Learning Objectives

* Create reproducible data visualizations
* Write and execute computer code to automate difficult and repetitive data related

tasks

* Manipulate data and transform it across file systems, flat files, databases,

programming languages, etc.

Computer and Data Requirements

* Data required for this assignment are the Logan River ODM database in MySQL that you created in Assignment 5.
* You may use any Python IDE or execution environment. However, PyCharm Community Edition with Python 2.7 is recommended. You will need at least Python along with the PyMySQL and matplotlib packages. PyCharm may be obtained from the JetBrains web site: [https://www.jetbrains.com/pycharm/download/ (Links to an external site.)](https://www.jetbrains.com/pycharm/download/).

Task

Explore the data stored in the Logan River ODM using SQL statements executed through Python. Specifically write code to answer the following questions using Python and MySQL:

1. Question 1: How many temperature observations are there in the Logan River ODM database?
2. Question 2: What Percent of the Temperature Data in LoganRiverODM are Null?
3. Question 3: What percent of the (non-null) temperature observations are > 20 degrees?
4. Question 4: What is the average temperature at midnight? (hint, the return type for a date retrieved from pymysql is also a date type. So you can use functions like, "myvalue.year" to get an integer representation of the year.
5. Question 5: Make a graph of the data (not including null values) using matplotlib. My code shows a very simple graph using matplotlib. Your graph should include a date on the x axis, a y axis label and an appropriate title. You can find examples here [http://matplotlib.org/gallery.html (Links to an external site.)](http://matplotlib.org/gallery.html).

Deliverable

1) A one-page write up summarizing your work. Indicate where you got your code and what challenges if any you encountered. In your write up include the answers to the questions 1-6 above and your final graph.

2) Your Python code for each problem.