Visual Basic Functions for Natural Resource Programming

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Lesson 5

Objectives:

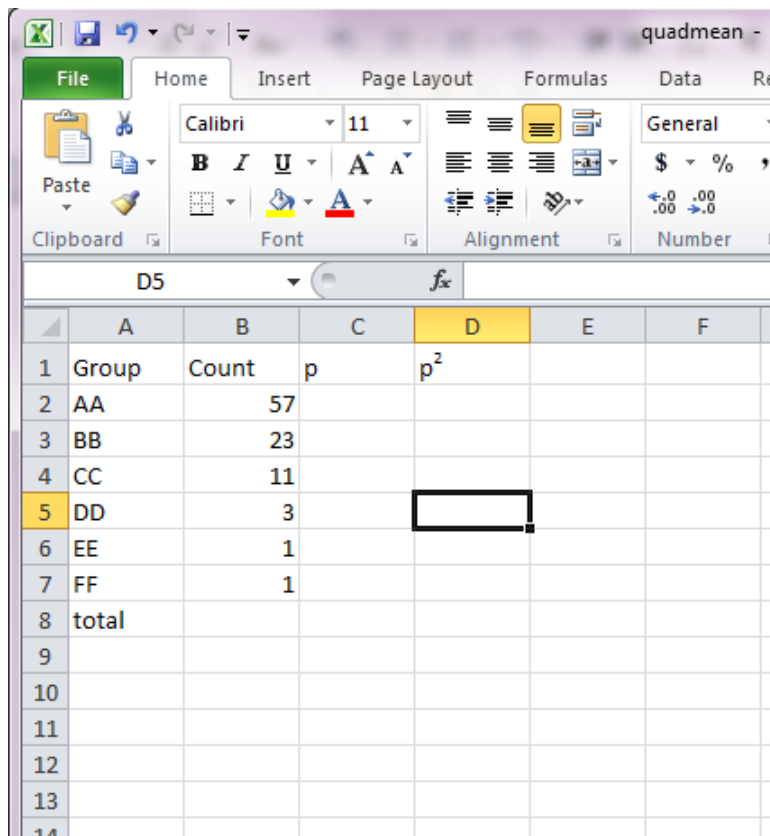In this lesson we will learn:

- • Learn to program a Shannon's index function.
- • Learn some basic syntax.
- • Learn to take log in different bases.
- • Learn to use the absolute value function
- • Learn to run the function we just made.

Please refer to the previous lessons for detail not described here.

Shannon's index of diversity function

Let's calculate a Shannon's index of diversity in the spreadsheet, first we have a column of data:

