether or not you think it's helpful
- You will get PSW completion grades on Canvas
  - sorry! the only way for us to do this :(

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## Intro Survey – things we're excited for!

- "Learning programming" / "Learning how to code"
- "Meeting new people who are enthusiastic about [programming]"
- "creative projects!"
- "learning java"
- "Having peers (a community) and resources for this course!"

## Reassuring worries from intro survey (1/2)

Common: responses along the lines of... "not knowing how to code"

- You're in the right place! This class expects zero prior knowledge.
- If you're worried about "technical jargon", check out our <u>Glossary page</u>!

Difficulty, workload, pace, & falling behind

- Recognizing that programming can be difficult (if it was easy: why have a class?)
- As a result, have built many support systems (section, IPL, office hours, Ed, etc.)
- If you feel like you're struggling: <u>reach out early!</u>
  - Especially with pace of quarter system

## Reassuring worries from intro survey (2/2)

Grades, competitiveness, this class being a "weed-out" class

- Explicitly <u>not</u> the goal of this class
- Course is designed against this (minimum grade guarantees, resubmissions, etc.)

Quizzes & final exams (especially on paper)

- Timed assessments can be stressful but we'll build you up there slowly!
- Will have <u>many</u> practice resources (though, be wary of overfitting!)
- Practicing on paper can help a lot!

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## **PCM:** Data Types & Expressions

- Programming is about data; we tell Java what **type** of data we have!
- Data types (so far): int, double, String, boolean
  - note: only String is capitalized!
- <u>All</u> values in a (Java) program have a type!
  - some are "obvious", e.g. 42 or "hello world"
    - aside: these are called "literals"
  - some are more complicated **expressions**!

## **PCM: Operators**

We learned a *ton* of operators!

#### Numerical:

- + Addition
- - Subtraction
- \* Multiplication
- / Division (tricky!)
- % Modulo (or "mod")
- <, >, <=, >=, ==, != Relational

#### Strings:

+ Concatenation (not addition!)

#### **Booleans:**

- ! Logical Not
- && Logical And
- || Logical Or
- == and != Relational

### **PCM:** Precedence

Operators have precedence (an order of operations).

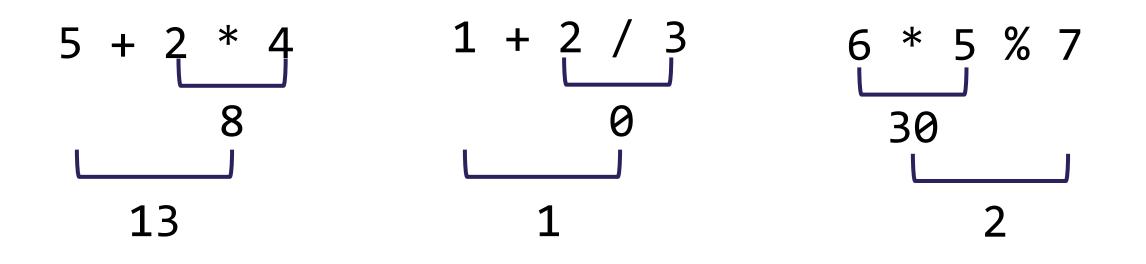
In Math:

- **1. P**arentheses
- 2. Exponent
- 3. Multiplication
- 4. Division
- 5. Addition
- 6. Subtraction

In Java:

- 1. Parentheses
- 2. Logical not
- 3. Multiplication, Modulo, Division
- 4. Addition (and concatenation), Subtraction
- 5. Relational operators
- 6. Equality operators
- 7. Logical AND
- 8. Logical OR

#### **Expressions in "little steps"**



### **PCM: Conversions**

When mixing types in an expression, Java will <u>convert</u> one type to the other and then perform the operation "normally".

Some conversions are straightforward:

- ints can be converted to doubles (add .0)
- ints and doubles can be converted to Strings (add "")

So, Java does these for you! (is this good? controversial!)

## **New:** Conversions (Gone Wrong!!)

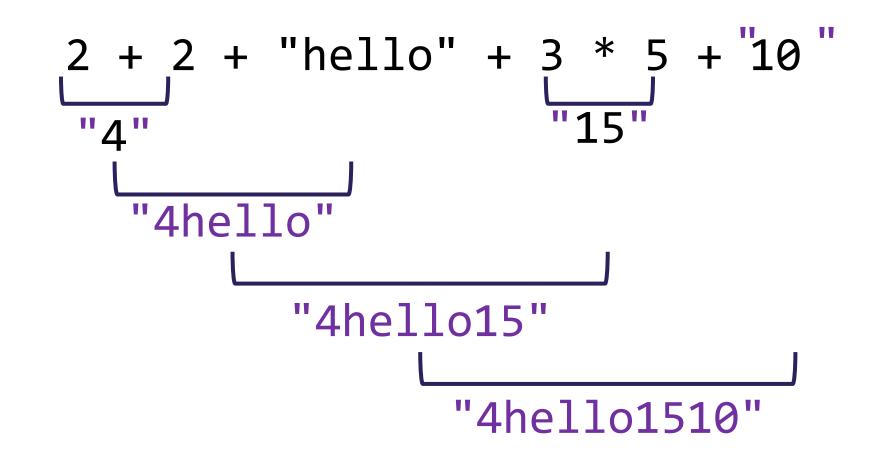
Other conversions are "lossy", because you lose data.

- e.g. to make 3.14 an int, you'd probably pick either 3 or 4 but either one loses data
- Java won't do this automatically for you you need to "ask".
  - called a **type cast**: you'll see this in Friday's PCM + in PO

Some conversions don't make sense.

- how would you convert "Beyoncé" to an int? double?
- Java really doesn't let you do these...

#### **Expression example with mixing types**



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## Work on Expressions and Types Practice (1)

- Ed lesson linked from course calendar
- Work with folks around you!
- TAs & I will walk around and help!

5 *	3 +	1.0
8 /	3 *	2.0
8.0	/ 3	* 2
"Hello"		+ "world"
1 +	"2"	+ 3
1 +	2 +	"3"
1 +	"2"	+ (3 + 4)

### Part 1 Walkthrough

## Work on Expressions and Types Practice (2)

- Ed lesson linked from course calendar
- Work with folks around you!
- TAs & I will walk around and help!

### Part 2 Walkthrough

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## Ed time :)

Applying what we learned to variables!

## What's in a (variable) name or String?

Switch over to Ed and do some experiments (with a partner), then report back on sli.do.

- 1. What types of characters are "allowed" in Strings?
- 2. What types of characters are "allowed" in variable names?



sli.do #cse121

## Food for Thought!

This is the beginning of a very interesting rabbit hole!

(but also, a decision made by the Java designers)

Whether or not you program for a career, you will also make decisions like these!

- for example, what's a "valid name"?
- a theme we'll revisit (and something to continuously reflect on!)

## Announcements, Reminders (again)

- Creative Project 0 due <u>tonight</u> by 11:59 PM
- Programming Assignment 0 releases later today
  - making a receipt generator!
  - due Tuesday, Jan 21<sup>st</sup> at 11:59 PM
  - now on regular "cadence" (Wed release, due following Tue)
- IPL is open! <u>Schedule & instructions on website.</u>
- "Extra resources" tab more practice! (with a caveat)