CONSTELLATION MODEL DATA AND MAP

Introduction

You will build a three-dimensional scale model of a constellation next week. This week, you choose the constellation, gather the data you will need, and calculate the scale of your model.

Supplies

Computers to access constellation data, download the spreadsheet and make a spreadsheet for distances

Procedure

Choose a constellation

Write your name on the sign-up sheet after the name of an unclaimed constellation. Also write the name of the constellation you claimed after your name on the lab's sign-in sheet.

Download the map spreadsheet

1. From the Canvas assignment for the lab, or from the barransclass.com link, download the constellation spreadsheet.
2. Change its name to the name of your constellation.
3. Save the spreadsheet so that you can access it: save it to a thumb drive or your student account, or email it to yourself as an attachment, put it in the cloud; whatever works to make your own copy that you can access.

Get the data

4. Make a list of the visible stars in your constellation, along with their celestial coordinates (right ascension in hours, minutes, and seconds; declination in degrees, arc minutes, and arc seconds) and apparent magnitudes. Wikipedia is reliable source for this information.

Enter the data

5. Copy and paste the Wikipedia table into a new Excel spreadsheet. However, you will need to break the Right Ascension into separate numbers for hours, minutes, and seconds, and the Declination into separate numbers for degrees, minutes, and seconds.
6. Once you have the stars' names, coordinates, and apparent in the proper format, copy and paste it into the constellation map spreadsheet.
7. As you enter the star data into the constellation spreadsheet's "data" page, the spreadsheet plots a map of the constellation on its "StarMap" page. Unfortunately, I have not found a way to make Excel automatically write the star names by the stars, so it can be a challenge to figure out which circle on the plot represents which star. The best work-around I have found is to hold the cursor over one of the circles (stars) in the plot: soon, a little box will appear reporting its coordinates. These are the transformed (x, y) coordinates, not the star's celestial coordinates. Look back to the blue columns in the table and find the row with the coordinates matching the ones displayed. The name of the star will be in the first column of the row.

8. If the star map does not show the part of the constellation that you want to see, you can move it a little. This is accomplished by changing the entries in the "Nudge amt" and "Nudge dir" cells in the spreadsheet.

Plan the distances

9. The distance data are handled separately. Find the visible star at the greatest distance and scale the rest of your stars to it. Your model will be 14 ¾ inches long, so all of your stars will need to fit into that length. Make a table or create a spreadsheet to find the scale distances for your model.

Finishing Up

First: **Don't leave without checking in with your instructor!**

10. Show your instructor your star map. Verify that it shows the part of your constellation that you want to see.
11. Show your instructor the table of scale distances.
12. Use your printed star map (7 3/8" × 7 3/8") and table of distances to build the physical model.