

Tableau II Exercises

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Exercise 1: Import and Merge Data

1. Click on **Connect > To a File > Microsoft Excel**
2. Open **IPEDS_2022.xlsx**
3. Look at the **Files** pane on the left. Tableau sees that you have another spreadsheet in the same location as your original data source.
4. Drag **IPEDS** from the **Sheets** pane to the open area at the top.
5. Drag **Websites** from **Sheets** next to **IPEDS** so that a line is showing between the two. This tells Tableau that you want to create a **relationship** between your two data sources. Drop **Websites** here.
6. There is a problem creating the relationship. **Look at the box in the lower left.**
7. Under the **IPEDS column** in the box, search for the **Institution Name field** and select it. In the **Websites column**, select **School Name**.
8. Tableau now shows the columns in your **second data source**. Click on the **rectangle at the top labeled IPEDS** to see the columns from your **first data source**.
9. How do we know that our data merged successfully? At the bottom, click on the **Sheet 1 tab**. Look at your **data pane** on the left. Find the **Institution Name** variable and drag it to your **rows shelf**.
10. Scroll toward the bottom of your **data pane** to find the **URL pill** and drag it into the **rows shelf** to the **right of Institution Name**. This table shows us that our Institutions have been connected to our URLs and our relationship was set up correctly.
11. Drag both pills **out** of the rows shelf to remove them.


Exercise 2: Create Groups

1. In your **Data** pane, right-click **Carnegie Classification** and select **Create > Group...**
2. A pop-up window appears. In the **Field Name** text box, type **School Type**.
3. Select all of the **Associate's categories** by clicking on the first item, holding down the shift key, and clicking on the last item. Now, click the **Group button**. Rename the group **Associate's**.
4. Do the same for the **Baccalaureate, Doctoral, Master's** and **Special Focus** categories.
5. Select **Not applicable...** and click the **Group button** to create a group of one. Rename it **None**.
6. Click **OK**.
7. You now have a new variable in the **Data pane** called **School Type**. Drag **School Type** from **Data** to **Rows**.
8. **Scroll down** to the bottom of your **Data** pane.
9. Drag **ipeds_2018.csv (Count)** from **Data** to **Columns**. A bar chart appears.
10. Roll over the **School Type** pill in the **rows shelf** and click on the **arrow**.
11. From the menu, select **Sort**.
12. Under **Sort By**, select **Manual**. Click on the different categories and use the arrow buttons to rearrange them.
13. **Right click** on the **Sheet 1** tab at the bottom and select **Rename Sheet**. Change it to **School Types**.

Exercise 3: Create a Set

1. Next to the **School Types** tab, click the **New Worksheet** icon. 
2. In your **Data** pane, right click on **ID** and select **Create > Set...**
3. A pop-up window appears. In the **Name** text box, type **Competitiveness**.
4. Click on the **Condition** tab and select **By field**.
5. In the **large dropdown menu**, **scroll down** and select **Percent admitted - total**.
6. Click on the **=** dropdown menu and change it to **<=**
7. Change the **0** in the text box to **40**.
8. We are telling Tableau to **create a set of schools whose percent admitted is less than or equal to 40**.
9. Click on **OK**.
10. Drag **Competitiveness** from **Data** to **Rows**.
11. **Scroll down** to the bottom of your **Data** pane.
12. Drag **ipeds_2018.csv (Count)** from **Data** to **Columns**. A bar chart appears.
13. Tableau is telling us **how many schools are in and out of our set**.
14. **Right click** on **In** and select **Edit Alias**. Change it to **Competitive**.
15. **Right click** on **Out** and select **Edit Alias**. Change it to **Non Competitive**.
16. **Right click** on the **Sheet 2** tab at the bottom and select **Rename Sheet**. Change it to **Competitiveness**.

Exercise 4: Create an Interactive Menu to Explore Different Variables

1. Next to the **Competitiveness** tab, click the **New Worksheet** icon. 
2. Drag the **State** pill into the center of the sheet. A symbol map appears. Let's change it to a filled map.
3. Go to your **Marks** pane and change the **dropdown menu** at the top from **Automatic** to **Map**.
4. Drag **Percent of first-time undergraduates – foreign countries** from the **Data** pane into the **Color** box on the **Marks** pane.
5. What if we want to look at **in-state undergrads** instead of international ones? Drag the **in-state** variable into the **Color** box on your **Marks** pane. The map changes.
6. Do the same with **out-of-state** and **residence unknown** variables. This works fine for us in Tableau, but what if **someone else** is viewing this on a **website**? How can they switch out the variables themselves?
7. Above the **scrollbar** in your **Data** pane is a **down arrow**. **Click on it**.
8. Select **Create Parameter ...**
9. Change the **Name** to **Undergrad Residence**.
10. Change the **Data type** to **String**.
11. Next to **Allowable values**, select **List**.
12. For the first item in our list, under **Value**, type **% foreign**.
13. Type in the **remaining items** in our list in **separate lines**: **% in state**, **% out of state**, **% unknown**
14. Click **OK**. Be sure to **clear your search** in the **Data** pane if you have one.
15. You now have a **Parameters pane** in the bottom left. Right-click **Undergrad Residence** and select **Show Parameter Control**. A dropdown list appears on the right of your screen. Select an item in the list. Nothing changes!

