

## Lab 2: Your first web page

### Due date

**DUE DATE: 3/3/2017, by 5pm. Demo in lab section/TA office hours.**

### Overview

In this lab we will walk through the usage of Microsoft Excel to create bar charts, pie charts, and histograms. Additionally, we will convert the charts to images and host them on our website. You should think along the way about why the different charts are used to convey data in different ways.

### Goal

Learn Excel bar charts, pie charts, and histograms. Contrast which representations are better in which situations.

### Objectives

You will create multiple of each type of chart using real data provided by the textbook. You will then communicate these charts by hosting them on your webpage. You will finish by answering questions that have you think about the data and its representation.

### Preparation before lab

You should read over Activity 1.2 and 1.3 in the textbook. Ensure that your WileyPLUS account is linked to the course.

### Lab Description

Your task will consist of three parts **(50 points total)**:

- Complete the graphing portions of Activity 1.2 and 1.3 in Excel.
- **(33 points)** Add charts from Excel, with explanations, to your CSE 111 Lab 2 webpage.
- **(17 points)** Complete related assigned questions on WileyPlus.

### Deliverables

- **cse111/lab2.html**: You should update your webpage with the appropriate charts and explanations.
- **Images of graphs**: You will need to save your images of your graphs from excel and put them in an images folder where lab2.html can load them.
- **lab2.xlsx**: You should create all of the required charts for the lab in one file under different sheets.
- **Submit lab2.html and lab2.xlsx** to Lab 2 on UBLearn.
- **Demo your site** to a TA, in lab or office hours, and briefly discuss your explanations.

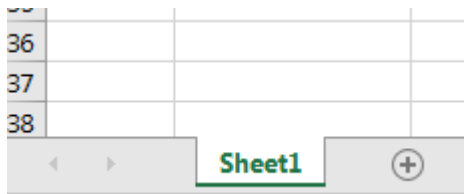
### Instructions

1. Read through Activity 1.2 and Activity 1.3 in the textbook.
2. Open a new file in Excel and save it as: **lab2.xlsx**

**(throughout this lab, make sure you regularly save your file so you don't lose your work)**

#### Activity 1.2 Medical Data and Class Data: Graphs with Excel

3. Microsoft Excel is a powerful computer program that allows you to manipulate data and create graphs. (In Excel, a graph is also called a chart.) In this activity, you will use Excel to create bar graphs and pie charts and more importantly, you will use these charts to help understand and interpret the data.
4. Change the name of the sheet from **Sheet1** to **ER Data**.



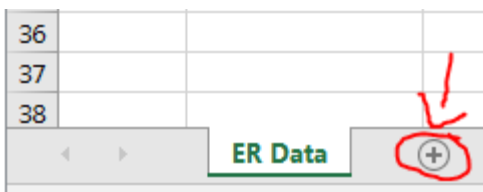
5.
  - a) Right-click **Sheet1** -> Select Rename -> Type **ER Data** -> Press Enter.
6. Consider the following data on principal reasons given by patients for emergency room visits in 2003:

	A	B
1	Reason	Number of Visits (in thousands)
2	Accidents	3,999
3	Arm/leg injuries	3,758
4	Back symptoms	2,696
5	Breathing problems	4,568
6	Chest pain	5,838
7	Cough/throat symptoms	6,295
8	Earache/ear infection	1,867
9	Fever	5,732
10	Head/neck symptoms	4,641
11	Nausea/dizziness	5,280
12	Nonspecific pain	2,234
13	Skin rashes	1,688
14	Stomach pain	7,583

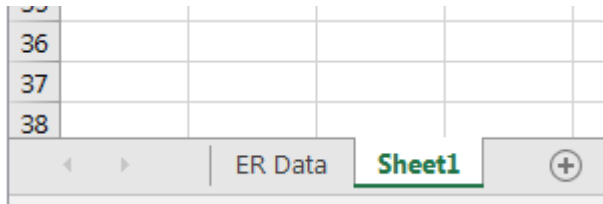
Source: *The World Almanac and Book of Facts 2006*, p. 190.

- a) Enter the data and titles into the first two columns of an Excel worksheet, just as they appear in the previous table (cells A1 through B14).

