**I-590 Data Science in Drug Discovery Health and Translational Medicine**

**Assignment 1 (due Week 4 – January 30, 2016)**

The purpose of this assignment is to provide a basis for the other sections of the course and to provide an opportunity for you obtain experience with Tableau, a widely used visualization tool. If you are already familiar with Tableau, then you can skip the tutorials and go straight to the assignment. If Tableau is new to you, then this is your opportunity to learn it.

If you have not yet received your Tableau Product Key, then download and install a trial version of Tableau Desktop from Tableau website. The trial version valid for 14 days, which will give us time to get you the Product Key if it isn’t available at the start of the course.

# Learning Objectives

# After completing this assignment, students will demonstrate an ability to:

* Articulate best practices in data visualization
* Develop and interpret a wide range of charts and graphs in Tableau
* Enhance and customize visualizations as needed for a specific context
* Visualize and interpret spatial data
* Verbally communicate persuasive, data-driven insights supported by Tableau visualizations

Assignment:

# For those new to Tableau

**Step 1. Download and Install Tableau (required)**

Go to <http://www.tableau.com/products/desktop> click on “TRY IT FOR FREE”, register, download and install it in on your machine.

2. Expand the “Getting Started” section and watch three videos that teach you about connecting with data, data preparation, building views, filters, dashboards, story points and ways to distribute.

**Training videos**: <http://www.tableau.com/learn/training>

**Tutorial guide here**:

<http://onlinehelp.tableau.com/current/guides/get-started-tutorial/en-us/get-started-tutorial-home.html>

Getting Started (3 videos, 34 minutes)

1. [Getting Started](http://www.tableau.com/learn/training?qt-training_tabs=1" \l "qt-training_tabs" \t "_blank)
2. [The Tableau Interface](http://www.tableau.com/learn/training?qt-training_tabs=1" \l "qt-training_tabs" \t "_blank)
3. [Distribution and Publishing](http://www.tableau.com/learn/training?qt-training_tabs=1" \l "qt-training_tabs" \t "_blank)

This is a good time to read these time saving tips: <https://sqlbelle.com/2014/09/12/tableau-desktop-timesaving-tips/>

| STEPS  [Step 1: Connect to your data](http://onlinehelp.tableau.com/current/guides/get-started-tutorial/en-us/get-started-tutorial-connect.html)  Learn all about the Start page and how to connect to your data.  [Step 2: Drag and drop to take a first look](http://onlinehelp.tableau.com/current/guides/get-started-tutorial/en-us/get-started-tutorial-drag.html)  Get to know the Tableau workspace, learn the language of Tableau, and start examining your data.  [Step 3: Focus your results](http://onlinehelp.tableau.com/current/guides/get-started-tutorial/en-us/get-started-tutorial-focus.html)  Ask deeper questions and use additional tools to refine your views and gain insights about your data.  [Step 4: Explore your data geographically](http://onlinehelp.tableau.com/current/guides/get-started-tutorial/en-us/get-started-tutorial-explore.html)  Learn how to plot your data on a map to see if you can spot any trends.  [Step 5: Drill down into the details](http://onlinehelp.tableau.com/current/guides/get-started-tutorial/en-us/get-started-tutorial-drilldown.html)  Drill down into the details of your data and learn how to create a Top filter.  [Step 6: Build a dashboard to show your insights](http://onlinehelp.tableau.com/current/guides/get-started-tutorial/en-us/get-started-tutorial-build.html)  Learn how to build and format a dashboard to display the visualizations you created.  [Step 7: Build a story to present](http://onlinehelp.tableau.com/current/guides/get-started-tutorial/en-us/get-started-tutorial-story.html)  Learn how to build and format a story to present your findings.  [Step 8: Share your findings](http://onlinehelp.tableau.com/current/guides/get-started-tutorial/en-us/get-started-tutorial-share.html)  Share your findings with your classmates’ onTableau Online, or share them with the world on Tableau Public. |  |
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# Assignment Grade

The Assignment grade will be determined as follows:

***Assignment 80%***

***Discussion Board Contributions 20%***

**Discussion Board**

All students are required to actively participate in the course discussion board, which can be found on Canvas canvas.indiana.edu. Posts can include, for example: tips or new techniques that you have learned while exploring Tableau, interesting public visualizations that you have discovered, a summary of a valuable training video that you watched, etc. **Each student must make one meaningful contribution to the discussion board each week (either a new post or a comment on an existing post).** Students will vote on the most valuable contributions to the discussion board at the end of the course, and these votes will be the primary determinant of each student’s discussion board grade.

**Steps to Take When You Have Technical Questions**

When learning any new software package, you are bound to have technical questions. Investigating and solving these questions is an important part of learning the software. When you have a question about Tableau that you cannot answer on your own, you should follow the following steps:

1. Check the course discussion board to see if this question has already been resolved by your classmates
2. If you did not find the solution in Step 1, consult Tableau’s extensive online resources and training videos:
   1. <http://onlinehelp.tableau.com/current/pro/online/windows/en-us/help.htm>
   2. <http://www.tableau.com/support/manuals/quickstart>
   3. <http://www.tableau.com/learn/training>
3. If you did not find the solution in Step 2, check Tableau’s community discussion forum to see if the solution has been posted there. If your question has never been posted on the forum, then post it yourself and see if you get a response.
   1. Home page: <https://community.tableau.com/welcome>
   2. Beginner: <https://community.tableau.com/groups/newbie-tableau-desktop>
   3. Advanced:<https://community.tableau.com/community/viz-talk/tableau-community-library/calculation-reference-library>
   4. Tips for an effective post: <https://community.tableau.com/docs/DOC-5471>
4. If you did not find the solution in Step 3, ask a classmate for help
5. If you did not find the solution in Step 4, ask your instructor or teaching assistant for help
6. **Post the question that you encountered, along with the solution you found, on the course discussion board.**

Following the above steps will help you develop the ability to research and answer Tableau questions autonomously, while also fostering collaboration among your peers to find and share solutions. These skills will serve you well as you continue to use Tableau after this class is completed.

**Assignment *Option 1***

Each team (or individual) will deliver a final project that uses Tableau to visualize a complex dataset. The deliverable for this project is an executive dashboard or story point that enables a user to explore the data. Students can use one of the many example datasets posted on the course website, or their own data (disguised if necessary for confidentiality). In addition, you must submit a one-page user manual describing how to use your viz to explore the data. Optional: Finally, each team will have 1.5 to 3 minutes during the final class meeting to present their project. Presentations can cover the power of the viz to reveal new insights. Post on the class discussion board technical details regarding how the viz was created.

**Assignment *Option 2***

Each team (or individual) will select a visualization from among the top rated submissions to Tableau Public (links to eligible vizzes will be provided by the instructor). Students will then deconstruct and recreate the entire visualization in order to understand exactly how it was created. After this “reverse engineering” process, each team will have 1.5 to 3 minutes during the final class meeting to give a presentation to the class in which they describe the most innovative, unique, and useful aspects of their selected visualization.

**Assignment Outline**

# Week 1

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| * Introduction to Data Visualization * Connecting to Data * Overview of the Tableau User Interface * Working with Discrete vs. Continuous Data * Basic Charts |

# Week 2

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| * Basic Charts, continued * Creating Dashboards and Story Points * Formatting |
| ***Exercise: Creating the Right Charts for Your Questions***  ***Exercise: Creating a Basic Dashboard*** |

# Week 3

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| * Calculated Fields * Using Maps to Visualize Spatial Data |
| ***Exercise: Using Calculated Fields***  ***Exercise: Effective Use of Maps in Tableau*** |