Overview
This independent study was designed to provide advanced study in the real-world business application of the R programming language with emphasis on quantitative finance and portfolio risk management.

The independent study was completed through the Quantitative Solutions Group (QSG) within the South Carolina Retirement System Investment Commission (RSIC). Per their LinkedIn, the RSIC is a "professional investment management organization that manages more than $29 billion on behalf of over 500,000 plan participants." The QSG is comprised of business analysts whose focus is to retrieve and manipulate financial data to present investment performance analysis.

Motivation
With over 13,000 packages available, the capabilities of the R language are so vast that it is impossible to envision all it can do within a classroom setting. With the majority of these packages aligning with quantitative analysis, to dive deeper into the capabilities and use the quantitative packages in a real-world environment, solving real-world problems, it was important to set my independent study with an agency that is heavy with quantitative data.

First Project: replicate Excel product using R

Final Project: use R to query MySQL and Bloomberg; update MySQL database

Reflection
Going into the independent study, I expected to learn how to take raw data and use R to turn it into something useful, like taking a mess of numbers and tidying it up to produce something of clear value. What I learned far exceeds what I expected.

- Query Bloomberg machines to retrieve data
- Assist with writing R scripts to automate the Bloomberg queries
- Use R to interface w/ MySQL to create/update tables
- Design a MySQL database from the ground up to hold weekly counterparty risk data
- Take existing Excel books and automate data retrieval using R and replicate the format
- I learned I very much enjoy the database development process

Significance
What we know is limited by what we don’t know how to do and by what we don’t know is possible. Knowing that R interfaces with several other programs, like Bloomberg and MySQL, opens up the possibilities of how and where to pull data, how to display it in a useful way, and how to store it so it can be used in comparative analysis.

Future Plans
I would like to go further with R and quantitative analysis so I have added a statistics minor to my program, focusing on applied statistics, using R and SAS. I also want to further my experience using MySQL and other database programs. I am leaning more towards database administration or database development after graduation.

References
South Carolina Retirement System Investment Commission, LinkedIn: https://www.linkedin.com/company/south-carolina-retirement-system-investment-commission
https://cran.r-project.org/web/packages/

*script is combined effort of Senior Analyst Jonathan Graab, Intern Zach Allison, and Carla Fant

**not the actual data**