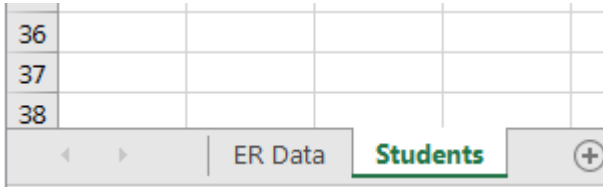
- b) Click on cell **A1** and drag to cell **B14** to select the data set. Then click the **Insert** tab and select **Column** from **Charts** and select **Clustered column** (the first type in the top row) for **Chart sub-type** (if you hover your mouse over the chart type, it will display the name).
  - c) To change the title of your graph, click on the title in the graph and then click again. You can now backspace or delete and retype a new title.
  - d) To add axis titles to your graph, click inside the border of the graph. You will see the **Chart Layouts** group near the top of your screen. Click the bottom down arrow on the right edge of the Chart Layouts group. Click on Layout 9 (the rightmost one in the third row.) In your graph, click on the words "Axis Title" and type appropriate titles. Also click on the Legend and press **Delete** to remove it.
  - e) Click in a blank area of the graph. The chart now has eight "handles" indicating that it has been "selected." If you select a handle (getting a double-headed arrow) and then press and hold the left mouse button on drag it, you can resize the chart. By clicking on the white interior of the chart and holding down the mouse button, you can drag the chart to another location. Click outside the chart to "deselect" it.
  - f) To sort data, return to cell A1, and then click and drag to cell B14 to select the complete set of data. Select the **Data** tab and then select Sort. Sort by **Number of visits**, sort on **Values** and Order **Smallest to Largest**.
7. Now you'll use Excel to create a pie chart of these data.
  - a) To create a pie chart, as you did before, highlight the data and labels. Go to the **Insert** tab and select **Pie** and the first chart sub-type, **Pie**, from among the choices.
  - b) Click on the title to change it if needed.
  - c) Click inside the graph and then click the bottom down arrow on the right edge of the **Chart Layouts** group. You will see pie chart options that allow you to label the pie pieces and/or show values or percents. (Note that you want to be able to clearly read the chart, so including a legend and data labels will make your chart easy to read.) Click on one of the **Layouts**.
  - d) To change a bar graph to a pie chart, go back to the graph you created. Select the completed bar graph by clicking inside the border.
  - e) From the **Type** group at the top left of your screen, select **Change Chart Type**. In the left field, choose **Pie** (for chart type) in the first box and **Pie** (for chart sub-type), the first choice in the bottom row, in the second box. Click **OK**.
  - f) Now click inside the border of your graph to access the **Chart Layouts** group and choose the layout you want for your pie chart.
8. Make a new sheet within Excel named **Students**.



- a) Click the + symbol to make a new sheet.



- b) Rename this new sheet **Sheet1** to **Students**.



- c) You should now have these two sheets. Make sure the new sheet **Students** is selected.
9. Consider the following data on number of miles from the college to home was collected from a group of 12 students:

Student	Miles	Student	Miles
John	23	Sally	3
Jean	45	Mitch	1250
Harry	11	Taro	322
Bruce	134	Gary	95
Fred	62	Audrey	76
Ann	35	Josi	28

- a) Use Excel to create a pie chart for this data set in the sheet **Students** (Think about how you want your pie chart to show the data. You will need to put the data into categories first. You can use columns D and E of the same Excel worksheet.)
- b) Click on your pie chart, click *Copy*. Click in a cell outside of your pie chart and then click *Paste*. Change this chart to be a bar chart.
- c) Think about which chart better represents your data.

### Activity 1.3 SATs and the Super Bowl: Creating and Interpreting Histograms

10. A histogram is a graph of a frequency distribution and is a useful way to give a pictorial summary of a set of data involving a quantitative variable. In this activity, you will create and interpret histograms.
11. Create a new sheet in your Lab2 excel file. Rename this sheet to: **SAT**
12. Download the 1.3.1 SAT data file in WileyPLUS: Read, Study, & Practice -> Topic 1 -> Excel Data File 1.3.1 SAT data. (if you cannot find this, go to: <http://bcs.wiley.com/health/bcs/Books?action=resource&bcsId=7797&itemId=0470592710&resourceId=30212>)