Figure 1, Count data entered in a spreadsheet
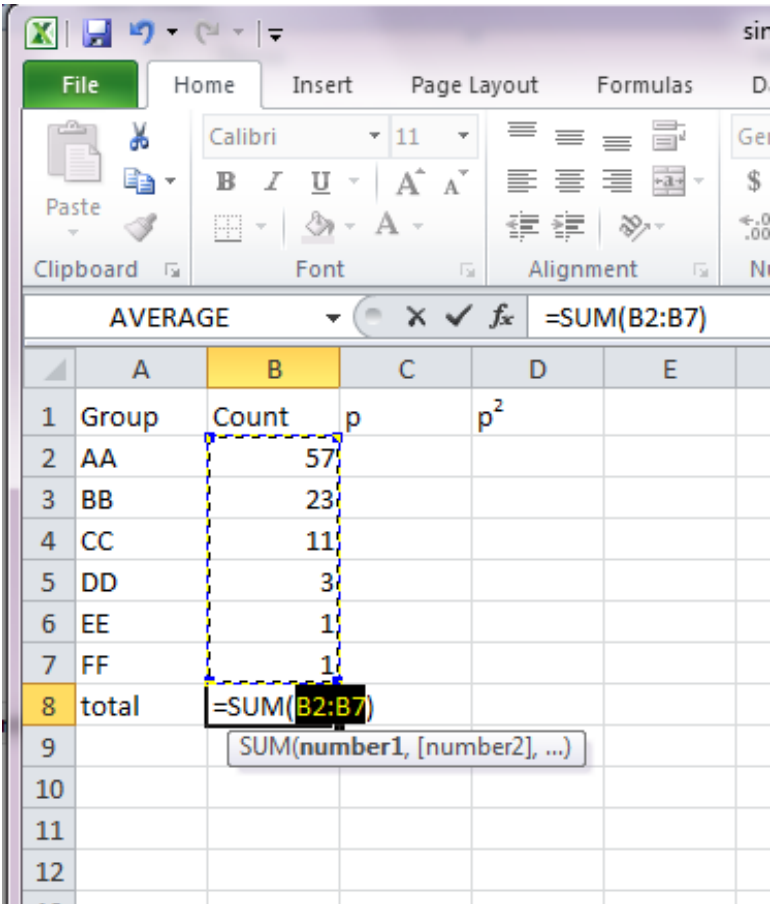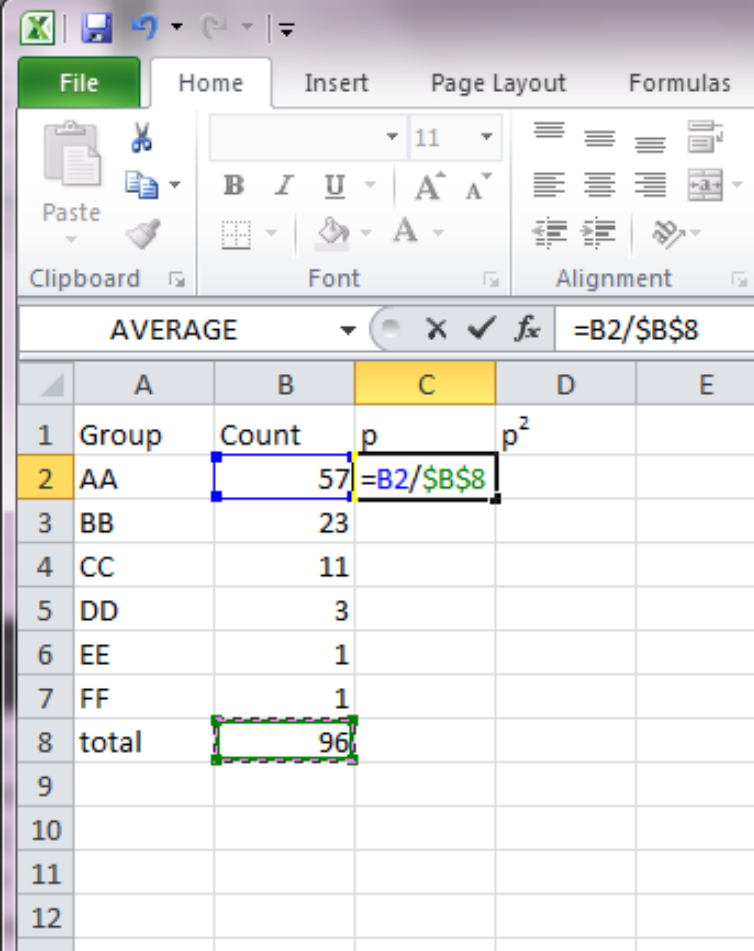
Natural Resource Biometrics

Now we sum the count data.

Figure 2. Sum the count data.

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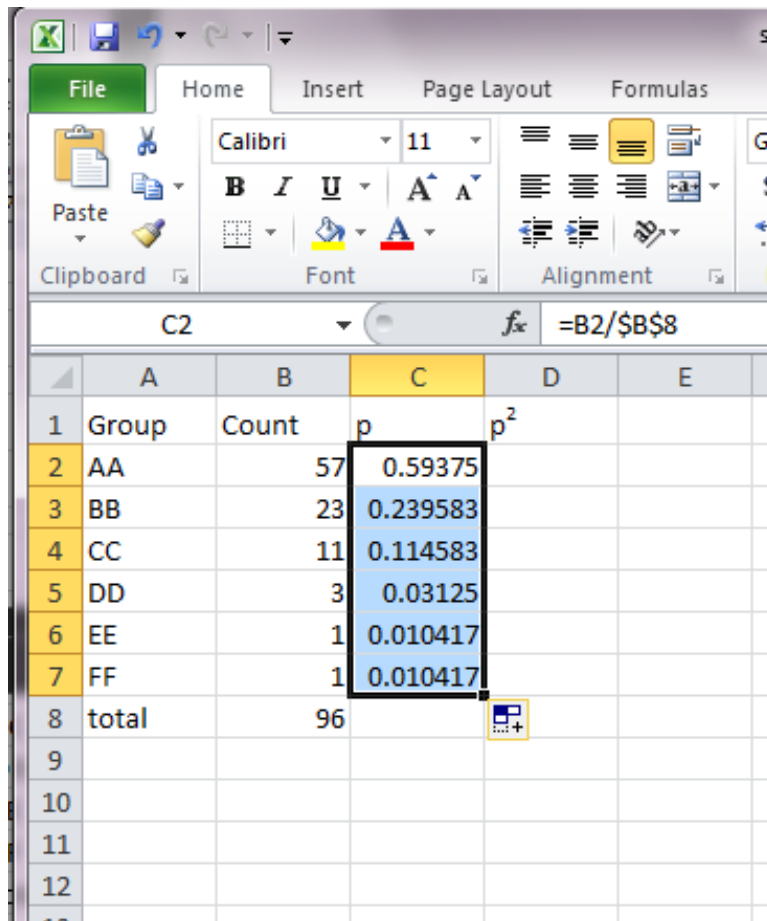Then we calculate the group propositions by dividing each count by the total

Figure 3. Calculate the proportions for each group.

