This document needs to be saved to your Root Folder.

**Class Project**

The ***Class Project*** is the only assignment that you will be evaluated on in this class. The purpose of the ***Class Project*** is to apply the skills you learn in class to your own dataset(s) and variables. If you do not have a dataset, you can find one online (just google "R datasets"). There are many freely available datasets online [including hundreds at this website](https://vincentarelbundock.github.io/Rdatasets/datasets.html). You can use multiple script files in the project.

***To pass the class*** you need to:

1. Meet all the requirements in ***Table 1: Project Requirements Table***.
2. Earn 75% of the points in the ***Table 2: Skill List***.

Class Project submissions are sent to the instructor ([belinsky@msu.edu](mailto:belinsky@msu.edu)). The submission needs to include:

1. This document with the ***Table 2: Skill List*** filled out
2. All R script files used in your project
3. All data files used in your project
4. A list of R packages you used in your project (if any)

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| --- | --- |
| ***Table 1: Project Requirements*** | **Lesson** |
| 1. Script is well commented | 1.1 |
| 1. Use semicolons ( ; ) to end commands throughout your scripts. | 1.1 |
| 1. Consistent alignment of curly bracket ( **{ }** ) | 1.7 |
| 1. Give a brief (1-2 sentences) description in the ***Description*** column of ***Table 2*** for each skill you used. |  |
| 1. Skills completed in ***Table 2*** are commented in your script file where the skill is demonstrated.   The comment should be # SKILL XX where XX is the skill number in ***Table 2***. |  |
| 1. Script lines have no text beyond the 80th character with exception of:   1) long file names (these cannot be broken down)  2) SKILL XX comments | 1.6 |

