A. Overview

In this tutorial, we will use the example research question from your handout:

During which season is the highest abundance of animals present in the limestone gorge vegetation type?

First, we filtered the data in WildCam Lab to include only photos from the limestone gorge vegetation type. To analyze the data to address the research question, we will create a bar graph showing the total number of animals captured in trail camera photos in the limestone gorge in each season. You may have to filter your data differently and make a different type of graph to answer your own question later.

B. Make a Pivot Table

For research questions in which you need to add up the number of animals in a particular category (e.g., number of animals in each season), creating a **pivot table** is a quick and easy way to analyze your data. *If you think your data needs to be analyzed in a different way, consult your instructor for guidance.*

1. Open the spreadsheet you downloaded from WildCam Lab and immediately save it as an Excel file (.xls or .xlsx).

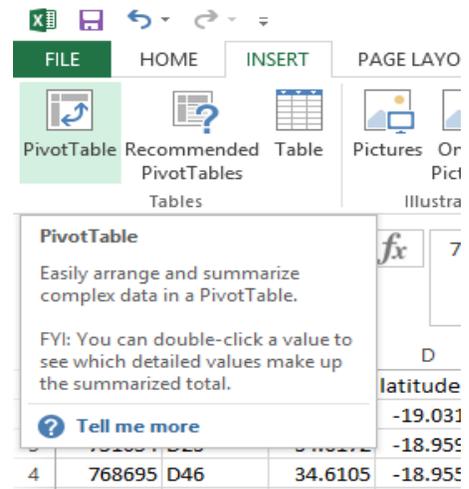2. Click the **Insert** tab and select **Pivot Table** (Figure 1).

Figure 1: Inserting a pivot table.

3. Click on the button next to **Table/Range**. Navigate to your data and click on the letter "A" to highlight the first column. With the left mouse button held down, drag the cursor to the last column to highlight the entire data set. Under "Choose where you want the PivotTable report to be placed," select **New Worksheet**. Click **OK** (Figure 2).
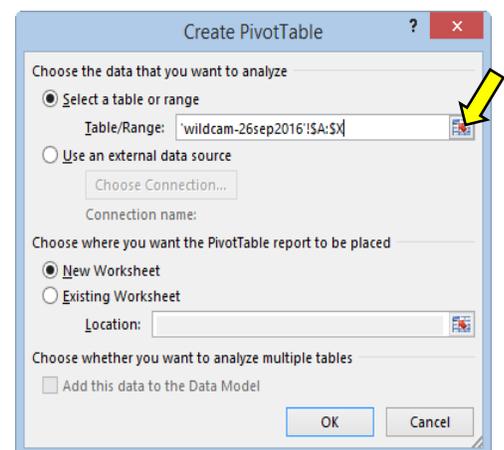

Figure 2: Selecting the range of data.

C. Build the Correct Pivot Table

A pivot table can be used to group data by certain variables. In this example, the numerical variable, "species_count," will be grouped by the categorical variable, "season." To build the pivot table, you will follow the steps explained below to place the grouping variable (season) in the ROWS field and the variable(s) being grouped (species_count) in the VALUES field. You can group data by more than one variable, and you can also group more than one variable.

4. In order to create a bar graph that shows the number of animals in each season, you will need to select the "season" and "species_count" fields in the list of **PivotTable Fields** (Figure 3).
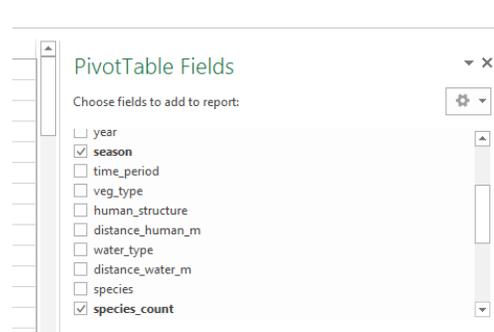

Figure 3: Selecting the fields to use in building the pivot table.

5. By default, the fields you select will appear in the ROWS field. Drag the "species_count" variable to the VALUES field (Figure 4). This will produce a table with the seasons in one column and the species_count in the other column.
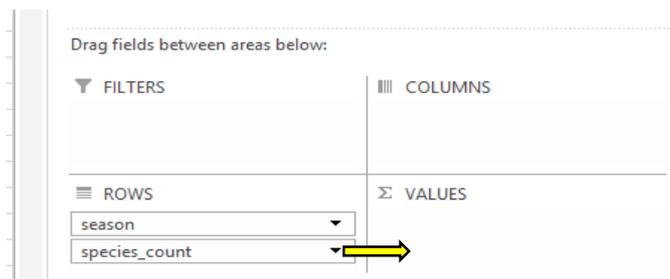

Figure 4: Moving the species_count variable to the VALUES field.

6. In the VALUES column, make sure that the setting for your variable (species_count) is appropriate for the dependent variable you have chosen. In this case, we want to sum the variable "species_count." The default is to count the number of observations (photos), but we want to total the <u>number of animals</u> observed in each photo. Click on **Count of species_count** in the VALUES column and click on **Values Field Settings**. Select "Summarize Values By" **Sum** (Figure 5).
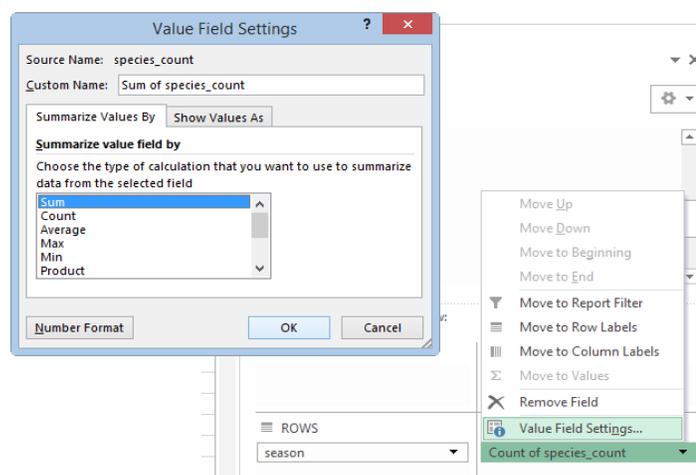

Figure 5: Choosing how to summarize the value field.

