

Name Jerry
Student Number _____

STA 441 S2020 Quiz 1

1. (3 Points) Make up an original example of an *experimental* study with one categorical explanatory variable and one categorical response variable. Clearly indicate

- What the cases are.
- Which variable is explanatory.
- Which variable is response.
- Why the study is experimental rather than observational.

You have a lot more room than you need for a good answer.

Visitors to a website randomly see either Advertisement A or Advertisement B. Whether or not they purchase the product is recorded.

- The cases are visitors to the website.
- The explanatory variable is Ad A vs B.
- The response variable is purchase: Yes vs No.
- The study is experimental because of random assignment to advertisement.

I would suggest one mark off for wrong or missing

- Categorical Explanatory	- Each bullet point
- Categorical Response	
- Experimental	

They add to more than 3, but zero is the lowest possible mark.

2. (3 Points) Label each statement below True or False. Write "T" or "F" beside each statement. You must get at least 6 out of 8 correct in order to get credit for this question.
- (a) T In an experimental study, a statistically significant relationship between the explanatory variable and the response variable can provide some evidence of cause and effect if the study is well controlled.
 - (b) F The p -value is the probability that the null hypothesis is true.
 - (c) T We observe $r = -0.70$, $p = .009$. We conclude that high values of X tend to go with low values of Y and low values of X tend to go with high values of Y .
 - (d) F If $p < .05$ we say the results are statistically significant at the .05 level, and we do not have sufficient evidence to conclude that the explanatory variable and the response variable are related in the population.
 - (e) F It is impossible for the explanatory variable and the response variable to be unrelated in the sample, but related in the population.
 - (f) F The greater the p -value, the stronger the evidence that the explanatory and response variable are related.
 - (g) F An observational study is one in which cases are randomly assigned to the different values of an explanatory variable.
 - (h) F When a relationship between the explanatory variable and the response variable is *not* statistically significant, we conclude there is no relationship between the two variables in the population.

3. This question is based on the `statclass` data (Question 23 of Assignment 1).

- (a) (2 points) What percentage of students were female? The answer is a number from your printout. Write the number in the space below. **On your printout, circle the number and write "Question 3a" beside it**

37.93%

- (b) (2 points) What was the mean score on the midterm test? The answer is a number from your printout. Write the number in the space below. **On your printout, circle the number and write "Question 3b" beside it**

68.9

Please attach your log file and your output (results) file to the quiz paper. Make sure your name and student number are written on both printouts.

```

1      OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;
68
69      /***** 441f24HW1statclass.sas *****/
70      title 'STA441 Assignment 1 Check';
71      title2 'Little Stat Class Data';
72
73      data stats;
74          infile '/home/u1407221/441s24/Assignments/A1/LittleStatClassData2b.txt';
75          input  ID sex $ race $ quizave compave midterm final;
76

```

NOTE: The infile '/home/u1407221/441s24/Assignments/A1/LittleStatClassData2b.txt' is:
 Filename=/home/u1407221/441s24/Assignments/A1/LittleStatClassData2b.txt,
 Owner Name=u1407221,Group Name=oda,
 Access Permission=-rw-r--r--,
 Last Modified=23Dec2023:13:55:55,
 File Size (bytes)=3132

NOTE: 58 records were read from the infile '/home/u1407221/441s24/Assignments/A1/LittleStatClassData2b.txt'.
 The minimum record length was 53.
 The maximum record length was 53.

NOTE: The data set WORK.STATS has 58 observations and 7 variables.

NOTE: DATA statement used (Total process time):

real time	0.00 seconds
user cpu time	0.00 seconds
system cpu time	0.00 seconds
memory	757.53k
OS Memory	20132.00k
Timestamp	12/23/2023 07:05:53 PM
Step Count	32 Switch Count 2
Page Faults	0
Page Reclaims	151
Page Swaps	0
Voluntary Context Switches	15
Involuntary Context Switches	0
Block Input Operations	0
Block Output Operations	264

```

77      proc freq;
78          tables sex race;
79

```

NOTE: There were 58 observations read from the data set WORK.STATS.

NOTE: PROCEDURE FREQ used (Total process time):

real time	0.01 seconds
user cpu time	0.02 seconds
system cpu time	0.00 seconds
memory	1701.59k
OS Memory	21416.00k
Timestamp	12/23/2023 07:05:53 PM
Step Count	33 Switch Count 2
Page Faults	0
Page Reclaims	601
Page Swaps	0
Voluntary Context Switches	12
Involuntary Context Switches	0
Block Input Operations	0
Block Output Operations	272

```

80      proc means;
81          var quizave compave midterm final;
82
83      run;

```

NOTE: There were 58 observations read from the data set WORK.STATS.

NOTE: PROCEDURE MEANS used (Total process time):

real time	0.02 seconds
user cpu time	0.02 seconds
system cpu time	0.00 seconds
memory	6554.40k
OS Memory	27320.00k
Timestamp	12/23/2023 07:05:53 PM
Step Count	34
Switch Count	1
Page Faults	0
Page Reclaims	1579
Page Swaps	0
Voluntary Context Switches	21
Involuntary Context Switches	0
Block Input Operations	0
Block Output Operations	0

84

85 OPTIONS NONOTES NOSTIMER NOSOURCE NOSYNTAXCHECK;

95

STA441 Assignment 1 Check
Little Stat Class Data

The FREQ Procedure

sex	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Female	22	37.93	22	37.93
Male	36	62.07	58	100.00

Question 3a

race	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	37	63.79	37	63.79
B	15	25.86	52	89.66
C	6	10.34	58	100.00

STA441 Assignment 1 Check
Little Stat Class Data

The MEANS Procedure

Variable	N	Mean	Std Dev	Minimum	Maximum
quizave	58	7.2568966	1.0972233	4.6000000	9.6000000
compave	58	8.4000000	1.1607620	4.6000000	9.9000000
midterm	58	68.8793103	14.9456062	10.0000000	95.0000000
final	58	49.4482759	16.5159916	15.0000000	87.0000000

Question 3b