

MGMT 590: Using R for Analytics

Final Team Project

Instructor: Matthew A. Lanham

Description

Over the course of this term you have learned RStudio functionality to do various analytical tasks such as summarizing data with statistics, graphical visualizations, creating functions to achieve some task, development of a decision support system (DSS), as well as many examples of analytical tasks that fall under descriptive analytics, predictive analytics, prescriptive analytics, and big data analytics. Your team needs to describe a business (or research) problem, function, or operation that could better be supported via a decision-support tool created using RStudio.

A decision-support system (DSS) usually contains three components (1) a data component such as database, (2) a model component that helps to support the problem, and (3) a graphical user interface (GUI) component that allows the decision-maker to interact with the model or data, such as specifying parameters, etc.

You do not need to create a relational database, but you will need to find a dataset or simulate one that your model and GUI will use to demonstrate your DSS prototype. Your model may be visual/descriptive in nature, predictive, prescriptive, or something else. There are R packages for nearly anything you can think of. You will make a case for whatever methodology you choose to use to support the problem. Your GUI should be an R Shiny app that does something useful to help support a decision and where the end-user can specify parameters and run the tool so as to help provide them information that will help support their decision-making. See <http://shiny.rstudio.com/gallery/> for examples you might modify to develop your DSS. A Shiny cheat sheet can be found [here](#), as well as some [videos](#) you might find useful. **Read the grading rubric below carefully.** Your DSS prototype need not be extremely sophisticated. The important thing is you justify the need for it and provide some feature(s) necessary to help the decision-maker.

Think about what you would like to present to someone about the functionality of your app in a video. Picture yourself doing this and think about how you'd like to see yourself. This is good to be thinking of this now if you want to truly maximize your experience from this course. A video showing your technical R skills, soft skills, and business/research skills would be fantastic to add on LinkedIn or your analytical portfolio in your job search.

The questions you answer below are important ones that you will be required to answer in developing DSSs in practice.

Teams

You must form teams consisting of 3-4 members. If you do not have a team by Thursday, August 30th, I will assign you to one. All team members should clearly be identified with their project goals in the Project sign-up tab in Blackboard by this date.

Due Date

Your team will have one submission that is due by Friday, October 12th. The submission must include (1) a brief write-up along, (2) your code shared with me via a Private GitHub repo, (3) a working DSS posted on <https://www.shinyapps.io/> (only post here if you're not working with proprietary data – talk to me in how to submit) and (4) a video (no more than 15 minutes long). I want the videos downloaded and added to your GitHub repo as well. I might show a few of them to next year's class as an example. Every student must also email me the team evaluation scores you give their teammates. Teammate individual scores will not be shared with your teammates.

Grading Rubric

| | Total Potential Points | Exemplary | Proficient | Developing |
|--------------------------------------|------------------------|--|---|---|
| Business/Research Problem Definition | ___/10 | 10 <ul style="list-style-type: none"> • A clear and concise description of the business/research problem • Identification of Stakeholders • Discussion whether the problem is amenable to an analytics solution • Refinement of the problem to identify any delineate constraints • Define the initial set of business benefits • Statement claiming that stakeholder agreement on the business problem statement has been determined | 7.5 <ul style="list-style-type: none"> • A broad or unclear description of the business problem • Missing one of the other bullets | 5 <ul style="list-style-type: none"> • Extremely broad or unclear description of the business problem • Missing more than one of the other bullets |
| Analytics Problem Definition | ___/10 | 10 <ul style="list-style-type: none"> • Reformulate problem statement as an analytics problem • Develop a proposed set of drivers and relationships to outputs • State the key set of assumptions related to the problem • Define key metrics of success • Statement claiming stakeholder agreement on the approach | 7.5 <ul style="list-style-type: none"> • Unclear description of problem statement as an analytics problem • Missing one of the other bullets | 5 <ul style="list-style-type: none"> • Poor description of problem statement as an analytics problem • Missing more than one of the other bullets |
| Data | ___/10 | 10 <ul style="list-style-type: none"> • A discussion that identifies and prioritizes data needs and sources | 7.5 <ul style="list-style-type: none"> • Poor discussion about what data is best, the data you can get, and if | 5 <ul style="list-style-type: none"> • A lack of discussion about what data is best, the data you can |

