TASK

True or False? The Boolean Data Type

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Introduction

Welcome to The Boolean Data Type Task!

Booleans are a very interesting data type as, unlike many of the other data types, they can only store two values, namely *True* or *False*. Learning about the boolean data type is very important as it enables you to use and have a better understanding of conditional statements. This task will introduce you to booleans and give you a better understanding of how to use this unique data type.

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What are Booleans

Booleans were developed by an English mathematician and computer pioneer named George Boole (1815-1864). A boolean data type can only store one of two values, namely *True* or *False*. One byte is reserved for the boolean data type.

Use booleans when checking if one of two outcomes is *True*. For example: is the car insured? Is the password correct? Is the person lying? Do you love me?

Once the information is stored in a variable, it is easy to use *loops* and *if statements* to check an extensive sample of items and base your calculations on the result of a boolean value.

Assigning Boolean Variables

Assigning a boolean variable is very simple. You declare the variable name and then choose its starting value. This value can then be changed as the program runs.

For example:

```
pass_word = False
pass_word = True
```

Booleans in Control Statements

Control statements allow you to use booleans to their full potential. As of now we only know how to declare a boolean variable as either *True* or *False*, but how would this benefit us? How would we use it? This is where the *if statement* comes into play. Let's look at a simple decision we might make in our everyday lives.

When you are about to leave your house, do you always take an umbrella? No, you would only take an umbrella if it is raining outside. This is a very rudimentary example of decision making where there are only two outcomes. We can apply these basic principles to create more complex programs.

```
umbrella = "Leave me at home"
rain = False

if rain:
  umbrella = "Bring me with"
```

Instructions

Before you get started, we strongly suggest you start using Notepad++ or IDLE to open all text files (.txt) and python files (.py). Do not use the normal Windows notepad as it will be much harder to read.

First, read **example.py**, open it using Notepad++ (Right-click the file and select 'Edit with IDLE).

- **example.py** should help you understand some simple Python. Every task will have example code to help you get started. Make sure you read all of **example.py** and try your best to understand.

- You may run **example.py** to see the output. Feel free to write and run your own example code before doing the Task to become more comfortable with Python.

Compulsory Task

Create a Python file called **password.py** in this folder.

One of the most important patterns in computers and on the internet is your password. For a password to be classified as "Strong" the password needs to be structured in a certain way. Password Strength is determined by:

  - The length of the password (at least 6 characters) (*have_length*)
  - Needs to contain uppercase letters (*up_case*)
  - Needs to contain lowercase letters (*low_case*)
  - Needs to contain numbers (*have_num*)

- Declare boolean variables for each one of these characteristics.
- You will find the name of the variable next to the condition in the list above. Each variable must be initialised as *False*.
- Then ask the user a series of "yes or no" questions for each variable, change the boolean variable to *True* based on their answer.
- Once 3 of the characteristics are met (3 of the variables == *True*) then display a message saying this is a suitable password.

Optional Bonus Task

- Create a Python file called **optional_task.py** in this folder.
- This program will help the user decide what to wear. To determine what to wear, you need to determine whether the temperature is greater than 20 degrees, whether it is the weekend, and whether it is sunny. Declare boolean variables for each one of these characteristics.
- Then, ask the user a series of "yes or no" questions for each variable, and change the boolean variable to *True* or *False* based on their answer.
- If the temperature is greater than 20 degrees, then the user should wear a short-sleeved shirt.
- If the temperature is less than 20 degrees, then the user should wear a long-sleeved shirt.
- If it is the weekend, the user should wear shorts.
- If it is a weekday, the user should wear jeans.
- If it is sunny, the user should wear a cap.
- If it is not sunny, the user should wear a raincoat.
- Display a sentence that fully describes what the user's outfit should be.

Thing(s) to look out for:

1. Make sure that you have installed and setup all programs correctly. You have setup **Dropbox** correctly if you are reading this, but **Python or Notepad++** may not be installed correctly.
2. If you are not using Windows, please ask your mentor for alternative instructions.

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