

Due Friday 11:59pm March 05, 2021

You may use MINITAB, SAS, R, Web Applets, etc. ... please provide the output to support and justify your answers; when appropriate.

Please make the write-up: organized, presentable, etc.

PROBLEMS or QUESTIONS: SEE THE INSTRUCTOR IMMEDIATELY.

You may use textbooks, notes from this class, computer packages,
BUT you are not to consult other individuals, except the instructor.

=====

Whenever possible data-sets should be analyzed using
descriptive techniques (both graphical and numerical).

All analyses (testing, confidence intervals, etc.)
should have conclusions/interpretations worded in terms of the problem.

Reject H_0 or (1.2, 5.3) is not a sufficient
conclusion what do these things mean; answer the question of interest, etc.

=====

1) [10 PTS]

page 1008 #'s 15.35, 15.36 DATASET = [ex15-35.txt](#)

2) [10 PTS]

pages 1004 # 15.26

3) [10 PTS]

pages 1004-1005 # 15.27

4) [10 PTS]

page 997 # 15.13

5) [10 PTS]

pages 936-937 #'s 14.8, 14.9, 14.10 DATASET = [ex14-8.txt](#)

6) [15 PTS]

An experiment has been performed to determine the power requirements for cutting metal with ceramic tools. The metal was cut on a lathe and the vertical component of a dynamometric reading recorded. This component is proportional to the horsepower requirements in making the cut and is measured in millimeters of deflection.

The lathe investigated allowed for the examination of two factors with only the following levels:

angle of edge bevel: 15 degrees or 30 degrees

type of cut: continuous or interrupted

Nine pieces of metal were available for the experiment. Since it was expected that these metal pieces were not homogeneous, each was cut by each of the four possible combinations of the two factors.

DATASET = [lathe.txt](#)

COMPLETE A FULL AND APPROPRIATE ANALYSIS

{... identify the design, propose a model, conduct statistical inference, {perform residual analysis, recommendation of a treatment, ..., etc.

7) [10 PTS]

A watermelon breeder has been assigned a field which has a north-south moisture gradient and soil type differences from east-to-west. The breeder feels that it will be necessary to control both extraneous sources of variation. She wants to know how the experiment should be designed.

What type of experimental design should she use?

Are there any concerns about the number of treatments

she can investigate using the experimental design you suggested?

She will use your design to investigate 6 new varieties of watermelon.

... provide her with a sketch of the anova table [sources, df]

Her Center Director, noting that no "control" variety has been included, requests that the current recommended variety for the region be added to the experiment. She is upset and comes to you for help. Any ideas/suggestions?

8) [10 PTS]

page 941 #'s 14.20, 14.21 DATASET = [ex14-20.txt](#)

9) [15 PTS]

Miles Per Gallon:

An automobile manufacturer wished to study the effects of differences between drivers (factor A) and differences between cars (factor B) on gasoline consumption. Four drivers were selected at random; also, five cars of the same model with manual transmission were random selected from the assembly line. Each driver drove each car twice over a 40-mile test course and the miles per gallon were recorded. DATASET = [MPG.txt](#)

Write an appropriate linear statistical model.
Identify all terms in the model.
Give Expected Mean Squares.

Test whether or not the two factors interact.

Test for factor A and factor B main effects.

Obtain point estimates and interval estimates for ALL of the variance components ... Which components appear to have the greater effect on gasoline consumption?