LEC 01

CSE 121

Printing, Strings, Variables, Datatypes, and Expressions

Questions during Class?

Raise hand or send here

sli.do #cse121

BEFORE WE START

Talk to your neighbors:

What's your favorite song?

Music: ♣ CSE 121 25su Lecture Tunes ♣

Instructor: Hannah Swoffer

TAs: Abby, Hannah, Julia, Merav, Trey

Agenda

- **Announcements, Reminders** ⟵
- HelloWorld Review
- Printing, Strings, Variables Review
- Variables Example
- Datatypes and Expressions Review
- Expressions Practice
- C0 Overview

Announcements, Reminders

- Check out website for links to all activities & materials
- Creative Project 0 will be out tonight, due Wednesday, July 2nd
- New Ed tool: Sandbox (write all the code you want!)
- First PCM
  - This is much longer than future PCMs will be

Office hours as a resource!

The IPL (TA office hours) will open on Monday (June 30th) at 1:30 PM.

- one of the best parts of the course!
- but, TAs are instructed to not just give you the answer!
  - why not? you wouldn't be learning!
  - e.g. "my code doesn't work" versus
    "I tried X, expected Y, but got Z. Thoughts on what to try next?"
  - also true for Hannah's office hours too ;)

Expect an announcement on Ed with a detailed schedule soon!

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Code Quality

"Programs are meant to be read by humans and only incidentally for computers to execute." –Abelson & Sussman, SICP

Code is about *communication*. Writing code with good **code quality** is important to communicate effectively.

Different organizations have different *standards* for code quality.

- Doesn't mean that any one standard is wrong! (e.g., APA, MLA, Chicago, IEEE, …)
- Consistency is very helpful within a project
- See our Code Quality Guide for the standards we will all use in CSE 121

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PCM: Printing, Strings, Variables

- `System.out.print(…)`
  - Prints the given text to the console
- `System.out.println(…)`
  - Prints the given text to the console, and then moves to the next line
- String literals: a sequence of characters that are *strung* together, begin and end with ""
  - Example: `"hello"`
- Variables allow us to give a name to a specific value
  - 3 parts: declaration, initialization, usage
  - Example:

```
String food = “burrito";
System.out.println(food);
```

Think-Pair-Share Logistics

- CSE 121 will have many think-pair-share activities.

1. **Think** on your own, in silence for about
    1. Vote in sli.do (anonymously)
2. **Pair** with your neighbor about it (and introduce yourself!!)
    1. Vote in sli.do again (anonymously)
3. **Share** in sli.do & in class (I'll typically take a few volunteers)

- Let's practice!

Practice: Think

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How many lines of output would the following code produce?

```
System.out.println("abby");
System.out.print("hannah");
System.out.println("julia");
System.out.println("merav");
System.out.print("trey");
System.out.print("gumball");
```

a) 1

b) 2

c) 3

d) 4

e) 5

f) 6

Practice: Pair

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How many lines of output would the following code produce?

```
System.out.println("abby");
System.out.print("hannah");
System.out.println("julia");
System.out.println("merav");
System.out.print("trey");
System.out.print("gumball");
```

a) 1

b) 2

c) 3

d) 4

e) 5

f) 6

Escape sequences

Escape sequence: a special sequence of characters used to represent certain special characters in a String.

- `\"` to produce " in a String
- `\\` to produce \ in a String
- `\n` to produce a new line character (or line break) in a String
  - note: in our class, we will ask you not to use this
- and many more!

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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!
- All 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).

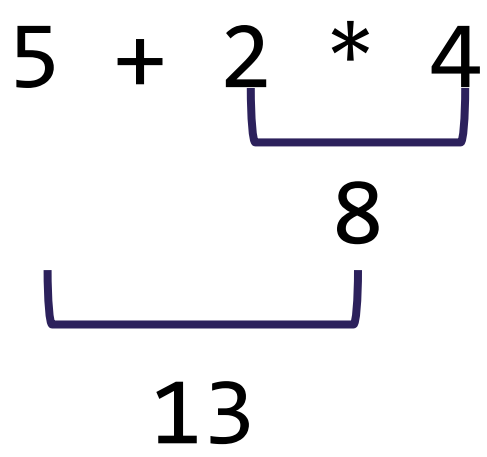
In Math:

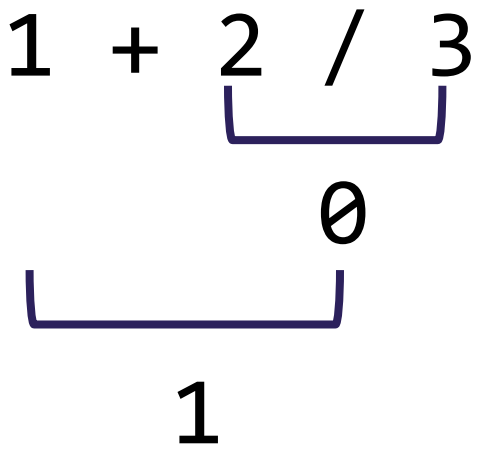
1. **P**arentheses
2. **E**xponent
3. **M**ultiplication
4. **D**ivision
5. **A**ddition
6. **S**ubtraction

