**Data Visualizations using Microsoft Excel**

**Univariate Visualization**

**Number of Players by Team: Bar Chart**

Using the MLB\_Rank\_BattAvg\_2018.xlsx data set, we will create a bar chart of the variable Team. This will produce a visualization of the number of records (in this case, players) per team.

1. You’ll first need to create a frequency, or pivot table.

2. Open the Insert tab at the top of the window.

3. Click Pivot Table at the top left.

4. Excel will automatically choose all of the data in the worksheet.

5. Click OK. A new worksheet will open.

6. In the PivotTable Fields section on the right, drag and drop Team to the Rows box and to the Values box.

a. This creates a table that lists each team once in column A and lists the number of times it appears in the data set in column B.

7. Highlight both columns by clicking on A and dragging your cursor over B.

8. Open the Insert tab at the top of the window.

9. In the middle of the tools ribbon at the top, you will see a variety of graphs you can create. If you hover your mouse over the graph in the top left of these choices, the word ‘Column’ will appear.

10. Click on this icon, and a window with a variety of graph options will appear.

11. Choose the Clustered Column chart, in the 2D section at the top left. A bar graph of Team will appear.

a. You should see a graph that does not include Grand Total. If you see Grand Total, you will have to select your data manually.

b. To select your data manually, right click in the graph and choose Select Data. Highlight all team names and values and click OK.

12. Make the graph larger so that it is easier to work with – you can do this by clicking and dragging the squares on the corners and sides of the graph. A good size is about 11 x 6, but you can make it larger if you’d like.

The following steps are focused on formatting the graph.

13. Click on the legend on the right that says Team and delete it.

14. Click on the title at the top that currently says ‘Team’ and change the title to Number of Top Ranked Major League Baseball Players by Team.

15. Click on the Home tab at the top of the window. Highlight your new title and make sure it is in Calibri Light, 20pt. font.

16. Click on the team abbreviations on the x-axis to activate the axis. Change the font to Calibri Light, 12pt. This will change the angle of the labels.

17. While you have the x-axis activated, go to the Format Axis tab on the right.

18. Choose the paint can icon and open the line options. Choose No Line.

19. Click on the numbers on the left to activate the y-axis. Delete this axis.

20. Click on one of the graph lines and delete the lines.

21. Click anywhere in the white area of the graph and go to Format Chart Area on the right.

22. Under Boarder choose No Line.

23. To add values to each bar in the graph, click on one bar to highlight them all. Right click and choose Add Data Labels.

24. To make the data labels a bit larger, click on one data label to highlight them all. In the Home tab, change the font to Calibri Light, 12pt.

25. Change the color of the bars. To do this, click on one bar to choose them all.

26. Right click and choose Format Data Series.

27. Click on the paint can icon and open the Fill options.

28. Click on the paint can on the bottom right, and go to More Colors.

29. Locate that sliders icon (typically the second from the left at the top of the More Colors window), and choose RGB Sliders from the dropdown

30. Change the Hex Color to 8B1F41, or RGB colors to 131, 34, 65. This should change the color of the bars to Chicago Maroon.

31. To change the order of how the bars appear, click on one of the bars to highlight them all.

32. Right click, and choose Sort.

33. Choose Sort for Largest to Smallest. This should put BOS on the left and SF on the right.

34. To make the bars wider, click on one of the bars to highlight them all.

35. Go to Format Data Series on the right.

36. Click on the bar graph icon and change the Gap Width to 50%.

37. To copy and paste your graph, click somewhere near the edge of the graph, copy (Ctrl+C on a PC, command+C on a Mac), go to your destination document, and paste (Ctrl+V on a PC, command+V on a Mac). We don’t recommend taking a screenshot, as this is not editable.

**Bivariate Visualization**

**Runs by At Bats: Scatterplot**

Using the MLB\_Rank\_BattAvg\_2018.xlsx data set, we will create a scatterplot of the relationship between At Bats (the explanatory variable) and Runs (the response variable).

1. Highlight the columns containing the AtBats and Runs. These should be columns F and G in the spreadsheet.

2. Go to the Insert tab at the top of the Excel window.

3. Towards the middle of the screen at the top, you will see various charts. Click on the one that looks like a scatterplot and choose the first chart option under Scatter.

4. You should see a scatterplot where At Bats are located on the x-axis and Runs are located on the y-axis. To ensure this is the case, look at the values in each of the columns and see if the ranges for the x and y axes align to the variables.

5. Resize the graph so it is large enough to work with.

6. Your title should say ‘Runs’. Change this to MLB 2018 Runs by At Bats, in Calibri Light 20 pt. font.

7. You will want to leave the numbers on both the x and y axes – make these Calibri light, 10pt. font.

8. You will need to add labels to each axis. To add an x-axis label, click somewhere in the graph to activate it, and go to the Chart Design tab at the top.

9. At the top left of the Chart Design ribbon, you will see Add Chart Element. Click here and scroll down to Axis Titles.

10. Choose Primary Horizontal and rename the x-axis At Bats. Make this Calibri Light 12pt. font.

11. To add a y-axis label, repeat steps 7 and 8.

12. Choose Primary Vertical and rename the y-axis Runs. Make this Calibri Light 12pt. font.

13. To add the line of best fit to the graph, go back to Add Chart Element, scroll down to Trendline, and choose Linear.

14. Click on the line of best fit in the graph so that a blue dot appears at each end. The Format Trendline section may automatically open, or you may need to right click and choose Format Trendline.

15. In the Paint Can tab, choose Solid Line, and change the color to the darkest grey under Theme Colors.

16. Remove the horizontal grid lines by clicking on one and pressing Delete.

17. Remove the same for the vertical grid lines in the same manner.

18. Change the color of the dots by click on one to active them. This may open the Format Data Series section – if not, right click and choose Format Data Series.

19. Click on the paint can, and go to Marker

20. Change both the fill and the border to Hex Color 8B1F41, or RGB colors 131, 34, 65.

21. Remove the border around the graph by right clicking in the white space of the graph, choosing Format Plot Area, and choosing No Line under Border in the Paint Can tab.

22. Because all of our data are at the top right portion of the graph, let’s adjust the scales of the x and y axes to zoom in a bit.

23. Click on the y-axis until you see a box around the values on the axis. Right click and choose Format Axis.

24. Under Axis Options, you can change the bounds of the axis. Set the minimum to 20 and leave the maximum at 140.

25. Repeat steps 20 and 21 for the x-axis, but change the minimum to 400 and leave the maximum at 700. This should make the data appear more spread out and easier to visualize.

26. To copy and paste your graph, click somewhere near the edge of the graph, copy (Ctrl+C on a PC, command+C on a Mac), go to your destination document, and paste (Ctrl+V on a PC, command+V on a Mac). We don’t recommend taking a screenshot, as this is not editable.

**Additional Practice with Excel**

For additional practice creating visualizations in Excel:

* Visit<https://stephanieevergreen.com/how-to/>. Keep in mind that most of these visuals require summary statistics as opposed to a raw data set. You can compute summary statistics from your raw data.
* Try editing some of the templates provided in the PowerPoint file provided. Again, these visuals require summary statistics.