Lab 2
Logic, Loops and Control

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September 19, 2022

Goals

The goal of this lab is to practice using Python 3. Specifically, you will practice:

- Review of Input, Output, and Casting
- Boolean Logic
- Control Flow
- Loops

Instructions

All work is due at the **end of your lab** and must be submitted to Brightspace in the proper place. Unless otherwise instructed, submissions must be python files (e.g. files that end with *.py*). Any other format, even if it is plain text, will **not** be graded. Messy or otherwise unreadable code will lose points. Lab submissions can be all in the same file, but please label with comments to which task code belongs. IMPORTANT: Any code that is commented out will not be graded. **RUN YOUR CODE TO MAKE SURE IT WORKS!!!**

Task 1 - Review

Convert the following to Python code.

1. What is the result of the following casts (assuming they were printed). If the result is a floating point number, make sure you show the decimal place even if it is followed by zeros. Put your answer in a comment:
   (a) int(5.999)
   (b) float(1//2)
   (c) int(1.2) - int(True)
   (d) float(str(1.5))
   (e) float(7+bool(7.2))

Task 2 - if-elif-else Blocks

Write Python code to solve each of these subtasks. You will need to use if-elif-else blocks and other tools. You will need to declare and define the variables for each sub-task.

1. Write an if-block that test whether x is greater than 1. If it is greater than 1, it should be set to 1.

2. Extend the previous if-block with an else-if so that if x is less than -1, it sets x to -1.
3. Extend the previous block again with an else so that if x is between -1 and 1, it sets x to 0.
4. Print *Yes* if the value of y is greater than 10 and less than 20. Else print *No*.
5. Print *Correct* if the value of a is equal to b or if a is equal to c. Print *Incorrect* otherwise.
6. The variable t contains a floating point number. If the part of the number to the right of the decimal is equal to zero, then cast t to an integer. Otherwise, leave it alone. For example, 5.0 should be cast to an int. Whereas, 5.001 should not.
7. Write an if-elif-else block which will print *True* if **only one** of the three variables, i, j, or k is not equal to zero. Otherwise print False. You may use as many ifs, elifs and elses as you need.

Task 3 - While Loops

Convert the following to Python code.

1. Write a *while* loop that prints the numbers from 10 to 1 inclusive in descending order. Each iteration of the while loop should only print one number.
2. Now repeat the previous problem, but print them in ascending order.
3. Write a *while* loop that repeatedly asks the user for a single character. If the user types a lowercase q, the loop quits.
4. Write a *while* loop that sums all the odd numbers between 1 and 1000 (inclusive). Print the sum once the loop ends.

Task 4 - Reading Code

Please state in a comment which messages will be printed for the following sections of code. It may print more than one message. First, read the code and try without the use of the Python interpreter to come up with an answer. Once you have an answer, put the code into a .py file and run it to verify your answers.

A

```
cash = 1.5
if int(cash)*2.0 != int(cash*2.0):
    print("The devil is in the details.")
```

B

```
temp = 40
if temp < 40:
    print("It is cold.")
elif temp < 70:
    print("It is mild.")
elif temp < 90:
    print("It is hot.")
else:
    print("It is unbearable.")
```

C

I wrote the following code to add all the numbers from 1 and 10. The correct result is 55; however, this code does not work. Identify what is wrong and suggest a corrected version. When correcting the code, try to correct the existing code rather than completely rewrite a new solution.

```
i = 1
while i != 10:
    i = i + 1
    total = total + i
print(total)
```

Task 5 - Extra Practice

You now know how to use variables, print output, ask for input, repeat sections of code and branch using if-else statements. Together, these are sufficient tools to make a simple text-based game. Write a simple text game that presents the player with a scenario (e.g. You are in a dark wood). It then gives the player a choice of options and based on their choice, presents the player with either another scenario or an end.