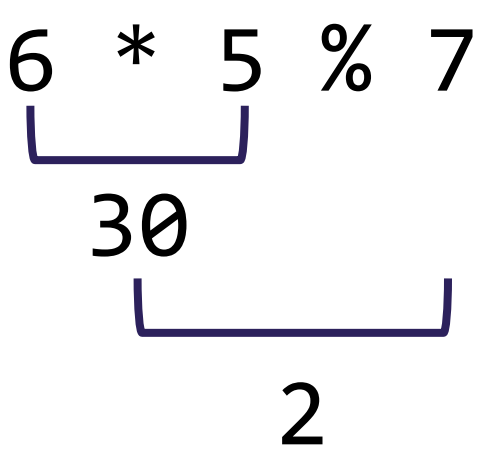
In Java:

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 convert one type to the other and then perform the operation "normally".

Some conversions are straightforward:

- `int`s can be converted to `double`s (add `.0`)
- `int`s and `double`s can be converted to `String`s (add `""`)

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

New: Conversions (Gone Wrong!!)

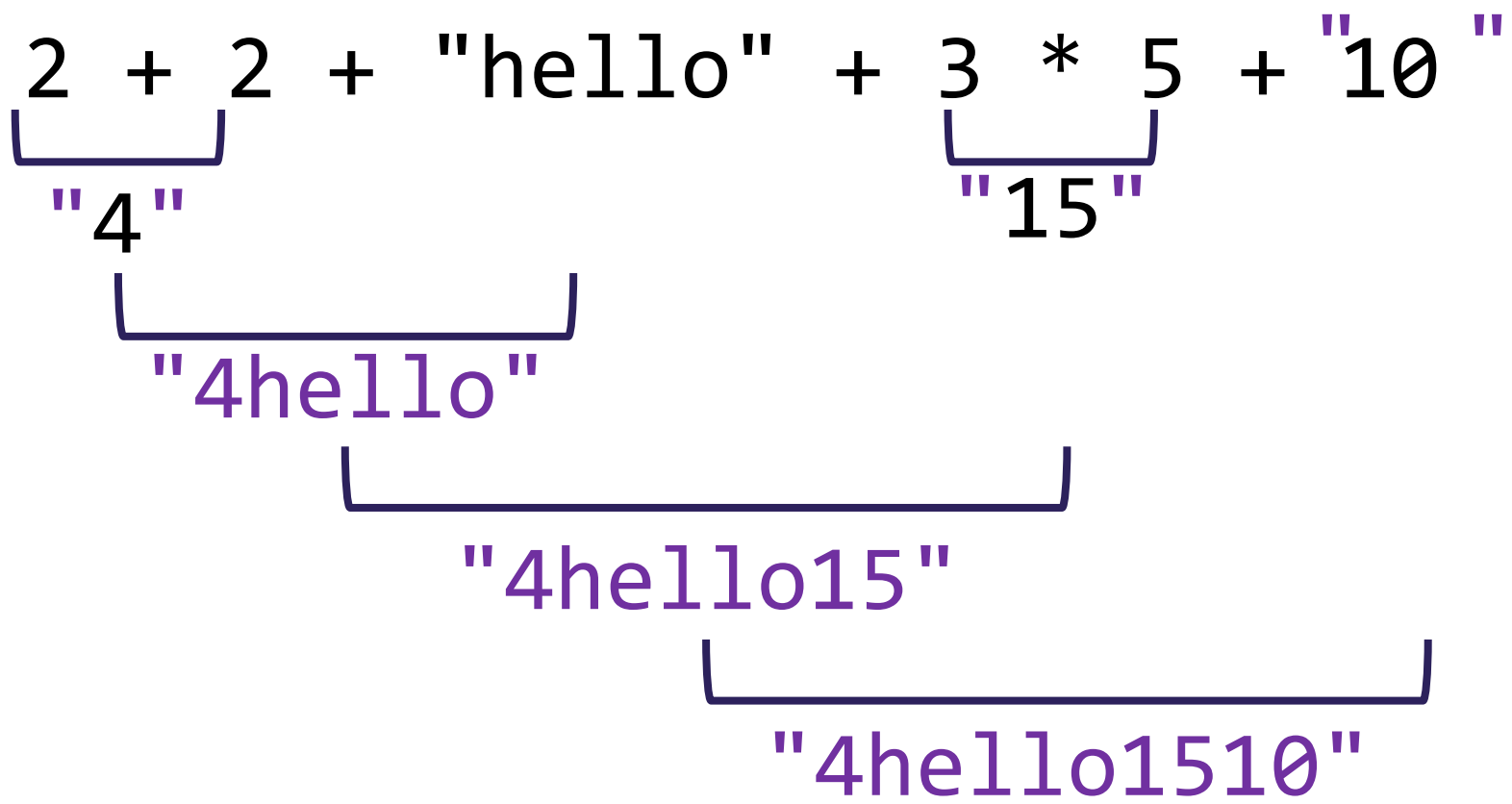
Other conversions are “lossy”, because you lose data.

