CIS 210, Fall 2016
Introduction to Computer Science

Main Menu

- Class home page
- Piazza
- How to Succeed
- Schedule
- Assignments
- References
- Exams

Project 3, Part 2

This assignment is due Friday, October 14 at 5pm. Save your Python program in a file called draw_barcode.py and turn that file in using Canvas.

Purpose

More practice turtle graphics. Nested for loops, lists of lists.

Create a turtle graphics function to plot a barcode for a ZIP code

A ZIP Code (or a ZIP+4 code) is required for all material delivered by the US Postal Service. For direct mailing by companies, a reduced postage charge is made if the company supplies a barcode for the ZIP Code in addition to its numeric representation.

Each digit of the barcode is represented by 5 bars, some half-height, others full-height. Each barcode starts and ends with a full-height bar (often called a guard rail or frame bar). Between the frame bars, the representation of the digits that make up the zip code (from high order digit to low order digit) are printed, followed by the the representation of a check digit. The check digit algorithm is described further below.

The following table shows the correspondence between digits and guard rails and barcodes. Also shown is the defined binary representation for the barcodes.

Digit	7 4 2 1 0	Barcode
0	1 1 0 0 0	
1	0 0 0 1 1	
2	0 0 1 0 1	
3	0 0 1 1 0	
4	0 1 0 0 1	
5	0 1 0 1 0	
6	0 1 1 0 0	
7	1 0 0 0 1	
8	1 0 0 1 0	
9	1 0 1 0 0	
Start/Stop	1	

Checkdigit algorithm

The check digit is chosen so that the sum of all the digits in the zip code is a multiple of 10.

To calculate the check digit:

- Add up the digits. For example, the zip code for the U of O is 97403; the sum of these digits is 23.
- Find the remainder when the sum is divided by 10; this is sum % 10; in our example, this is 3.
- Subtract this remainder from 10. For our example, this difference is 7. The check digit is 7. *Note that if the remainder is 0, the check digit is 0.*

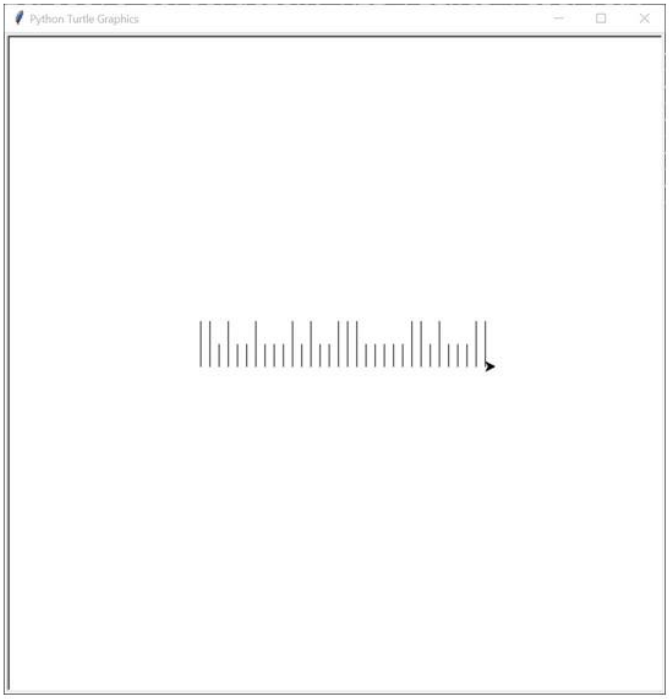
Requirements

You will create a Python program to use Turtle graphics to draw the barcode corresponding to a 5-digit zip code.

```
# draw the barcode for 97403

$ python3 draw_barcode.py 97403
```

Your barcode should look like the following image:



Getting started

This starter code may be helpful.

Grading

35 points possible

- 15: Program runs and produces the correct output. 5 points if it produces barcode output that is not correct.
- 10: Follows CIS 210 coding guidelines, including author identification and header .
- 10: Clarity. The program should not only be consistent with the requirements and approach described here, but it should be very easy to read the program and verify its consistency with the spec.