

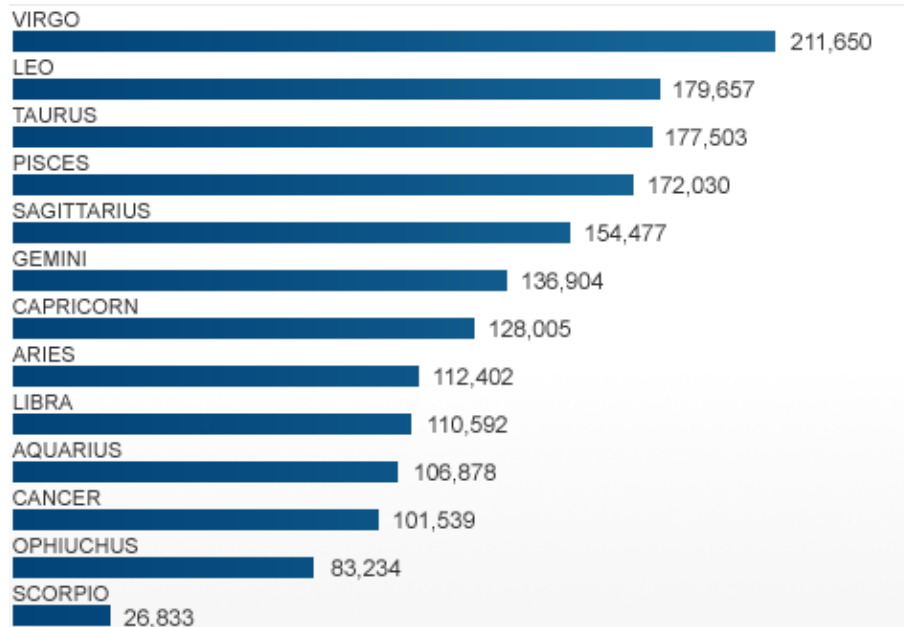
## Homework #2

Due at 5pm on Monday, September 18th

### Part 1 – Questions

*Please answer the following three questions on a separate sheet of paper. Write legibly or type your answers, and make sure your name is on each page.*

1. Explain in your own words why the north star's elevation for a given observer is equal to their latitude. A sketch will help here to support your argument, but a sketch alone will not suffice.
2. The figure below was released by Allstate Insurance Company in 2011 as a press release in response to a media rollout of the "new" zodiac signs (you can read about these new zodiac signs by googling "Horoscope Hang-Up: Earth Rotation Changes Zodiac Signs" and reading the article by that name). The figure shows the number of crashes in Allstate's 2010 records in which drivers of each Zodiac sign were involved.



- a. What does the chart imply? What story does it tell? Summarize its meaning in one sentence.
- b. What is your first reaction to this data? Are you surprised? Do you have any doubts about its validity?

3. Examine the table of information below, which includes the same crash information as the figure from question 2, plus two additional pieces to the puzzle: the birthdates and personality characteristics that correspond to each sign.

Sign	Birthdates	Personality Characteristics	Number of Drivers Involved in Accidents in 2010
Scorpio	Nov 23- Nov 28	Passionate, resourceful	26,833
Ophiuchus	Nov 29 – Dec 17	Wise, ambitious, lucky	83,234
Cancer	July 21 – Aug 9	Compassion, sensitivity	101,539
Aquarius	Feb 16 – March 11	Progressive, independent	106,878
Libra	Oct 31 – Nov 22	Cooperative, gracious	110,592
Aries	Apr 17 – May 13	Impatient, determined	112,402
Capricorn	Jan 18 – Feb 15	Responsible, disciplined	128,005
Gemini	June 20 – July 20	Short attention span, nervous	136,904
Sagittarius	Dec 18 – Jan 17	Impatient, idealistic	154,477
Pisces	March 12 – April 16	Fearful, overly trusting	172,030
Taurus	May 14 – June 19	Uncompromising, possessive	177,503
Leo	Aug 10 – Sept 15	Arrogant, inflexible	179,657
Virgo	Sept 16 – Oct 30	Worried, shy	211,650

- Explain why the personality characteristics associated with each sign can't explain the car crash data **using specific counterexamples from the table above**.
- Do the birthdates explain the crash data? Why or why not?
- If you were to add one column to the table above that would explain why zodiac sign is correlated with car crashes, what would it be? Add it to the table.

## Part 2 – Mastering Astronomy

Please complete this part through the course Moodle page. It's due at the same time as the rest of the assignment.

## Part 3 – Checking in

Answer this portion on the same sheet of paper as Part 1.

- What was the most interesting concept that you learned in class last week?
- What was the most difficult concept that you learned in class last week? What is still confusing about it?

## Part 4 - Observing

*Note that this section will always be graded by a separate TA from Parts 1-3. As such, please hand the two sections in separately (not stapled together) and make sure your name is on both.*

September is still a great time to see the asterism called “The Summer Triangle”, which consists of the three brightest stars in the constellations Vega, Cygnus and Aquila. For the observing portion of this assignment, you need to observe this asterism twice, from two different locations on campus.

Begin by observing the summer triangle from a well-lit location on campus (in the middle of the quad, outside the dining hall, etc.). Start by sketching the orientation of the three bright stars (Vega, Altair and Deneb) that make up the summer triangle relative to the horizon and labeling the stars. Then, sketch in any of the other stars you can see that make up the three constellations in which those stars reside (Lyra, Aquila and Cygnus). Before leaving, use fist and finger measurements to measure the distances between the three bright stars (the three sides of the triangle) and record them in the margins of your sheet (e.g. Vega – Altair = two fists (10x2) and three fingers (3x1) = 23 deg).

Repeat this process at the darkest safe location that you can find on campus (for this and all other observations, please bring a friend along and be safe). Challenge yourself to find and sketch not only all of the stars (including the faint ones) in the constellations, but also the milky way, which runs right through the summer triangle.

For both observations, record your location, the date and time, which direction you were facing (label this along the horizon that you sketch) and the conditions (Moon out? If so, how close to where you’re observing? Windy? Partially cloudy?) on your paper.

Once you’ve completed the two observations, write one paragraph noting the differences between them. How many more stars did you see at the dark location? Was it easier or harder to find the summer triangle and accompanying constellations in the dark location? Did you notice anything else that was different? Were you pretty consistent in the general shapes that you sketched?