

STATISTICS 641 - ASSIGNMENT 1

DUE DATE: 11:59pm (CDT), WEDNESDAY, September 8, 2021

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Please TYPE your name and email address. Often we have difficulty in reading the handwritten names and email addresses. Make this cover sheet the first page of your Solutions.

STAT 641 H.W. 1: Due 9/8/2021

- 1.) There were two major problems in the initial analysis of O-ring failures data:

- ① The analysts did not use all the data they had available to them. Specifically, they did not include, in their graphs, the temps for launches in which there were no O-ring failures.
- ② An extrapolation was required as the launch temp of 31°F was outside the range of previous launch temps.

- 2.) One of the most common misrepresentations of statistical findings is concluding that correlation means causation. In other words, finding a statistically significant relationship between two variables and concluding that a change in the explanatory variable causes a change in the response variable.

- 3.) Study 1: (i) Experimental, (ii) comparative, (iii) RV - Heart Disease EV - Diet

Study 2: (i) observational, (ii) descriptive

Study 3: (i) observational, (ii) descriptive

Study 4: (i) observational, (ii) comparative, (iii) RV - Baby Weight EV - Δ mother weight during pregnancy.

- 4.) a.) Systematic Sampling.

b.) Simple Random Sample

c.) Stratified Random sampling

d.) Stratified multi-stage cluster sampling

- 5.) a.) (i) survey, (ii) descriptive

b.) (i) retrospective, (ii) comparative, (iii) EVs - Age, # pregnancies, smoke during pregnancy, ^{RV - Prem}

c.) (i) survey, (ii) descriptive

d.) (i) retrospective, (ii) descriptive

6.) a.) Done in \mathbb{R}^+

b.) $S(0)$ - most

0 - least

7.) C. stratified b/c we are dividing the USA into different regions (or states)
The power plants represent our clusters. Random b/c we randomly selected the power plants.

8.) D First cluster is the 100 counties which were randomly selected. Second cluster is the doctors.

9.) B stratified b/c we divided East Texas into 35 regions (our states). Each of the 15 trees in the region is a cluster where multiple measurements are taken on each of the damaged birds.

10.) C stratified b/c we are dividing the coast of Texas into its 25 counties (the states)
random b/c we are randomly sampling 50 horses from each county.