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This is a view of the calculated proportions.

Figure 4. The calculated proportions.

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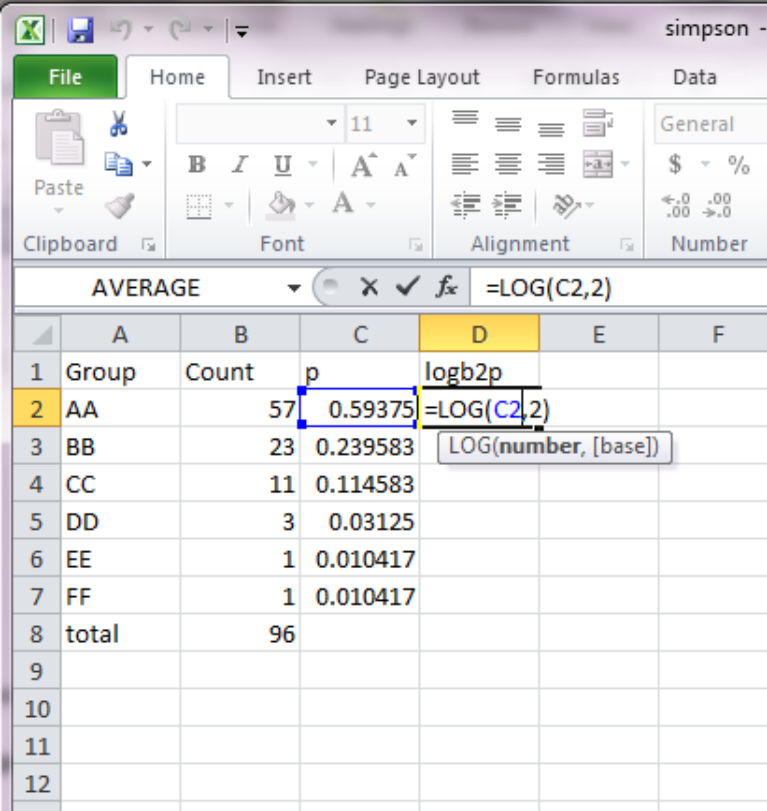
Figure 5 We now calculate the log of p to the base2

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Figure 6. We now that the absolute value of the sum of this column.

Natural Resource Biometrics
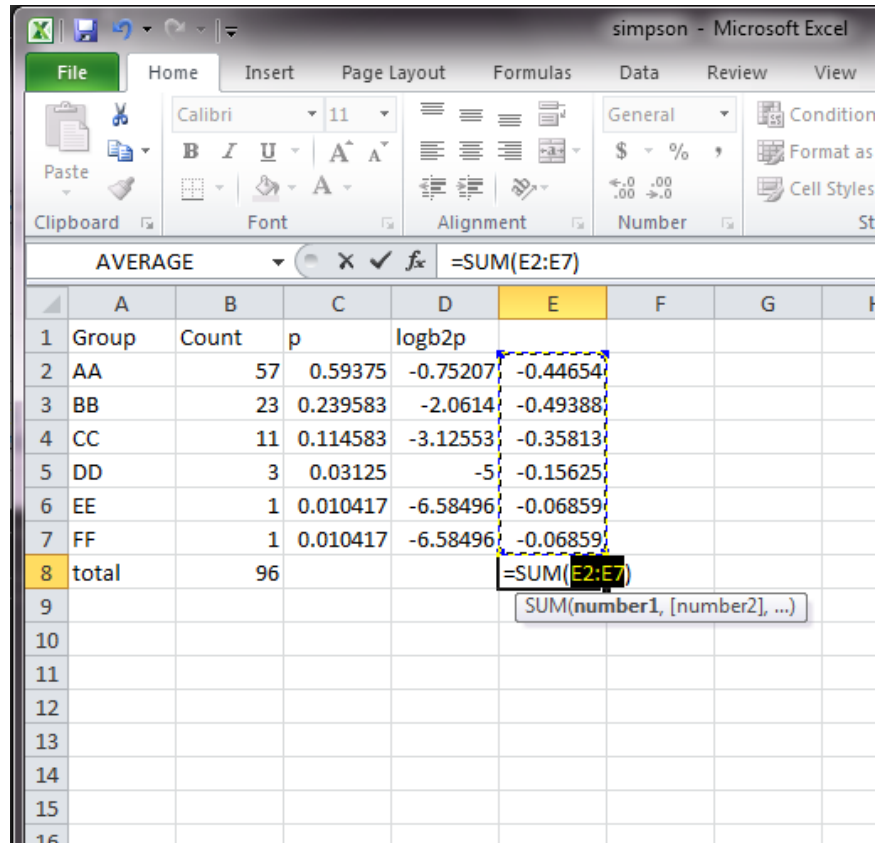

Figure 7

Programming the Function

I start with a shannon function from lesson 4.

