**Course 12-746**
**Python Prototyping for Infrastructure Systems**

**Fall 2016**
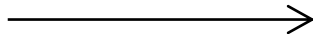
**Assignment 5 (Total: 8 points)**

**Due: Friday, Oct. 11ᵗʰ, by Blackboard by end of the day.** For each day the assignment is late, a penalty of 10% of your total grade will be deducted.

**Task 1 (4 point)** *Drawing annotations*

In the lecture 7, we discussed how to use the canvas widget in tkinter to show a drawing image and add annotation to the drawing. Please use the example files from class (DrawingManagementSystem.zip) and implement the following annotation functions:

  a. Please write code in method DrawCircle in the DrawingCanvas.py module. This method is similar to the example DrawRectangle we discussed in class. The first click from user defines the center of the circle, and the second click from user defines the radius. (1 point)

  b. Please write code in method DrawArrow in the DrawingCanvas.py module. This method is similar to the example DrawLine we discussed in class. But instead of drawing a single line, this method will add an arrow at the end of the line. You can decide the size and angle of the arrow, as long as it is similar with the example below. (2 point)
  Hint: The arrow end is just two additional short lines. Think about how to calculate the coordinates of the two short lines and draw them when user clicks. **Do not** use the line style from the tkinter library to directly draw a line with the arrowhead



  c. Please write code in method ChangeAnnotationColor in the DrawingCanvas.py module. This method will do the following steps: (1 point)
    1. Open a dialog to ask user to choose a color.
    2. Assign this color to the attribute globalAnnotationColor of DrawingCanvas class.
    Please test by yourself to make sure that after user chooses a new color, any new annotation added to the canvas will use this new color.

**Task 2 (4 point)** *Database management*

In the lecture 6, we have discussed how to use Python to access MySQL database. Please create a schema **using this format 12746_your Andrew ID (e.g., for Pine the schema name is 12746_xuesongl)** with the following table "*books*" **in your own schema**. Only create the schema and table. Don't write the records to it yet.

| ID (INT) (Primary key) | Title (VARCHAR(200)) | Author (VARCHAR(50)) | Price (FLOAT) | Quantity (INT) |
|---|---|---|---|---|
| 1001 | Learning Python, 5th Edition | Mark Lutz | 40.89 | 31 |
| 1002 | Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython | Wes McKinney | 25.24 | 10 |
| 1003 | Python Cookbook | David Beazley, Brian K. Jones | 31.80 | 100 |

    a. Please write the Python code to add the records to the database; (1 point)

    b. Please write the Python code to use the SELECT statement to get the Title, Quantity and Author of the records that have price less than 50. Sort the results using the column Price ascending. (1 point)

    c. For the records that have Price less than 50, please write the Python code to use UPDATE statement to modify the value in the Quantity column to 9. (1 point)

    d. Please write the Python code to delete the records that have price less than 50. (1 point)