CPE 101: Fundamental of Computer Science I

(LAB-9)

Due: 3/11/2022

For this lab you will explore sort and exception.

For sort algorithms no need for code, just show step by step what will be the list using each algorithm.

Insertion Sort

For the following list apply the insertion sort algorithm manually.

L = [12, -2, 34, -98, -4, 0, -23, 12, 32, 13]

How many steps do you have? Show all the steps to sort the list L.

Selection Sort

For the following list apply the selection sort algorithm manually.

L = [12, -2, 34, -98, -4, 0, -23, 12, 32, 13]

How many steps do you have? Show all the steps to sort the list L.

File I/O and Exceptions (decompose your program – use different functions)

Create a file **count_types.py** Next your program should attempt to open the given input file for reading. Opening the file could fail for several reasons (e.g. the given file doesn't exist, the given file doesn't have the needed permissions, etc.) Failure to open the file could result in an exception being raised. This will cause your program to crash!

Your code will try something. If that something works, then great ... continue on. If that something does not work, then "catch" the exception and so something else. You can think of this as asking for forgiveness instead of asking for permission. The code outline below gives the simple structure of working with operations that may raise exceptions.

```
try:
  # what you want to attempt to do
except:
  # what to do if the previous code raises an exception
```

Should opening the file raise an exception, print the message 'Unable to open [filename]' and quit your program using exit. Replace [filename] with the name of the actual file. (Alternatively, if you know how, you may print the message in the Exception that was raised.)

Your program should open the file and read each line. The file will consist of integers, floats, and "other" strings that are not ints or floats. You should keep a count of each kind of thing read from the file and print the results when you are finished reading the entire file. For example, given the following input file:

```
abc123  34
2.34  h
3333333
2
```

Your program should output:

```
Ints: 3
Floats: 1
Other: 2
```

Some Hints

How do you figure out if a 'word' in the file is an integer, a float, or something else? Some helpful hints:

- Don't forget you can split each line into words.
- A word that consists of all digits is an integer. Test for that first. Remember the string function isdigit. For example: s = ['this', 'is', 'a', 'test', '12']
  s[4].isdigit() will returns True
  - Attempting to use the float function (casting to float) on something that *is* a float will succeed. **Attempting to use it on something that isn't a float will fail (i.e. raise an Exception).**

Submission

Submit your files in Canvas.

Sort:

1) Insertion 10 Pts.
2) Selection 10 Pts.

inFile

3) # of ints 10 Pts.
4) # of floats 5 Pts.
5) # of others 5 Pts.

Exceptions:

6) Handle exception 20 Pts.

Test with another file 30 Pts