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## Data Files

[Excel Data File: 1.2 Class Data Gender](#)[Excel Data File: 1.3.1 SAT data](#)[Excel Data File: 1.3.2 Super Bowl](#)[Excel Data File: 1.3.3 Governors' Salaries](#)

## Web Resources

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## Graphing Calculator Activities

[Graphing Calculator Activities: Topic 1](#)

13. Open the file EA1.3.1 SAT data.xls, copy the two columns into your Lab2 file (Select columns A and B, click copy. Click the cell A1 in your Lab2 file on sheet titled **SAT** and click paste.) Close EA1.3.1 SAT data.xls.
- You should be working in Lab2.xlsx on sheet SAT.
  - One way to create histograms is to use the **Insert** tab discussed previously. The **Insert** tab is designed to use with data that have been grouped—either categorical data or quantitative data—into classes or intervals. To create a histogram using the **Insert** tab, you will group the data, which is not too difficult if you first sort it.
  - You'll create a histogram of the “percent taking SATs” for all the states, so first sort the data by this column; however, be sure to highlight both columns and then begin to perform the sort. Select the **Data** tab and **Sort**, and then sort by the appropriate column from smallest to largest.
  - Next decide what the “bins” will be. That is, you need to decide what classes (of equal width) to use to group the data. For this data set, it appears that  $0 < \% \leq 10$ ;  $10 < \% \leq 20$ ;  $20 < \% \leq$

30, and so on will be convenient classes. Use your sorted data to count the number of data values that fall into each of these classes, and create a table in columns E and F of your Excel worksheet with the class labels in column E and the frequencies for each class in column F. (Include axis titles.)

- e) Use this table of classes and frequencies, and create a bar graph like you did previously.
  - f) To make this completed bar graph look like a histogram, adjacent bars should touch one another. To change the bar width, right-click on one of the bars of the finished graph to access the **Format data series** dialog box. From **Series Options**, change the **Gap width** from **150%** to **0%**. Then click **Close**.
  - g) You may add titles and experiment with some of the other features of bar graphs (like adding or taking away axis labels and so on).
14. Here is another method to create a histogram with Excel. For this histogram, you'll use a file containing data about the points scored by the winning team in the Super Bowl for the years 1967 to 2011.
15. Make a new sheet in your Lab2.xlsx file and name it: **Super Bowl**
16. Retrieve the "EA1.3.2 Super Bowl.xls" file from the text website or WileyPLUS. You'll make a histogram of the variable "points scored by winner."
17. Open the file EA1.3.2 Super Bowl.xls, copy the two columns into your Lab2 file (Select columns A and B, click copy. Click the cell A1 in your Lab2 file on sheet titled **Super Bowl** and click paste.) Close EA1.3.2 Super Bowl.xls. (if you cannot find this, go to: <http://bcs.wiley.com/he-bcs/Books?action=resource&bcsId=7797&itemId=0470592710&resourceId=30212>)

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## Data Files

[Excel Data File: 1.2 Class Data Gender](#)[Excel Data File: 1.3.1 SAT data](#)[Excel Data File: 1.3.2 Super Bowl](#)[Excel Data File: 1.3.3 Governors' Salaries](#)

## Web Resources

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## Graphing Calculator Activities

[Graphing Calculator Activities: Topic 1](#)

- a) You can also create a histogram using Excel's **Analysis ToolPak**, which groups the data into classes for you.
- b) The **ToolPak** may need to be installed; to check, choose the **Data** tab. If the Ribbon shows an **Analysis** group, select **Data Analysis** from the **Analysis** group. If **Data Analysis** is not shown on the Ribbon, proceed as follows to install the Analysis ToolPak.
  - i. To install the **Analysis ToolPak**: Click on **File** and then click **Options** at the bottom of the menu window that opens. Choose **Add-Ins** on the left box under **Excel Options**, and at the bottom of the **Add-Ins** box, for the **Manage** box, select **Excel Add-Ins**.
  - ii. Click **Go**. In the **Add-Ins available** box, select the **Analysis ToolPak** check box, and then click **OK**. (If **Analysis ToolPak** is not listed in the **Add-Ins available** box, click **Browse** to locate it.) If you get a prompt indicating that the **Analysis ToolPak** is not currently installed on your computer, click **Yes** to install it.
- c) From the menu bar, choose **Data** and then **Data analysis** from the **Analysis** group; scroll down to the **Histogram** option and click **OK**.
- d) In the dialog box, type the reference for the range of your data, **B1:B46** in the **Input range** area, or click and drag from cell B1 to cell B46. Leave the **Bin range** field blank to allow Excel to select the bins (or groupings) for your data. Check the **Labels** box because B1 (where there is a label for the column) has been included in the **Input range**. Click to select **Output range** and Type **C1**

