CMPT 120—LAB WEEK 6 (Feb. 17)

In Lectures 12 and 13, you were given some common usages for variables in loops.

GOALS OF THIS LAB:

- Understand how to use a function defined by somebody else.
- Recap the various standard usages for variables in a loop.

General instructions:

- It is recommended you do these exercises in teams of 2 people each. Make sure to take a partner that has roughly the same experience and understand of the topic as you. (If you team up with someone who comprehends the material much better than you, then chances are you will not learn anything.)

- Save your work for future reference and to show the TAs and instructor, so as to show you have actively participated in the lab.

- **Save your files in your home folder U:** (files saved on the Desktop may get lost). Python files should have the **.py** extension written explicitly—the *extension* is the end of filename.

Submission of this lab:

- This week, submission will be done through Coursys, which is available https://courses.cs.sfu.ca/ and it is only due on **Monday Feb. 17th**.

- You are asked to submit one Python source code for your entire lab, which means exactly two things:

  1. You should work almost entirely inside an IDLE code window (instead of the IDLE shell).

  2. You should add comments to your code to separate questions, and mark observations or textual answers (answers which are not code).

EXERCISE: people wearing glasses
This exercise is a direct application of the two lectures.

You need to write a source file, which begins with the following code, which you may also download from the course website.

```
import random

# 20% of students wear glasses

glasses_prob = 0.20

# Function "glasses"
#
# Takes: the position of a student in a class
# Returns: a Boolean value
#             - True if the student wears glasses
#             - False if not

# ----------------------------------------------------------
# IMPORTANT NOTE: this is *complicated* function beyond
# the scope of the class; do not try to understand it, or
# remember how it is written.
# ----------------------------------------------------------

def glasses(pos):
  global students
  if not "students" in globals():
    students = [None]*200
  if pos < 0 or pos >= len(students):
    students = students + [None]*(pos - len(students)+1)
  if students[pos] == None:
    students[pos] = (random.randint(1,100)
                     <= int(round(glasses_prob*100)))
  return students[pos]
```

Listing 1: the initial code provided for the lab

Using the function `glasses(pos)` which returns whether student in position `pos` is wearing glasses, answer the following questions:

1. Write a function `number_of_glasses_in_range(first, last)` that counts how many students are wearing glasses in the range that begins with student in position `first` and ends with the student in position `last`.

2. Write a function `first_student_wearing_glasses(first, last)` that returns the position of the first student wearing glasses in the

range that begins with student in position `first` and ends with the student in position `last`.

3. Write a function `neighbors_with_glasses(first, last)` which returns `True` if there are two students with consecutive positions (in the range that begins with student in position `first` and ends with the student in position `last`) that are wearing glasses, and `False` otherwise.