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
	Merav	Hanna	Zach
	Judy	Maitreyi	
	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 15st 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).

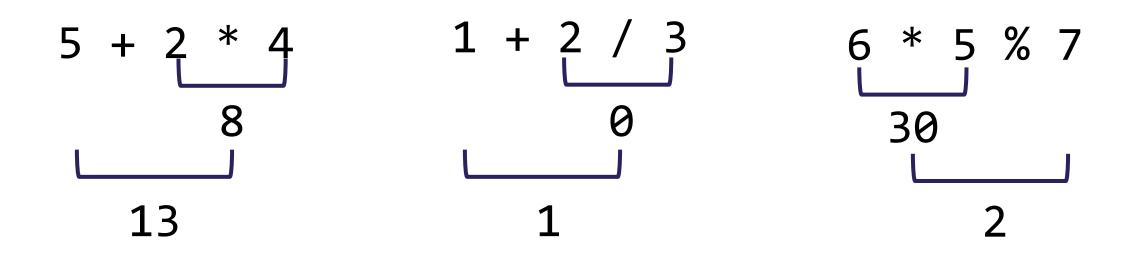
In Math:

- **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!!)

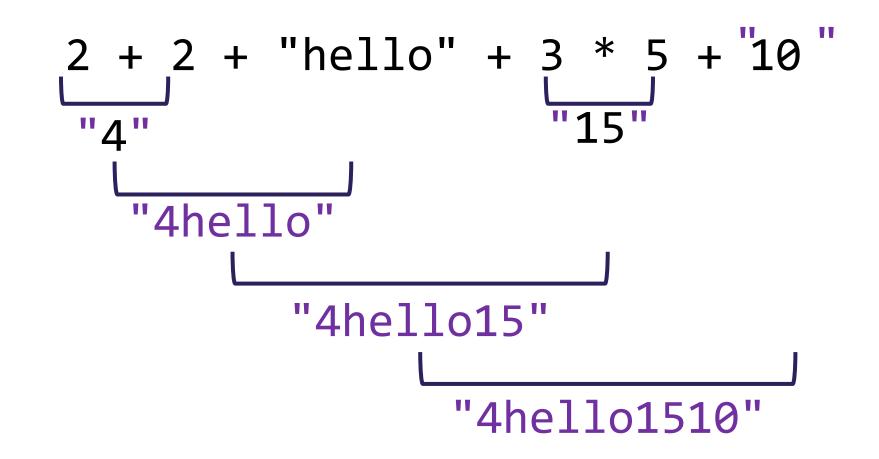
Other conversions are "lossy", because you lose data.

- 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?



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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 21st 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)