for **Output range** to denote the upper left cell of the output range, and check the box **Chart output** to put the histogram on the same sheet of the workbook as the data. For now, you won't use the other options (**Pareto** and **Cumulative percentage**.) Click **OK**.

- e) The output entries under **Bin** in the C column are the upper limits of the boundaries for each class, and the corresponding frequencies appear in cells in the D column. (Notice the numbers at the bottom of each bar in the histogram.)
- f) Adjacent bars should touch in a histogram. To change the bar width, right-click one of the bars to bring up the **Format data series** dialog box. On **Series Options**, change the **Gap width** from **150%** to **0%**. Then click **Close**.
- g) To create a slightly different histogram using “bin” intervals that you choose, type **My Bins** (or any other appropriate label) in cell E1. (You may need to move your histogram.) Because the data values range from 14 to 55, you can use intervals of width 5, beginning with the interval from 10 to 15. So enter the values **15, 20, 25, 30, 35, 40, 45, 50, 55** in cells E2:E10. (This creates the bins or classes of:  $10 < \text{points scored} \leq 15$ ;  $15 < \text{points scored} \leq 20$ ;  $20 < \text{points scored} \leq 25$ ; and so on, to the last class,  $50 < \text{points scored} \leq 55$ .) Notice that the right endpoint of each interval or class is included in the interval but the left endpoint is not.
- h) Use the procedure for creating a histogram described previously, but type **E1:E10** in the **Bin range** area and type **G1** for **Output range**.

#### 18. Some Selected Enhancements to Your Histogram

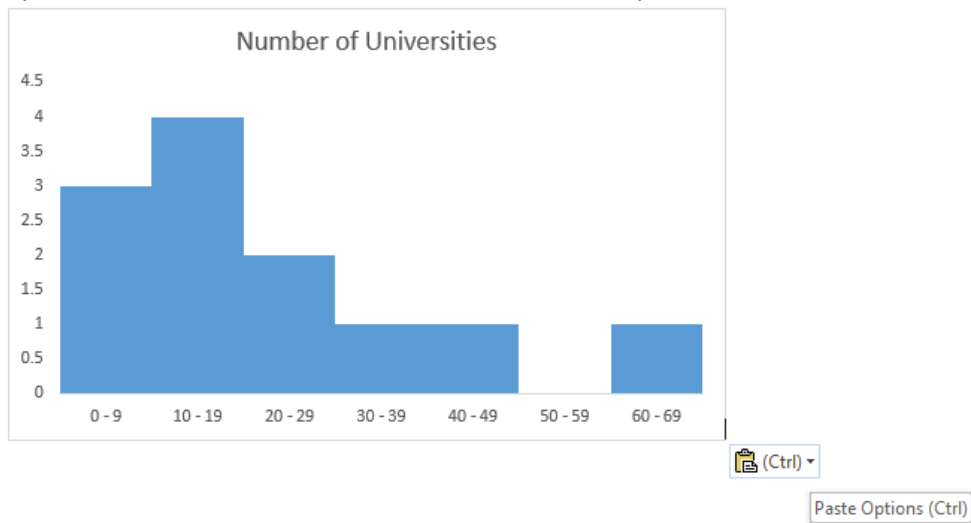
- a) Here is an additional way to get rid of the legend. To do this, click the legend (the word *frequency* on the chart). Select the **Layout** tab. Click **Legend** (in the **Labels** group) and select **None** to turn off the Legend Option.
- b) You can resize both the plot area (the gray region containing the histogram) and the larger rectangle by clicking in the boundaries and dragging the appropriate handles horizontally, vertically, or diagonally. Click outside the chart to “deselect.”
- c) To change the chart title, click the title word *Histogram*. A rectangular gray border with handles will surround the word. Click the word *Histogram* again and type an appropriate title. When finished, click outside the graph.
- d) Click the words *My Bins* at the bottom of the chart and type in an appropriate X-axis title.
- e) The **More** interval with **0** counts shouldn't be there. In the workbook cell containing the word *More*, change the label to **60**. The histogram is dynamically linked to the data and the label on the X-axis changes to 60.