D. Create a Bar Graph

7. To create a bar graph, select the data inside the pivot table (in this case, cells A4:B7), click the **Insert** tab, and select the **Column** chart dropdown arrow. Choose the 2-D clustered column chart type (Figure 6).
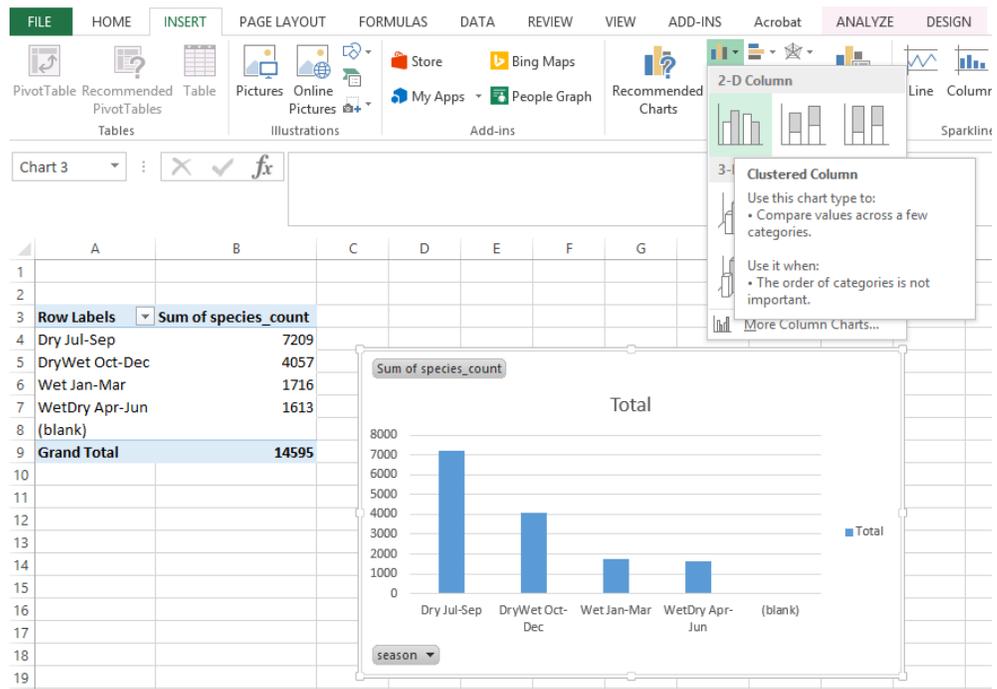

Figure 6: Inserting a bar graph to graph the data from the pivot table.

8. Customize your graph to meet your instructor's guidelines for any report that is due from this activity (Figure 7).
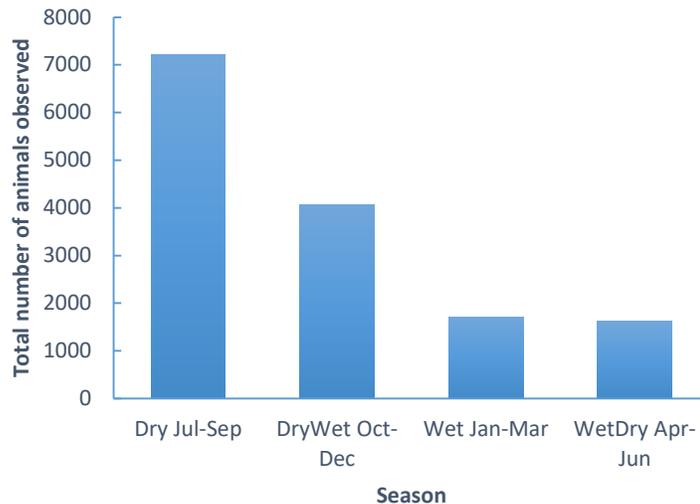

Figure 7: Bar graph of the number of animals photographed in the limestone gorge vegetation type in each season.

E. Answering <u>Your</u> Question

In this activity, you came up with your own testable research question. Now you will use the techniques from this tutorial to create a graph to explore your research question.

First, ask yourself which type of graph you need to create to help answer your question. Which variable(s) are independent variables (Rows), and which ones are dependent variables (Values)?

Step 1: Create a Pivot Table

Once you have downloaded the data from the WildCam lab, follow the instructions in Section B to create a pivot table as you did for the example in the tutorial.

Step 2: Build the Correct Pivot Table

Use the instructions from Section C to build the correct pivot table. You will only select the variables that you need to create your graph. Drag the appropriate grouping variable(s) (your independent variable(s)) to the ROW field. Drag your dependent variable(s) to the VALUES field, and be sure to select the correct calculation (e.g., count, sum, average, etc.). If you are unsure which variables belong in which field, test it out and see if the pivot table makes sense. You can always drag variables back if you made a mistake.

Step 3: Create a Bar Graph

Use the instructions from Section D of this tutorial to guide you. Consult with your instructor to determine whether a different type of graph is necessary to present your data.

Note: The version of Excel used in this tutorial is Excel 2013 for PC. Not all features and functions may work the same way in other versions of Excel.