HOMEWORK 1 SOLUTIONS - 65 total points

1 Math Refresher

SOME HELPFUL RULES

$$\begin{array}{ll}
\sqrt{x+y} \neq \sqrt{x} + \sqrt{y} & x_{i} \text{ where } i = 1, 2, 3 \text{ means } x_{1}, x_{2}, x_{3} \\
\frac{3}{x+y} \neq \frac{3}{x} + \frac{3}{y} & \sum_{i=1}^{3} x_{i} = x_{1} + x_{2} + x_{3} \\
\frac{x+y}{3} = \frac{x}{3} + \frac{y}{3} & x_{(i)} \text{ are ordered: } x_{(1)} \leq x_{(2)} \leq x_{(3)} \\
\sqrt{\frac{x^{2}}{y}} = \frac{x}{\sqrt{y}} & \sum_{i=1}^{3} (x_{i} - 3)^{2} \neq \sum_{i=1}^{3} (x_{i})^{2} + \sum_{i=1}^{3} 3^{2} \\
(-x)^{2} = x^{2} & \sum_{i=1}^{3} (x_{i} - 3)^{2} \neq \sum_{i=1}^{3} ((x_{i} - 3)(x_{i} - 3))) \\
-(x)^{2} = -(x^{2}) & \sum_{i=1}^{3} x_{i}y_{i} \neq \sum_{i=1}^{3} x_{i}\sum_{i=1}^{3} y_{i} \\
|-x| = x & \sum_{i=1}^{3} x_{i}y_{i} = x_{1}y_{1} + x_{2}y_{2} + x_{3}y_{3} \\
-|x| = -x & n! = (n)(n-1)(n-2)...(2)(1) \\
\binom{n}{k} = \frac{n!}{(k)!(n-k)!}
\end{array}$$

a. $\sqrt{\frac{9}{4}} = \frac{\sqrt{9}}{\sqrt{4}} = \frac{3}{2} = 1.5$

b. Solve this equation for b: $\frac{a}{n} = y + \frac{b}{n}x$

multiply by
$$n \to a = yn + bx$$

 $\to a - yn = bx$
 $\to \frac{a - yn}{x} = b$

c.
$$-(-11)^2 = -(11^2) = -(121) = -121$$

d.
$$\sqrt{\frac{32}{n} + \frac{17}{n}} = \sqrt{\frac{32+17}{n}} = \sqrt{\frac{49}{n}} = \frac{\sqrt{49}}{\sqrt{n}} = \frac{7}{\sqrt{n}}$$

2 Questions about the syllabus

- a. Where is my office and when are my office hours? Blocker 404E, Tuesdays 11-1 and Wednesdays 4-5
- b. What should you do if you know you will miss class when a homework is due? turn it in before class either in my office (if no one's there put it under the door) or give it to me in the class before it's due
- c. What letter grade is 89.4446%? A
- d. Are there any circumstances that allow turning in homework late? only with a university excused absence
- e. If your homework assignment consists of multiple sheets of paper what must you do before turning it in (or else loose points on the assignment)? staple it

3 Lecture 1 material

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a. Make a stemplot using the variable weight for the first 10 individuals from the BRFSS found in Lecture 1.

values \rightarrow 175, 125, 105, 132, 150, 114, 194, 170, 150, 180 ordered \rightarrow 105, 114, 125, 132, 150, 150, 170, 175, 180, 194

frequency	stem	leaf
1	10	5
1	11	4
1	12	5
1	13	2
0	14	
2	15	00
0	16	
2	17	05
1	18	0
1	19	4

b. Do exercises 1.2, 1.7, 1.9 in the textbook

1.2: individuals = students

 $variables = name (categorical \rightarrow nominal), major (categorical \rightarrow nominal), points (quantitative \rightarrow continuou grade (categorical \rightarrow ordinal))$

1.7			
	1992	2002	
miles driven	2247 billion = 22470 hundred million	2830 billion = 28300	
traffic deaths	39250	4281	
rate (deaths per hundred million miles)	39250/22470 = 1.75	42815/28300	

So, the rate of death occuring per hundred million mile is higher in 1992 than in 2002.

1.9