- 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 P0

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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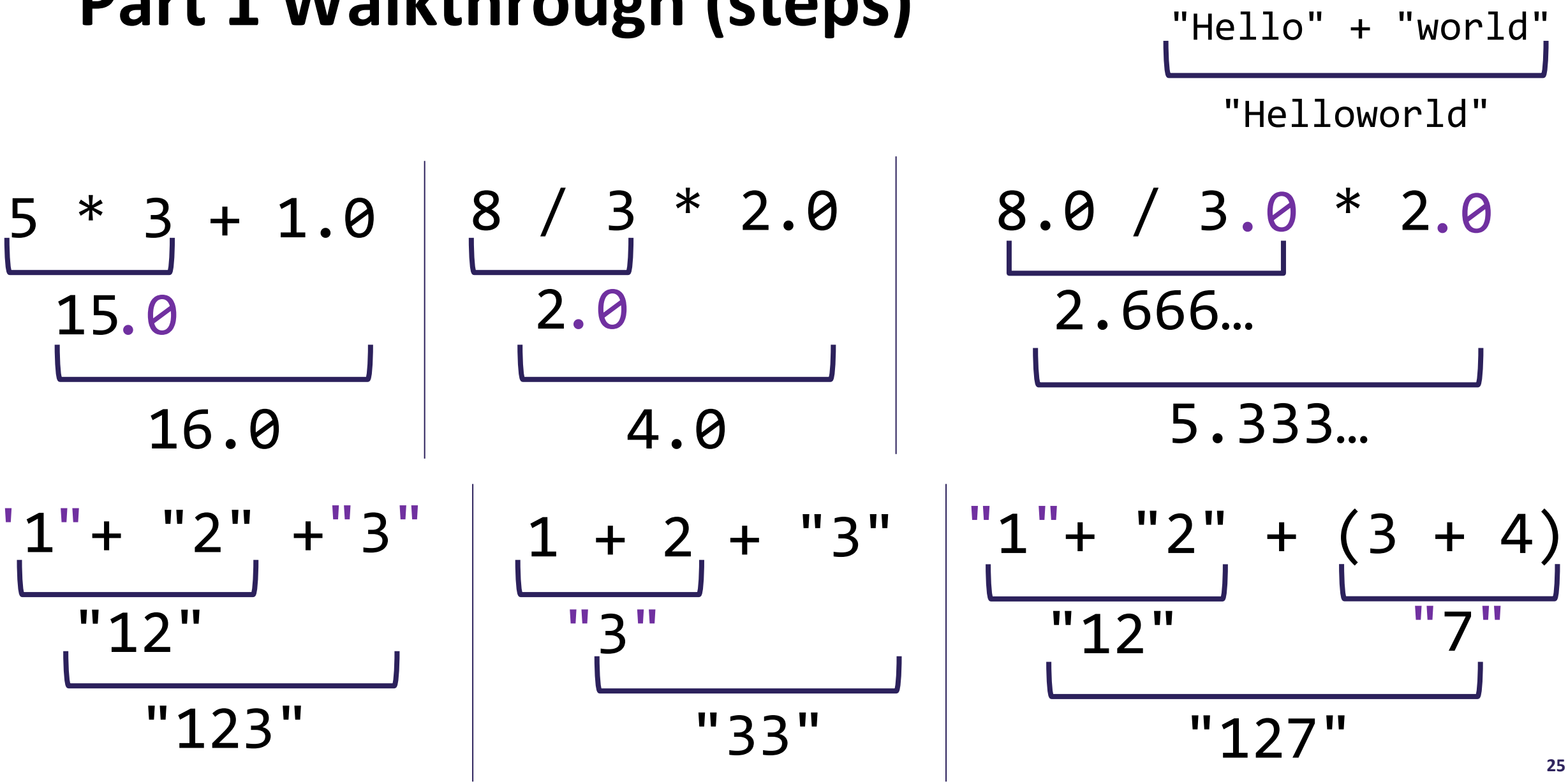
Work on Expressions and Types Practice (1)

- 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

Part 1 Walkthrough (steps)



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Creative Project 0 ("C0"): Hello Bugs?! (1/2)

By release date of assignment, all the relevant content will be covered.

- e.g. C0 is just about printing, strings, and escape characters

Assignments are *partially* about "does your program work", but also:

- tests your ability to read a specification
- is graded on **code quality**
  - ***make sure to take a look at the Code Quality Guide (everything up to class constants)***
- includes a **graded reflection** (don't leave this to the last minute)
  - some metacognition, some societal impact & ethics content

Creative Project 0 ("C0"): Hello Bugs?! (2/2)

This specific assignment…

- has two parts: "Basic Task" and "Creative Extension" (do both!)
- has an optional set of code quality slides (to help you practice)
- intentional gentle onboarding to computer programming
  - **is not meant to be time-consuming or stressful**
  - but also, not representative of all assignments (or programs)

We look forward to seeing your bugs!!