CSE 121 – Lesson 2

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Music: 121 23sp Lecture Vibes 🌸

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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 😊)
Recap: Data Types & Expressions

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

Addition (and Concatenation), Subtraction

If multiple operators at the same level?

Evaluate subexpressions from left to right!
Example

\[ 1 + 2 \times 3 \]

\[ \underline{1 + 6} = 7 \]

\[ (1 + 2) \times 3 \]

\[ \underline{3 \times 3} = 9 \]
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

\[ 2 + 2 + \ "hello" + 3 \times 5 + 10 \]

\[ 2 + 2 + \ "hello" + 15 + 10 \]

\[ 4 + \ "hello" + 15 + 10 \]

\[ \ "4\ hello\" + 15 + 10 \]

\[ \ "4\ hello\ 15" + 10 \]

\[ \ "4\ hello\ 15\ 10" \]
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

1 + 2 * 3 != (1 + 2) * 3

1 + 2 * 3 != 3 * 3
1 + 6 != 3 * 3
1 + 6 != 9

7 != 9

true
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?

\[ \neg (1 + 2 = 3 \land \neg 7 > 4 > 2) \]
\[ \neg (1 + 2 = 3 \land 2 > 2) \]
\[ \neg (3 = 3 \land \neg 2 > 2) \]
\[ \neg (3 = 3 \land \text{false}) \]
\[ \neg (\text{true} \land \text{false}) \]
\[ \neg (\text{false}) \]
\[ \text{true} \]
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:  \texttt{int x;}
Initialization:  \texttt{x = 30;}

Or all in one line:
\texttt{int x = 30;}