- Accept a range of numbers as an argument returning a double number. (Note: the input data is count by category)
- Add appropriate comments.
- Determine the sum of the counts
- Divide each input number by the sum of the counts to get a proportion.
- Sum the squared proportions.
- Take the 1 - result.

- Return the answer as a number of type double.

During this these tutorials, I will give you short examples to help you learn the process. I will only give examples on items that are new please refer to previous lessons of steps already covered.

In a Module window type

```
Function shannon(data As Range) As Double
```

Please reuse your code from the mean example as the function is very similar.

In this function we need the total of the input counts. To do this we will need 2 For Loops

In the second For loop, replace the mean statement with the following statement after the prop variable is calculalted.

```
logprop = Math.Log(prop) / Math.Log(2)
```

this statement says a variable logprop equals the natural log of prop divided by the natural log of the number 2. This returns the natural log of x base 2 as described in the Shannon webpage. Also in the second For loop enter the following command.

```
sumprop = sumprop + (prop * logprop)
```

This statement says a variable sumprop equals the old value of sumprop + the prop value time the logprop value. Place the following statement outside the second For loop.

```
shannon = Math.Abs(sumprop)
```

this statement says that the new value of shannon equals the absolute value of shannon , just as we did in the spreadsheet.

Now remember that the variable Shannon is returned to the spreadsheet. My actual working code need only 10 line of instructions.

Now we will use the new shannon function.
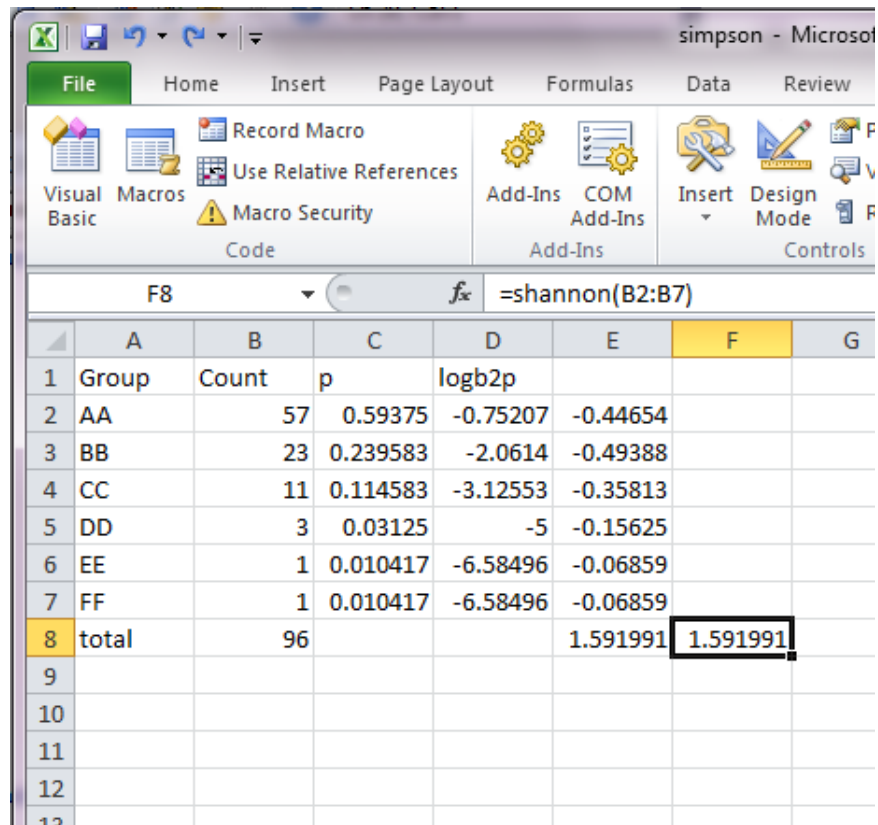

Figure 8

In this lesson we have learn:
•   Learn to program a Shannon's index function.
•   Learn some basic syntax.
•   Learn to take log in different bases.
•   Learn to use the absolute value function
•   Learn to run the function we just made.

Please write the shannon function the works. Copy and paste the VBA commands into a document be sure your name is in the comments and send that to the Blackboard drop box.