| | | | | |
|-----------------------|--------|--|--|---|
| | | <ul style="list-style-type: none"> • Acquire data that is actually available • Harmonize, rescale, clean, and share data in your DSS • Identify relationships in the data • Document and report findings (e.g., insights, results, business performance) • Refine the business and analytics problem statements (if needed) | <p>it sufficient to support the decision</p> <ul style="list-style-type: none"> • Missing one of the other bullets | <p>get, and if it sufficient to support the decision</p> <ul style="list-style-type: none"> • Missing more than one of the other bullets, especially review of the data |
| Methodology Selection | ___/10 | <p>10</p> <ul style="list-style-type: none"> • Identify a few problem solving approaches (methods) and use one or two • Discuss why R is a viable tool to use • Test and select an approach you believe might work | <p>7.5</p> <ul style="list-style-type: none"> • Identifies only one potential method • Missing one of the other bullets | <p>5</p> <ul style="list-style-type: none"> • Missing two or more bullets |
| Model Building | ___/10 | <p>10</p> <ul style="list-style-type: none"> • Run and evaluate the model • Calibrate model and data • Discussion of integrating the model back to the problem • Discussion of any findings (including assumptions, limitations, and constraints) | <p>7.5</p> <ul style="list-style-type: none"> • Missing one of the following bullets | <p>5</p> <ul style="list-style-type: none"> • Missing more than one of the following bullets |
| Functionality | ___/35 | <p>35</p> <ul style="list-style-type: none"> • Discuss/show what the DSS can do • Does this tool appear to do more than others in the course? • Discuss any R packages you found useful • Did you have to write any conditional logic? • If you had more time or experience, what other enhancements might you like to add? | <p>25</p> <ul style="list-style-type: none"> • Unclear or basic discussion/show of what the DSS can do • Does this tool appear to do typical things others did in the course? • Missing one of the other bullets | <p>10</p> <ul style="list-style-type: none"> • Poor discussion/show of what the DSS can do • Does this tool appear to do very little compared to others in the course? • Missing more than one of the other bullets |
| GUI Design & Quality | ___/15 | <p>15</p> <ul style="list-style-type: none"> • Does the tool work without errors? | <p>10</p> <ul style="list-style-type: none"> • Tool works but has obvious errors | <p>5</p> <ul style="list-style-type: none"> • Tool works but has obvious errors or does not work at all |

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|---------------------|----------------|---|---|--|
| | | <ul style="list-style-type: none"> • Does it appear as good or better than the Shiny example templates on RStudio.com? • Does this tool appear high quality compared to others in the course? | <ul style="list-style-type: none"> • Appears as good or better than the Shiny example templates on RStudio.com • Does this tool appear mediocre compared to others in the course? | <ul style="list-style-type: none"> • Does not appear as good or better than the Shiny example templates on RStudio.com • Does this tool appear very poor compared to others in the course? |
| TOTAL POINTS | ___/100 | | | |

Note that I will be grading the functionality, design, and quality based on what everyone else does. Last year, I had all students vote, but this year I will be deciding by myself only.

If you have any questions, please ask.

Here are some previous student group examples from last year:

- https://manyamittal.shinyapps.io/workforce_analytics/
- <https://kalyan-s-mupparaju.shinyapps.io/bankapp1/>
- <https://xueyingyang.shinyapps.io/mealmate/>
 - https://github.com/snowflake0325/Meal_Mate
- <https://github.com/parijatrai90/Rshiny-App>
- <https://karthiksajeev94.shinyapps.io/project/>
 - <https://github.com/karthiksajeev94/RProject>
- <https://supplychainkrannert.shinyapps.io/superhero/>
- <https://anuragsoni9.shinyapps.io/spotifyapp/>
 - https://github.com/mkewlani16/UR4A_FinalProject
- <https://rfinalrelocationmap.shinyapps.io/rfinal1003/>
- https://wlwarriors.shinyapps.io/wl_warriors/