Lesson 2.02: Booleans & Expressions ## Learning Objectives Students will be able to... * Define and identify: **Boolean, expression, composition, True, False** * Evaluate a Boolean expression * Compose Boolean expressions using `and`, `or`, `not`, `<`, `>`, and `==` ## Materials/Preparation * [Do Now] * [Lab - Can I or Can't I?] ([printable lab document]) ([editable lab document]) * [Associated Readings 2.2] (https://tealsk12.gitbook.io/intro-cs-2/readings#2-2) * Read through the do now, lesson, and lab so that you are familiar with the requirements and can assist students. ## Pacing Guide | **Duration** | **Description** | | ---------- | ---------- | | 5 Minutes | Do Now | | 10 Minutes | Lesson | | 35 Minutes | Lab | | 5 Minutes | Debrief | ## Instructor's Notes ### 1. Do Now * Project the Do Now on the board * Circulate around the class to check that students are working and understand the instructions ### 2. Lesson #### Discussion * After 5 minutes of students working on the Do Now, ask students to recall what a Boolean is and how they used Booleans in Snap! * Ask students what values they saw in part 1 of the Do Now (answer should be `True` or `False`) #### Instruction * **Boolean expression**: is an expression that evaluates to either true or false. * Ask Students about the difference between `=` and `==`. * = is for assignment of value * == builds a Boolean expression and is a way to compare two values * Remind students of Boolean expressions in Snap! ![Snap Boolean Expressions] (snap_Boolean_expressions.png) ![Snap Boolean Expressions =](snap_Boolean_expressions_equals.png) * Ask the students to recall what `and`, `or` and `not` did. * Give students additional time to finish completing part 2 of the Do Now, if needed. * Have a student write up the expression they used to update the `can_get_license` code. * Discuss with students part 3 of the Do Now and how 'or' is used two different ways. #### Poll students - * how many Boolean expressions are used? * Answers here may vary depending on the students' code. #### Instruction Part 2 * Define **composition**: Using an expression as part of a larger expression, or a statement as part of a larger statement. You can use parentheses to compose expressions as well. * Parentheses: In Snap! to compose many expressions they were nested together by simply putting blocks one after another. However, in Python if you want certain things to be evaluated together, use parentheses. ### 3. Lab * Evaluate expressions with `and`, `or`, and `not` * Given written out rules, students will convert them into Boolean expressions. * Create a large expression using variables that describes you. ### 4. Debrief * Check student progress and completion of the lab, wrap up by taking any final questions. ## Accommodation/Differentiation If students are moving quickly, use this opportunity to go over truth tables (or ask them to research De Morgan's Law) ### Convert the following SNAP Truth Table program into Python ![Snap Truth Tables] (Lesson%202.03%20Truth%20Table.png) ## Forum discussion [Lesson 2.02: Booleans & Expressions (TEALS Discourse Account Required)](https://forums.tealsk12.org/c/2nd-semester-unit-2/lesson-2-02-Booleans-expressions) [Do Now]:do_now.md.html [Lab - Can I or Can't I?]:lab.md.html [printable lab document]: https://github.com/TEALSK12/2nd-semester-introduction-to-computer-science/raw/master/units/2_unit/02_lesson/lab.pdf [editable lab document]: https://github.com/TEALSK12/2nd-semester-introduction-to-computer-science/raw/master/units/2_unit/02_lesson/lab.docx