PSC 103B

Homework 4

Winter 2025

**Instructions**

Please use R/RStudio to complete the following questions. You will submit your filled-out version of this document **as a PDF** on Canvas. Make sure your PDF looks as expected before submitting. Unless otherwise specified, please **always** **include the code you used to generate your answer for each question, or the steps you used to calculate the answer (when relevant), as well as the final answer and/or relevant output** (output is what comes out in the console when you run an R command, e.g., the results of the model when you run summary(fit1)).It’s a good idea to organize your R code in the R script and save it, so if you need to modify or recalculate one of the questions, that’s easy to do (see the R scripts provided in previous weeks for tips on how to organize your code). If you copy and paste code or output into this document (screenshots are also acceptable), **please format the code and output using a fixed-width font** (e.g., Courier) so it’s easier to read.

You may consult with your classmates while working on the assignment, but **you must do all the work yourself – everything you turn in must be your own code and words**. Academic dishonesty will not be tolerated.

Please submit **a pdf version of this document** with your answers on Canvas by **4:00pm on Thursday, February 13.**

**The Data**

We will be continuing to use the NPAS Dataset from the past 2 weeks (sorry if you’re sick of this dataset by now!). Here is a refresher of the relevant variables for this homework assignment:

* continent: The continent that the participant is from, out of 5 possible options: Africa, Americas, Asia, Europe, and Oceania
* TIPI1: Participant’s self-rated extraversion (on a scale of 1 to 7)
* nerdy\_selfreport: Participant’s self-rated nerdiness level (on a scale of 1 to 7)

**Question 1**

Suppose you met someone from Europe who had just finished a tour of the Americas, who remarked that all the people they had met seemed so much more extraverted than the people they knew back in Europe. Luckily, you have this dataset where you can check and see whether your new friend’s impression is right or not!

State the null and alternative hypothesis for this test (1 point).

**Question 2**

Report the mean extraversion score for participants from the Americas and the mean extraversion score for participants from Europe. Show your code. (1 point)

**Question 3**

Conduct a t-test to for the hypotheses above. Show your code and output. (2 points)

**Question 4**

What is your conclusion? Is your friend’s impression of people from the Americas correct? (1 point)

**Question 5**

This got you thinking – are there perhaps continental differences in how people perceive themselves? Perhaps people from different continents think they are more or less nerdy than people from other continents. You decide to conduct a one-way ANOVA to see whether this is true, and there is a difference in self-reported nerdiness across continents.

Write the null and alternative hypotheses for this test. (1 point)

**Question 6**

Calculate and report the mean self-reported nerdiness score for each continent. Show your code. (2 points)

**Question 7**

Conduct the one-way ANOVA. Show your code and output. (2 points)

**Question 8**

What can you conclude about the average self-reported nerdiness across continents? Is there a difference? (1 point)

**Question 9**

Can the results of the one-way ANOVA tell you which continents have significantly different self-reported nerdiness scores from each other? Why or why not? (1 point)