16. Click on the **down arrow** at the **top right** of your **Data** pane and select **Create Calculated Field...**
17. Name it **Undergrad Residence Control**
18. Type in the following code:


```
CASE [Undergrad Residence]
WHEN '% foreign' THEN [Percent of first-time undergraduates - foreign countries]
WHEN '% in state' THEN [Percent of first-time undergraduates - in-state]
WHEN '% out of state' THEN [Percent of first-time undergraduates - out-of-state]
WHEN '% unknown' THEN [Percent of first-time undergraduates - residence unknown]
END
```
19. Click **OK**.
20. Scroll down to the bottom of your **Measures** pane and drag **Undergrad Residence Control** into the **Color** box on your **Marks** pane.
21. So far, we've been **adding up** the percentages for **every school in a state** together. Let's use the **average** percentage instead. **Right click** on the **Undergrad Residence Control** pill in the **Marks** pane. Select **Measure > Average**.
22. Change the selection for your **Undergrad Residence** dropdown menu. Now the map changes!

Exercise 5: Add Specific Locations and Customized Tooltips to the Map

1. To map individual locations in Tableau, you need to have the **latitude** and **longitude** for each location as part of your data set. When combining individual locations with generalized locations, you will need to use **multiple map layers**.
2. Before we can add latitude and longitude as a new layer on the map, we'll need to create a **calculated field** to combine them. Click on the **down arrow** at the **top right** of your **Data** pane and select **Create Calculated Field...**
3. Name it **School Locations**.
4. Type in the following code:



```
MAKEPOINT([Latitude location of institution], [Longitude location of institution])
```
5. In the **Data** pane, find **School Locations** and drag it onto the map. The **Add a Marks Layer** box appears. Drag the Locations pill onto the box.
6. Look at your **Marks** pane. There are now **two different tabs**, one for each layer.
7. **Roll over** the individual locations. Notice that they **are all highlighted at once** and we have **no tooltip**. This is because Tableau doesn't know what **level of detail** to use for these locations.
8. With the top tab of your **Marks** pane open, Drag **ID** onto the **Detail** box and roll over the locations again. We can now see each of their tooltips. Right now, the tooltips aren't very informative. Let's add some more information.
9. Drag **Institution Name** from **Data** to the **Tooltip** box in the **Marks** pane.
10. **Roll over** a school location again. Now we can see the school name.
11. Drag **Control of Institution** from the **Data** pane into the **Color** box on the **Marks** pane to give our school locations different colors.

Exercise 7: Add a Worksheet Action to the map

1. Scroll down to the bottom of the **Data** pane.
2. Drag the **Website** pill from the **Data** pane to the **Details** box on the **Marks** pane. Nothing happens visibly, but we have now attached the URL data to this sheet.
3. Our tooltips are now getting a bit cluttered. To edit them, click on the **Tooltip** box in the **Marks** pane. Delete everything except for **<ATTR(Institution Name)>**.
4. Change the **dropdown menu** from **Responsive** to **On Hover**. We need to do this if we want clickable links to appear in the tooltips. Click **OK**.

5. In the menu at the top, go to **Worksheet > Actions...**
6. Click **Add Action > Go to URL...**
7. Click on the **Insert button** next to the **Name** text box and search for **Website**. Click on it.
8. There is another text box under **URL** at the bottom. Click the **Insert button** next to it and select search for **Website**. Click on it, then click **OK**.
9. Click **OK** again.
10. Roll over a location on your map. The website link is now clickable!

Exercise 8: Create a Dashboard and edit Dashboard Actions

1. Near the tabs at the bottom, click the **New Dashboard icon**. 
2. On the left is a menu for **Size**. Click on it to get a pop-up box.
3. Inside the pop-up box is a menu called **Range**. Click on it and select **Automatic**.
4. Drag **Undergrad Residence** from the **Sheets** pane on the left into the **blank area** at the center.
5. Drag in the **School Types** sheet **under** Undergrad Residence.
6. Drag **Competitiveness** to the right of **School Types**.
7. Resize your visualizations and move your legends and parameter closer to the visualizations they correspond with.
8. Click on the **By State map** so that it has a **grey border** around it. Click on the **filter icon**.
9. Click on a state in the **By State map** to filter the data.
10. There is a problem! **Our filter isn't working correctly**. This can happen when we are using **both generalized and specific locations** on the same map. To fix the filter, we will need to **edit** our **dashboard action**.
11. In the menu at the top, go to **Dashboard > Actions...**
12. Click on **Filter 1 (generated)** and select **Edit...**
13. Change the **Name** to **State Filter**.
14. Look at the **Filter** section at the bottom of the pop-up window. Note that we are using **All Fields** in the filter. **This is the cause of the problem**. We **only** want to use the **State Abbreviation** field.
15. Click on **Selected Fields**, then press the **Click to add** button.
16. Search for **State Abbreviation** and click on it.
17. Click **OK** twice.
18. Now click on a state in the map. The school types and competitiveness charts are filtered by that state.