DS2000 -- Fall 2024 -- Practice Exam

This practice exam contains some sample questions on the same topics that will appear on Mini-Exam #1. Please complete the questions on your own, and we'll publish the solutions on Piazza

Mini-Exam #1 takes place on October 4th 2024. It will be administered on paper, during our usual lecture time.

The exam is designed to be approximately 30 minutes long, but you may use the entire class time to complete it. Don't rush, take your time with each question, and double-check your solutions before handing it in.

For the exam, you may bring one 8.5x11-inch piece of paper, with anything written or typed on it (one side only). You will submit this cheat sheet along with your exam, and you will not be permitted to use any other materials or notes during the exam.

Part One -- Variables, Arithmetic, and Communication

1A Which of the following Python statements would you use to prompt the user for the number of dogs they have? Select the best answer.

(A) `input("How many dogs do you have?\n") = num_dogs`

(B) `num_dogs = int(input("How many dogs do you have?\n"))`

(C) `print("How many dogs do you have?")`

(D) `num_dogs = input("How many dogs do you have?\n")`

1B What do the following expressions evaluate to in Python?

`101 / 2`

Solution: 50.5

`2 ** 2`

Solution: 4

`101 % 2`

Solution: 1

`101 // 2`

Solution: 50

1C Write a snippet of Python code that prompts the user for two floats and prints out the larger value to the user. No need to include a def main(), comments, or anything similar -- just the snippet requested.

Solution:

```
x = float(input("Enter a number\n"))
y = float(input("Enter another number\n"))
print("The maximum is", max(x, y))
```

Part Two -- Files and Data Viz

2A We sometimes store filenames in variables that are constants (labels in ALL_CAPS). Why do we do this? Circle all that apply

(A) To indicate its value will not change once initialized

(B) Because filenames are strings; we wouldn't use constants for ints or floats

(C) To keep important values in one place, so that if we need to change them we only need to do it once

(D) Python requires us to use constants for filenames

(E) To indicate we won't change the contents of the file

2B Assuming you have a file named "filee.txt" that looks like this:

```
2
4
6
8
```

What would the code snippet below print?

```
with open("file.txt", "r") as infile:
    for line in infile:
        val = int(line)
        print(val * 2)
```

Solution: `4, 8, 12, 16`

2C Write a snippet of Python code that opens a file named "file.txt" that contains one integer value per line, and plots each value as a *y* value with the file's corresponding row number as the *x* value. (You can assume that matplotlib has already been installed and imported, and you can choose any symbol/shape to plot that you like!)

Solution:

```
ctr = 1
with open("file.txt", "r") as infile:
      for line in infile:
            y = int(line)
            plt.plot(ctr, y, "x")
            ctr = ctr + 1
```

Part Three -- Conditionals

3A If you have three code blocks, and you want to guarantee that *exactly one* of them will execute, which conditional structure would you use?

(A) `if/if/if`

(B) `if/elif/else`

(C) `if/elif/elif`

(D) `if/else/else`

3B What does the code below print to the terminal?

```
x = 3
y = 4
if x < y:
  print("hello!")
elif x < 10:
  print("hi :)")
```

```
hello!
```

3C Write a Python snippet that prompts the user for 20 integers. For each number, if it is greater than 100, add it to the list initialized in the starter code. No need to include a def main(), comments, or anything similar -- just the snippet requested.

```
big = []

for i in range(20):
      num = int(input("enter a number\n"))
      if num > 100:
            big.append(num)
```