

MATH 1150 Quiz 1

Name: Solutions

Term: Spring 2018

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All problems are 2 points each. Ten randomly selected U.S. adults were surveyed and asked their age, whether they live in a rural, suburban, or urban area, and whether they have used a rideshare app like Uber or Lyft in the last 6 months. The collected dataset is given below:

Person	Age	Home Area	Rideshare?
A	19	Urban	Yes
B	41	Suburban	Yes
C	68	Rural	No
D	29	Suburban	Yes
E	34	Urban	Yes
F	55	Urban	No
G	61	Urban	Yes
H	28	Suburban	Yes
I	37	Suburban	No
J	23	Rural	No

(1) How many cases are there in this dataset? How many variables?

Cases: 10 variables: 3

(2) Which of the variables are categorical? Which are quantitative?

Cat: home area, ride share? quant: age

(3) Is this an experiment or an observational study? Why?

Observational Study, since the researcher did not control any of the variables

For questions 4 and 5, suppose we were trying to address the question "Amongst adults in the U.S., are younger people more likely to use ridesharing apps?"

(4) What is the population? What is the sample?

pop: all US adults sample: 10 people surveyed

(5) What is the explanatory variable? What is the response variable?

exp: age response: rideshare?

- (6) In the collected sample, what is the proportion of individuals that live in a suburban area? Use the notation for this sample proportion that we discussed in class.

$$\hat{p} = \frac{4}{10} = 40\%$$

- (7) Make a two-way table for the rideshare and home area variables.

	Y	N	total
rural	0	2	2
sub	3	1	4
urban	3	1	4
total	6	4	

- (8) In the sample, what proportion of urban dwellers are rideshare users? What proportion of rideshare users are urban dwellers?

(a) $\frac{3}{4} = 75\%$

(b) $\frac{3}{6} = 50\%$

- (9) Determine the mean and median for the ages collected in the sample. For the sample mean, use the notation we discussed in class (you don't need any notation for the median).

mean: $\bar{x} = \frac{19+41+\dots+23}{10} = 39.5$

median: 19 23 28 29 34 37 41 55 61 68

35.5

- (10) Amongst all people (not just adults) in the world, would you expect the distribution of age to be skewed left, skewed right, symmetric, or none of these? Explain your answer.

I would expect a skew right. While the worldwide birth rate is currently on a decline, it hasn't been for long, and mortality causes a decline in population for higher ages. I would guess

a shape like



but I'll take any answer with sound reasoning.