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| ***Table 2: Skills List*** (you can use the same line(s) of code to satisfy multiple skills) | **Lesson** | **Max**  **Points** | **Your Points** | **Description** (1-2 sentences and make sure you adjust the points in the ***Your Points*** column) |
| 1. Use of a standard mathematical operations (+, -, \*, /). *Half-point per use/ max of 1 point.* | 1.3 | 1 | 0 |  |
| 1. Using parentheses to order mathematical operations | 1.3 | 1 | 0 |  |
| 1. Using powers or roots | 1.3 | 1 | 0 |  |
| 1. Get input from user and save the input to a variable | 1.5 | 1 | 0 |  |
| 1. Output mixed message (variables and text) to Console Window | 1.6 | 1 | 0 |  |
| 1. Use of line feed (newline) character | 1.6 | 1 | 0 |  |
| 1. Use of different conditional operators.   *Half point for each unique operator (6 in all).* | 1.7 | 3 | 0 |  |
| 1. Use of if-else structure | 1.8 | 1 | 0 |  |
| 1. Use of if-else-if structure | 1.8 | 1 | 0 |  |
| 1. Error condition in an if-else structure | 1.8 | 1 | 0 |  |
| 1. Use of && operator | 1.9 | 1 | 0 |  |
| 1. Use of || operator | 1.9 | 1 | 0 |  |
| 1. Using && or || to check conditions on multiple variables | 1.10 | 1 | 0 |  |
| 1. Save data from CSV file to a data frame | 2.1 | 1 | 0 |  |
| 1. Subset one cell in a data frame – save to variable | 2.2 | 1 | 0 |  |
| 1. Subset column in a data frame – save to vector | 2.2 | 1 | 0 |  |
| 1. Subset individual value in vector | 2.2 | 1 | 0 |  |
| 1. Use of sequence | 2.3 | 1 | 0 |  |
| 1. Use of sequence that increases or decreases by number other than 1 | 2.3 | 1 | 0 |  |
| 1. Sequence to set up iterations in a for() | 2.4 | 1 | 0 |  |
| 1. Three uses of state variable. *One point / use* | 2.4 | 3 | 0 |  |
| 1. Nested if() inside a for() | 2.4 | 1 | 0 |  |
| 1. Use of Boolean values. | 2.4 | 1 | 0 |  |
| 1. Find max, min, or average value of a vector using for() | 2.5 | 2 | 0 |  |
| 1. Ignoring NA values | 2.5 | 1 | 0 | Walleye summary statistics; mean, sd, se length/weight |
| 1. Add vector to data frame | 2.6 | 1 | 0 |  |
| 1. Rearrange columns in a data frame | 2.6 | 1 | 0 |  |
| 1. Write a data frame to a CSV file | 2.6 | 1 | 0 |  |
| 1. Label x-axis and y-axis and add title to a plot | 2.7 | 1 | 0 |  |
| 1. Adding a legend to a plot | 2.7 | 1 | 0 |  |
| 1. Adding colors to a plot | 2.7 | 1 | 0 |  |
| 1. Adding lines or points to a plot | 2.9 | 1 | 0 |  |
| 1. Histogram | 2.7/2.9 | 1 | 0 |  |
| 1. Barplot | 2.7/2.9 | 1 | 0 |  |
| 1. Multi-panel scatterplot using pairs() | 2.8/2.10 | 1 | 0 |  |
| 1. Create and use two of your own functions (2 point/each) | 2.10 | 4 | 0 |  |
| 1. Create a function with at least 2 input parameters | 2.10 | 2 | 0 |  |
| 1. Save the return value from your function to a variable | 2.10 | 1 | 0 |  |
| 1. Create a function with default parameters | 2.10 | 1 | 0 |  |
| 1. Use two functions from another package (1 point/each) | 3.1 | 2 | 0 | Select(), rename(), and pipe function |
| 1. Reshape a data frame | 3.2 | 2 | 0 | Walleye summary statistics; mean, sd, se length/weight |
| 1. Perform operation on multiple columns of a data frame or matrix | 3.2 | 2 | 0 |  |
| 1. Using substring function | 3.2 | 1 | 0 |  |
| 1. Rounding values | 3.2 | 1 | 0 | Walleye summary statistics; mean, sd, se length/weight |
| 1. Renaming columns | 3.2 | 1 | 0 | Use dplyr() to rename() columns with symbols (e.g. ‘Fish #’) |
| 1. Create a matrix | 3.3 | 1 | 0 |  |
| 1. Perform operation on rows, columns, and whole matrix | 3.3 | 1 | 0 |  |
| 1. Repeat values using the rep() function | 3.4 | 2 | 0 |  |
| 1. Perform up to two ANOVAs and comment on results. *One point each* | 3.4 | 2 | 0 |  |
| 1. Perform up to two t-tests and comment on results. *One point each.* | 3.4 | 2 | 0 |  |
| 1. Create a boxplots that uses multiple categories | 3.4 | 2 | 0 |  |
| 1. Randomly sample data | 3.5 | 1 | 0 |  |
| 1. Create pseudo-random values using set.seed() | 3.5 | 1 | 0 |  |
| 1. Sample from a normal distribution | 3.5 | 1 | 0 |  |
| 1. Subset a list | 3.5 | 1 | 0 |  |
| 1. Perform two linear regressions and comment on results. *One point each* | 3.6 | 2 | 0 |  |
| 1. Add regression line to a plot | 3.6 | 1 | 0 |  |
| 1. Up to four examples of subsetting a vector using which(). *One-half point each.* | 3.7 | 2 | 0 |  |
| 1. Use grep() on a vector | 3.7 | 2 | 0 |  |
| 1. Up to three examples of using subset vector to index another vector. *One point each.* | 3.7 | 3 | 0 |  |
| 1. Multiple condition on a subset vector | 3.8 | 2 | 0 |  |
| 1. Multiple conditions in a grep() | 3.8 | 1 | 0 |  |
| 1. Use of union() or intersect() | 3.8 | 1 | 0 |  |
| 1. Up to two examples of plotting subset vectors. *One point each.* | 3.7/3.8 | 1 | 0 |  |
| 1. Save results as an .rdata file | 3.5 | 2 | 0 |  |
| **Total Points**  Add up all the points from the ***Your Points*** column and put the results in this row. |  | **88** | **0** | If you highlight the cell to the left and press F9, the points in the ***Your Points*** column will automatically be added and the results put in the cell. |