#### *Save your charts as images*

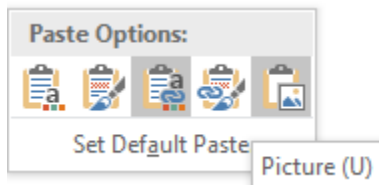
#### 19. From each of your sheets, you will need to save one of the charts you generated:

- a) Click on the sheet and click on a chart.

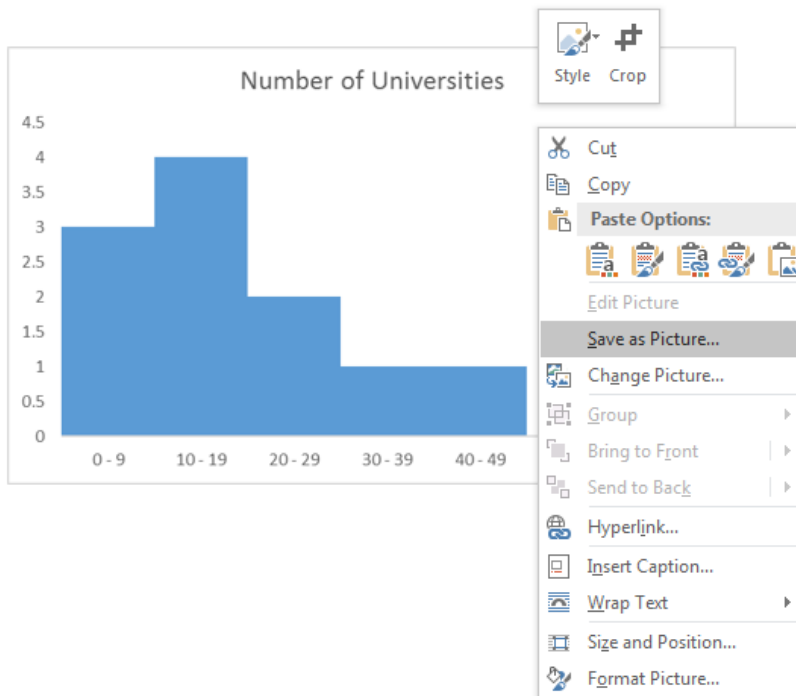
b) Open Microsoft Word. Paste the chart. Select Paste options:



Click the Picture option:



c) Right-click the picture and select "Save as Picture..."



d) Save the file with the same name as the sheet the chart came from.

20. At the end of this, you should have 4 images: ER.png, Students.png, SAT.png, Super Bowl.png

*Within lab2.html*

21. Open the folder containing your lab2.html files (Open Windows Explorer -> S:\public\_html\cse111
22. Create a folder called: **images** inside your cse111 folder.
23. Copy all 4 images created previously into the folder **images**.
24. Open your lab2.html file.
25. Scroll down to the part of the file with the text:

```
<p>
  <!-- Content. -->
</p>
```

- a) Following this you should create 4 pairs of 2 rows as follows:

- i. <div class="row">

```
    
```

```
</div>
```

- ii. <div class="row">

```
    <p>
```

Description of information conveyed in chart.

```
    </p>
```

```
</div>
```

- iii. Here, you should replace *CHART-NAME.png* with the appropriate names of the images you created.
- iv. You should replace Chart description with the title of your chart.
- v. The description should explain what the chart is showing and a conclusion you can draw from the chart.

- b) When this is completed, the 4 images should be visible on your webpage with an appropriate description of each chart.

*Within WileyPLUS Lab 2 Questions*

26. Complete the assigned questions **Lab 2 Questions** on WileyPLUS.

**IMPORTANT: These are required for getting a grade for your lab.**

1. Make sure you upload **lab2.xlsx** and **lab2.html** to Lab 2 on UBLearn.
2. Make sure you complete the assigned questions on WileyPLUS.
3. Demo your work to the TA, showing your files are hosted on your website and briefly explain your charts.

**DUE DATE: 3/3/2017, by 5pm. Demo in your lab section/TA office hours.**