Lesson 2.04: Lists ## Learning Objectives Students will be able to... * Define and identify: **list, item, index, integer** * Be able to access items from a list using the index * Create lists of different types * Use the length function ## Materials/Preparation * [Do Now] * [Lab - College Chooser] ([printable lab document]) ([editable lab document]) * Solution (access protected resources by clicking on "Additional Curriculum Materials" on the [TEALS Dashboard]) * [Associated Readings 2.4](https://tealsk12.gitbook.io/intro-cs-2/readings#2-4) * Read through the do now, lesson, and lab so that you are familiar with the requirements and can assist students ### **Video Explanation of Lists** [![Video Explanation of Lists] (https://img.youtube.com/vi/wO6lG82RbhM/0.jpg)](https://youtu.be/wO6lG82RbhM?t=67) ## Pacing Guide | **Duration** | **Description** | | ---------- | ---------- | | 5 Minutes | Do Now | | 10 Minutes | Lesson | | 35 Minutes | Lab | | 5 Minutes | Debrief | ## Instructor's Notes ### 1. Do Now * Students follow instructions to create lists and use the `len` function. ### 2. Lesson #### Instruction * Ask students to recall what a list is, and how lists were used in Snap! * A **list** is a sequence of values. In a list, they can be any type. The values in a list are called elements or **items**. * In Python, to create a list you must enclose items in square brackets. * Emphasize that you can have lists of any type (`int, float, string, etc`). You can even have lists within lists (more on that later...) #### Discussion * Ask students what `len` does when they used it in the Do Now. * Ask students how they tried to print the first item from a list. Was this what they were expecting? #### More Instruction * **index**: a map from the position in the list to the element stored there. * **0-index**: lists are 0 indexed. So the first element in the list is at the 0-index * **Out-of-bounds**: what happened when you tried to index into a list that was too long? #### More Discussion * Ask students how they would access the last item in a list of unknown length. (Use the length function!) * Ask students to write on the board how they got the last element of a list. Ask another student to write how they would get the second to last element of the list and so on. #### Demonstration * After accessing any list element you can change it. Take a moment to demonstrate this syntax before starting the lab. ### 3. Lab * Practice accessing and updating items in a list * Implement program from last lab using lists * Create a quiz program ### 4. Debrief * Check student progress and completion of the lab, wrap up by taking any final questions. ## Accommodation/Differentiation If students are moving quickly, you can introduce the topic of nested lists. Start off with a simple nested list like `['a', 'b', 'c', [1, 2, 3]]`. Ask the students to guess the length. Ask the students to guess how they would access the item '1' from that list! ## Forum discussion [Lesson 2.04: Lists (TEALS Discourse Account Required)](https://forums.tealsk12.org/c/2nd-semester-unit-2/lesson-2-04-lists) [Do Now]: do_now.md.html [Lab - College Chooser]: 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/04_lesson/lab.pdf [editable lab document]: https://github.com/TEALSK12/2nd-semester-introduction-to-computer-science/raw/master/units/2_unit/04_lesson/lab.docx