

# Homework 1: Sections 1.1 - 1.2

## KEY

STA209-04: Applied Statistics

January 25, 2019

**Total Possible Points: 21**

### From the Book:

1.11) [3 pts]

- a) [1 pts] *Year* is categorical, *Height* is quantitative, *Weight* is quantitative, *Siblings* is quantitative, *VerbalSAT* is quantitative, *MathSAT* is quantitative, *SAT* is quantitative, and *HigherSAT* is categorical.
- b) [1 pts] Any reasonable questions are acceptable. Some examples may be, "How many first year students are there?" and "What is the highest Verbal SAT score?"
- c) [1 pts] Any reasonable questions are acceptable. Some examples may be, "Do student with more siblings score higher on the SAT?" and "Which year of students had the highest Math SAT scores?"

1.20) [3 pts]

- a) [1 pts] First study: the cases are North Carolina university students, and the variables are whether the student had smoked a hookah at least once (categorical) and whether hookah smoke was safer than cigarette smoke (categorical).
- b) [1 pts] Second study: the cases were the people at the hookah bar, and the variables were length of hookah session (quantitative), frequency of puffing (quantitative), and depth of inhalation (quantitative).
- c) [1 pts] Third study: the cases were samples of hookah smoke, and the variables were the amount of tar, nictone, and heavy metals (all quantitative) in each sample.

1.36) [3 pts]

- a) [1 pts] The sample is the 100 college students surveyed.
- b) [1 pts] The population of interest is Americans.
- c) [1 pts] We can generalize our sample to American college students.

1.55) [6 pts]

- a) [3 pts] The cases are people who used public restrooms in Turner's Field, Penn Station, Grand Central Station, the Museum of Science and Industry, the Shedd Aquarium in Chicago, and the Ferry Terminal Farmers Market. The variables are sex (categorical), whether the subject washed their hands (categorical), and location (categorical).
- b) [3 pts] This is an example of social desirability bias. Given the negative perceptions associated with not washing one's hands, people are less likely to admit when they do not wash their hands.

1.59) [6 pts]

- a) **[3 pts]** This is not a simple random sample from a target population. The survey was not selective or compulsory, but rather voluntary and open to all individuals who browse Facebook and/or Twitter. People who are friends with or followers of Dr. Myrick would be more likely to see the survey and people who enjoy cat videos/photos are most likely to participate.
- b) **[3 pts]** Any response, so long as it is sufficiently explained and reasonable, is acceptable. An example response might be confirmation bias. People who complete the survey are more likely to enjoy cat videos/photos and believe that they influence their mood. Another way that this might be biased would be through the survey-link sharing mechanism. People passionate about cat videos (one way or the other) are probably more likely to share the survey.