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Unit Plan: Introduction to Python

Topic of the Lesson: Conditionals (part 1)

Grade and Content: 10th - 12th / CSP

Date: Fall 2022

Learning Objectives:

- Students will learn to evaluate boolean expressions.
- Students will learn the logical operators in Python.
- Students will learn to write simple conditional statements in Python.

NYS standards:

- **9-12.CT.9:** Systematically test and refine programs using a range of test cases, based on anticipating common errors and user behavior.

Content-specific vocabulary:

- Boolean expression
- Logical operator
- Conditional statement
- Comparison operator

Materials/Resources:

- Computers
- Smartboard
- Slides
- Python
- Replit
- Lab
- Textbook: <https://books.trinket.io/pfe/index.html>
- Simon says game
<https://minecraft.makecode.com/courses/csintro/conditionals/unplugged>

Assessments:

- Programming log
- Lab completion

Warm-up (5 minutes):

- Students will play a variation on the “Simon says” game to practice conditionals.
- Students will stand up.
- The teacher will say a series of conditional statements – some may just be If..., but some may be If... Else...

Examples:

- IF your name starts with a ‘J’, give me a thumbs up
- IF the month of your birthday ends with a ‘Y’ or an ‘R’, raise both your arms
- IF you play soccer, kick your feet (be careful not to kick anyone)
- IF your favorite ice cream flavor is chocolate, stick out your tongue, ELSE make rabbit ears behind your head
- IF you play a musical instrument, snap your fingers, ELSE whistle

Activity / Sequence of Lesson (20 minutes lesson, 15 minutes lab):

- The teacher will explain that boolean expressions are either true or false.
- The teacher will show boolean expressions examples using different comparison operators (live coding).

Examples:

`x == y, x != y, x > y, x < y, x >= y, x <= y, x is y, x is not y`

- The teacher will explain the logical operator in Python: and, or, not.
- The teacher will demonstrate the use of logical operators:
`x > 0 and x < 10`
`n%2 == 0 or n%3 == 0`
`x != y`
- The teacher will demonstrate how to write a simple if statement in Python.
`if x > 0 :`
`print('x is positive')`
- The teacher will demonstrate how to write two possibilities and the condition determines which one gets executed in Python.
`if x%2 == 0 :`
`print('x is even')`
`else :`
`print('x is odd')`

- The teacher will ask students to work with a partner (pair programming) on the “02_LAB_Conditionals_1”.
- The teacher will walk around the classroom to observe students’ performance and assist with questions or problems about the lab.

Summary / Next Steps / Exit Slip (5 minutes):

- The teacher will ask students to complete their lab as homework if they still need to finish it.
- The teacher will ask students to complete their “Log Programming”.