DSCI401 - Homework 1

Due: September 15, 2024

Homework should be submitted as an R Quarto file with links to Google colab notes where necessary. Homework should be turned in on Sakai.

1. (20 points) Set up a github account and create a repository called DSCI401. Clone this repo into RStudio: https://github.com/menawhalen/DSCI_401

2. (40 points) Create an R Quarto file and answer the following problems:

   (a) Create a numeric vector containing the values 5, 10, 15, 20, and 25. Calculate the mean of this vector and assign it to a variable called ‘mean_value‘. Print the ‘mean_value‘

   (b) Create a data frame with the following information about a few of your friends:

   - Name (character)
   - Age (numeric)
   - Favorite Color (character)

   Make sure to include at least 5 rows of data. Establish proper class types of each variable. Print the entire data frame. Name it whatever you like.

   (c) Create two numeric vectors: ‘vector1‘ with values 1 to 20 and ‘vector2‘ with a sequence from 1 to 40 by 2. Perform the following operations:

   - Add ‘vector1‘ and ‘vector2‘ and store the result in a new vector called ‘sum_vector.‘
   - Subtract ‘vector2‘ from ‘vector1‘ and store the result in a new vector called ‘diff_vector.‘
   - Multiply ‘vector1‘ and ‘vector2‘ element-wise and store the result in a new vector called ‘prod_vector.‘
   - Divide ‘vector1‘ by ‘vector2‘ element-wise and store the result in a new vector called ‘quot_vector.‘

   Print all four result vectors.

   (d) Write a function in R called ‘convert_temperature()‘ that takes two arguments:

   - temp (a numeric value) – the temperature to convert.
   - unit (a character string) – either "C" for Celsius or "F" for Fahrenheit, representing the target unit of conversion.

   For invalid input (i.e., if unit is neither "C" nor "F"), the function should return a message indicating an error.

3. (40 points) Create a google colab notebook. Run the following code and answer the same question as above using python.

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   (b) Create a data frame with the following information about a few of your friends:

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