Assessment 2: Robinson - Birds v. Humans: Light and Noise

**Mindset to take this assessment in:**

Totally feel free to look up how to do things from the first three coding lessons or on Stack Exchange for ideas and help. Just remember to not work with each other on this one. You can also ask for help on general methods and clarification on instructions from me. I won't tell you how to do anything, but I may tell you what functions I would use. The purpose of this is to help you set up a "coding pipeline" that you can reuse for your own data analysis with a some of tweaking. I have included several lines of code in the Framework document. Do not delete them! You may get different answers if you delete or tweak them.

**Files you will need:**

-AbigailTestData (you should already have this)

-TestMetaData (it's in the coding materials on BrightSpace if you have not yet downloaded it)

-Coding\_Framework.R (also in coding materials)

**Overarching Goal**

Test the following hypotheses:

1) Urban Grasshopper Sparrows sing at significantly higher frequencies than Rural Grasshopper Sparrows.

2) Urban Chipping Sparrows sing at significantly higher frequencies than Rural Chipping Sparrows.

3) Urban Grasshopper Sparrows sing significantly earlier in the day than Rural Grasshopper Sparrows.

4) Urban Chipping Sparrows sing significantly earlier in the day than Rural Chipping Sparrows.

**Points Breakdown:**

**Good practices: 2 points**

You start with all 2 and lost by 1/2 increments for doing silly things. You will keep all points if you code is...

**Clean:** does what I asked you to do in an orderly way; does not do anything else.

**Works:** I don't have to modify your code to make it work, and I get no errors when running your code.

**Getting started: 1 point**

Load the two data files.

**House Keeping: 1 point**

Add the dummy data to the TestMetaData

**Rural/Urban Divide-Frequency: 7 points**

Break birds into two groups: rural birds and urban birds, depending on the amount of light produced where they were recorded, and test whether they have significantly different maximum syllable frequencies.

**Rural/Urban Divide-Timing: 7 points**

Using the groups made above, test whether birds were recorded in an urban environment began singing significantly earlier

**Correct for Multiple Testing: 1 point**

Use a Bonferroni correction to control for multiple testing.

**Plotting: 2 points**

Make 4 simple plots related to the hypotheses we tested above.

**Short Reponses: 4 points**

**1)** What were your results for the four hypotheses above? State whether there was a significant difference, the directionality of significant results (what was larger than what?,) and the p-value supporting your conclusion. (1 point)

**2)** Do you see any potential problems with using the recording time as a proxy for when birds began to sing in the morning? Think about what a birdwatcher/citizen scientist is and does and how that would relate to time and also take a close look at the time data. (2 points)

**3)** Justify the number of tests you corrected for in the "Correct for multiple testing" section and explain whether it changed any or your results. Any answer is technically correct as long as it stands on a solid logical foundation (see the reading I linked to in the Coding\_Framework.R or feel free to do your own research). (1 point)