Lesson 2.03: Conditionals ## Learning Objectives Students will be able to... * Define and identify: `if, else, elif, conditionals, flow of control` * Create chaining if statements * Understand how conditional statements alter the flow of control of a program ## Materials/Preparation * [Do Now] * [Lab - Game Show] ([printable lab document]) ([editable lab document]) * Solution (access protected resources by clicking on "Additional Curriculum Materials" on the [TEALS Dashboard]) * [Associated Readings 2.3] (https://tealsk12.gitbook.io/intro-cs-2/readings#2-3) * Read through the do now, lesson, and lab so that you are familiar with the requirements and can assist students * **Microsoft Learn - Conditionals Video** [! [Conditionals Video](https://img.youtube.com/vi/5pPKYWqkoek/0.jpg)](https://www.youtube.com/watch?v=5pPKYWqkoek) * **Microsoft Learn - Handling Multiple Conditionals Video** [![Multiple Conditionals Video](https://img.youtube.com/vi/oYaGJBMoXok/0.jpg)](https://www.youtube.com/watch?v=oYaGJBMoXok) * **Microsoft Learn - Complex Conditions Video** [![Multiple Conditionals Video] (https://img.youtube.com/vi/IBOHc87yFYw/0.jpg)](https://www.youtube.com/watch?v=IBOHc87yFYw) ## 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. * Students should quickly realize that they do not have all the tools necessary to complete the task. ### 2. Lesson #### Instruction * Ask students what they felt like they needed that they had in Snap! * Explain that in order to write useful programs, we almost always need the ability to check conditions and change the behavior of the program accordingly. * **Conditional** statements give us this ability to affect the **flow of control**. * The simplest form is the `if` statement. The Boolean expression after `if` is called the condition. If it is true, then the indented statement gets executed. If not, nothing happens. ```python if x > 0: print("x is positive") ``` #### Take a look at this example ```python animal = input("What is your favorite animal?") if animal == 'cat' or 'dog': print("A great pet!") else: print("Good choice") ``` #### Discussion * Give students time to predict the output for various inputs in the above example. * Discuss why the code is buggy * fix it together as a class. #### Demonstration * Write out the syntax of the `if` statement on the board. Point out the Boolean expression(condition), the colon, and the indentation. * Ask students if they recall what else went along with the if statement when they used it in Snap! * `else` is used when there are two possibilities and the condition determines which one gets executed. * Demonstrate the syntax of `else` * Describe the `elif` statement * Sometimes there are more than two possibilities and we need more than two branches. One way to express a computation like that is a chained conditional: * Demonstrate the syntax of `elif` ### 3. Lab * Students convert the triangle program written in Snap! into Python. * Students must also write a program that simulates a list index using `if` statements. ### 4. Debrief * Check student progress and completion of the lab, wrap up by taking any final questions. * Have students write down a couple of learnings that they stood out to them today in their notebooks. ## Accommodation/Differentiation Use the following as an extension activity for students that are moving quickly: * Convert and finish the following SNAP Vending Machine program in Python. ![Vending Machine](python_2.04_vending_machine.png) If students are moving quickly, this lesson can move onto lists. ## Forums discussion [Lesson 2.03: Conditionals (TEALS Discourse Account Required)] (https://forums.tealsk12.org/c/2nd-semester-unit-2/lesson-2-03-conditionals) [Do Now]:do_now.md.html [Lab - Game Show]:lab.md.html [TEALS Dashboard]:http://www.tealsk12.org/dashboard [printable lab document]: https://github.com/TEALSK12/2nd-semester-introduction-to-computer-science/raw/master/units/2_unit/03_lesson/lab.pdf [editable lab document]: https://github.com/TEALSK12/2nd-semester-introduction-to-computer-science/raw/master/units/2_unit/03_lesson/lab.docx