

CSE 121 – Lesson 2

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Spring 2023

Music: [121 23sp Lecture Vibes](#) 



[sli.do #cse121](https://sli.do/#cse121)

TAs:

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Announcements, Reminders

- [Creative Project 0](#) due tomorrow (April 6) @ 11:59 PM
- Programming Assignment 0 released later today (due Tues, April 11)
- IPL is open! - [Schedule and instructions](#) can be found on course website.
- **Just joined CSE 121?** Resubmission policy is your friend! See more in [syllabus](#).
- Reminder: Pre-Class Work and Section work are not graded! (but you should do them anyway 😊)

PCM Recap: Data Types & Expressions

- Types: `int`, `double`, `String`, `boolean`
- Expressions: Operators
- Beware of precedence! (order of operations)

(PCM) Data Types in Java

In programming, you're dealing with data...

- `ints` (whole numbers)
- `doubles` (real numbers)
- `Strings`
- `booleans` (true or false)

(PCM) Operators (for numerical & String values)

Numerical:

- + Addition
- - Subtraction
- * Multiplication
- / Division
- % Modulo or “Mod”

- <, >, <=, >=, ==, !=

Strings

- + Concatenation

Booleans

- ! Logical Not
- && Logical And
- || Logical Or

(PCM) Precedence

Parentheses

Multiplication, **M**odulo, **D**ivision

Addition (and Concatenation), **S**ubtraction

If multiple operators at the same level?

Evaluate subexpressions from left to right!

Example

$$1 + 2 * 3$$

Handwritten work for $1 + 2 * 3$:
A purple bracket underlines $2 * 3$.
Below that, $1 + 6$ is written.
A purple bracket underlines $1 + 6$.
The result 7 is circled in purple.

$$(1 + 2) * 3$$

Handwritten work for $(1 + 2) * 3$:
A purple bracket underlines $(1 + 2)$.
Below that, $3 * 3$ is written.
A purple bracket underlines $3 * 3$.
The result 9 is circled in purple.

Work on Expressions/Types Practice Problems

Part 1

- Ed lesson linked from the course calendar
- Work with the folks around you!
- TAs and I will be walking around to help

Questions?

(PCM) Mixing Types

- When mixing types in an expression, Java will convert one type to the other and then perform the operation “normally”
- ints can be converted to doubles
- Both ints and doubles can be converted to Strings



Example 2

$2 + 2 + \text{"hello"} + \underbrace{3 * 5} + 10$

$\underbrace{2 + 2} + \text{"hello"} + 15 + 10$

$\underbrace{4 + \text{"hello"}} + 15 + 10$

$\underbrace{\text{"4hello"} + 15} + 10$

$\text{"4hello15"} + 10$

$\underbrace{\text{"4hello15"} + 10}$

"4hello1510"

Work on Expressions/Types Practice Problems

Part 2

- Ed lesson linked from the course calendar
- Work with the folks around you!
- TAs and I will be walking around to help

Questions?

(PCM) Boolean Operators

- **!** Logical Not
- **< > <= >=** Relational Operators
- **== !=** Relational Operators (equality)
- **&&** Logical And
- **||** Logical Or

(PCM) Precedence (updated)

Logical not

Parentheses

Multiplication, Modulo, Division

Addition (and Concatenation), Subtraction

Relational operators

Equality operators

Logical and

Logical or

Example 3

$$\begin{aligned} 1 + 2 * 3 & \neq (1 + 2) * 3 \\ 1 + \underbrace{2 * 3} & \neq \underbrace{3} * 3 \\ 1 + 6 & \neq \underbrace{3 * 3} \\ \underbrace{1 + 6} & \neq 9 \\ 7 & \neq 9 \\ \underbrace{\hspace{10em}} & \\ \text{true} & \end{aligned}$$

Work on Expressions/Types Practice Problems

Part 3

- Ed lesson linked from the course calendar
- Work with the folks around you!
- TAs and I will be walking around to help

Questions?

! (1 + 2 == 3 && 10 > 4 > 2)

! (1 + 2 == 3 && 2 > 2)

! (3 == 3 && 2 > 2)

! (3 == 3 && false)

! (true && false)

! (false)

true

Variables

- Now that we know about different types and data, we can learn about how to store it!
- Java allows you to create variables within a program. A variable has
 - A type
 - A name
 - (Potentially) a value it is storing

Declaration: `int x;`
Initialization: `x = 30;`

Or all in one line:

```
int x = 30;
```