Stat414; FALL 2024; Assessment Instructions

INSTRUCTIONS

I. You are expected to work on the assessments without the help of the discussion threads. You are expected to work on the assessments by yourself without any outside human or internet help. You will be signing an honor code to this effect.

II. Each assessment is based on two or three modules. Questions are based on the material supplied in the module folders. You may consult these materials while answering the questions.

III. You may have to use R (Rstudio plus any other package needed). R output along with the screenshot of your R session should be included in your submission.

IV. Once you open the submission link, you will have one hour to complete the assessment. Unlimited attempts are enabled. Please submit after completing each question. Your last attempt uploaded, containing ALL your completed work will be graded. (Only one upload per student to be graded by the grader)

V. You need to submit

- .pdf of this document including the CHECKLIST and SCORE tables.
- .Rmd file showing all your codes
- .pdf file showing the report generated by your .Rmd file
- .RData file which saves all commands and clicks of your session
- a video log of your entire session. Here's are three short videos showing exactly how to do this, along with your own face showing in the corner throughout the session. Click on the Zoom support link below if you are looking for more techincal details on how to do this.

  `https://youtu.be/Le216n4lNhw`

  `https://youtu.be/LfQYZ_3gCb4`

  `https://youtu.be/MLyW0JVlT98`

  Zoom Support for Local Recording

Stat414; FALL 2024; Assessment 03 ; 100 Points;

CHECKLIST

Item	Points	Included?
.Rmd	Your Code	
.pdf	Your output	
.RData	Your R session	
.mp4	Your Assessment session	

SCORE

Question	Points	check
Q1a	20	
Q1b	20	
Q1c	20	
Q2a	20	
Q2b	20	
Total	100	

1. Consider the copper data provided in the package `EnvStats` in the data frame `EPA.92c.copper1.df`.

   (a) Create a normal probability plot by combining the data from both background wells to determine whether these data may be adequately modeled with a normal distribution.

   (b) Assume there is no substantial spatial or temporal variability in the copper concentrations. Also, assume the data at the compliance well will be tested monthly, and use the background well data to create a one-sided upper 95% prediction interval for the next k = 6 future observations, and compare the data from the compliance well to the upper prediction limit. Is there any evidence of contamination based on this method?

   (c) Compute a one-sided upper 95% β-content tolerance interval with associated confidence level 95% based on the background data, and compare the data from the compliance well with the upper tolerance limit.

2. Continuing with the copper concentration data analysis from # above:

   (a) Plot the compliance well data vs. time, and add a horizontal line at the upper prediction limit to the plot. Add a horizontal line at the upper simultaneous prediction limit to the plot you created in part c above. Add a horizontal line at the upper tolerance limit to the plot you created in part c above.

   (b) Explain the difference between the upper prediction limit, the upper simultaneous prediction limit, and the upper tolerance limit. What does each limit assume?