

Project 1

Semester One 2024

The content and delivery of content in this course are protected by copyright. Material belonging to others may have been used in this course and copied by and solely for the educational purposes of the University under license. You may copy the course content for the purposes of private study or research, but you may not upload onto any third party site, make a further copy or sell, alter or further reproduce or distribute any part of the course content to another person.

This project draws on lecture and lab content from Module 1: Creating HTML by combining modern technologies. The knowledge and skills assessed by the project will be covered in lectures/labs by **the end of Module 1**. Consequently, the order of the project instructions below does not necessarily reflect the order the material is covered in lectures/labs.

Prep work

- You will also need access to a computer that has R (<https://cran.r-project.org/>) installed and RStudio (<https://posit.co/download/rstudio-desktop/>) installed.
- If installing R and RStudio onto your computer is a problem, you can use the free level of Posit Cloud (<https://posit.cloud/>)
- Install the R package {tidyverse} first (this will take a while)
- Then install the R package {magick}

*Remember, you can use the lab sessions to get help with completing your project, and with any technical difficulties you face, like installing R or RStudio, or any packages. If you are using a mac, and have issues with the {magick} package, then **installing xquartz** (<https://www.xquartz.org/>) will probably fix the problem!*

Part A: Setting up a GitHub account and repo

- If you do not already have a GitHub (<https://github.com>) account, you will need to set up a free account for use during this course (and beyond!). **Think wisely about what to name your account - remember future employers might look at it!**
- In your GitHub account, create a new repository called “stats220”. Choose the option to create a *README.md* file at the same time as creating your new repository.
- Edit the *README.md* file so that it contains some information about the purpose of the repo, so that other people who view your repo on GitHub know why you made it. Your *README.md* file needs to demonstrate *at least* the following Markdown syntax (you can do more if you want!):
 - use of two different levels of headers
 - use of two different types of bullet points (ordered and unordered)
 - use of **bold** and *italics*
 - use of links to other websites
- Record the link to your GitHub repo. It should look something like this:
https://github.com/annafergusson/stats220_demo
(https://github.com/annafergusson/stats220_demo)

*Remember, that your repo is public, so only write and share content that you are comfortable with others viewing. You can **view the “demo” repo Anna set up on GitHub** (https://github.com/annafergusson/stats220_demo) for some ideas to get started, although you should not copy this exactly!*

Part B: Meme creation

- Create a folder **on your computer (or within RStudio Cloud)** called stats220. You will use this folder for all your work this semester, and will create subfolders within it for each of the projects.
- Within the stats220 folder, create a new project using RStudio that is called “Project1”
 - Create all R script files and Rmd files in this folder, and save any data and image files (e.g. plots, animated GIFs) to this folder
- The video below shows you how to do these first two things!

0:00 / 3:19

- Find an existing meme online that you will use as “inspo” for this part of the project
 - Record the link to the meme (e.g., the web address for the meme)
 - Save the existing meme to your *Project1* folder and name it *inspo_meme* (use an appropriate file extension, e.g. *.png*)
 - Analyse the design of the meme and identify the key components of the image you will need to create
 - Identify at least two features of the meme that you will change (e.g., images, text)
- Create a new R file within your *Project1* project called “meme.R”.
 - Edit the first line of the file so that it reads `library(magick)`
- Develop R code within the *meme.R* file to create your new meme. Your R code needs to demonstrate the following:
 - use of *at least* the following functions: `c()`, `image_blank()`, `image_read()`, `image_annotate()`, `image_append()`
 - use of pipes e.g. `%>%`
 - use of named objects e.g. `meme <- image_read(url)`
 - use of comments e.g. `# note to self`
 - use of indenting and “white space”
- Include R code that saves your meme as an image file (e.g. *.png*), using the `image_write()` function.
 - For example, to save the {magick} object called `meme` as an image file called *my_meme.png*, use the code

`image_write(meme, "my_meme.png")` or the code

`meme %>% image_write("my_meme.png")`

- Develop R code to add animation to your meme. Your R code needs to demonstrate the following:
 - use of at least the `image_animate()` function
 - creation of at least 4 different frames for the animation using a combination of different functions from the `{magick}` package
 - use of named objects e.g. `meme <- image_read(url)`
 - use of comments e.g. `# note to self`
 - use of indenting and “white space”
- Include R code that saves your animated GIF as an image file (e.g. `.gif`), using the `image_write()` function.
 - For example, to save the `{magick}` object called `animation` as an image file called `my_animation.gif`, use the code
`image_write(animation, "my_animation.gif")` or the code
`animation %>% image_write("my_animation.gif")`

Part C: HTML creation

The main purposes of the project report are provide you with an opportunity to: (1) demonstrate or explain how you have met some of the requirements for the project, and, (2) reflect on your learning for this project and across Module 1. Make sure to refer to the marking guide at the end of this page when completing your project and writing this report.

- **Download this Rmd file (ref/project1_report.Rmd)** to use as a template, making sure to save it within your Project1 project folder as “project1_report.Rmd”
- Open `project1_report.Rmd` using RStudio, making sure you are working within your *Project1* project.
- Change the title to “Creating images with R” and add your name as the author. **Note: RStudio will automatically install the packages needed to write and knit .Rmd files the first time you use RMarkdown.**
- Edit the YAML so that the subtitle says “with a little bit of magick”.
- Edit the CSS chunk so that it changes the visual appearance of your report in at least three different ways.
- The page is structured using **second-level** headings. Details of what you need to include under each heading is given below.

- Under the *Project requirements* section of your page:
 - Briefly summarise how you have met the requirements related to working with GitHub (and optionally GitHub pages). Include the links to your repo and to your website (these are different links).
 - Include a screenshot of the project folder you have created on your computer using markdown. It should be obvious in the screenshot that you have set up and used .Rproject within RStudio, and all files and images used for this project should be visible.
 - *Write at least 100 words for this section*
- Under the *My meme* section of your page:
 - **Use markdown** to display the “inspo” meme (i.e. use ``)
 - Describe the key components of the image you re-created and the features you changed
 - Include the code used to create your meme in the code chunk labelled “meme-code”
 - When you knit your Rmd file to HTML, your meme will be produced and included in the output (make sure your R code does produce your meme as output)
 - Include the code used to create your animated meme in the code chunk labelled “animation-code”
 - When you knit your Rmd file to HTML, your animated meme will NOT be produced and included in the output
 - Instead, include the GIF you created in Part B using markdown
- Under the *Creativity* section of your page:
 - Describe and justify how your project demonstrates creativity.

*What does “demonstrate creativity” mean? It means that you have gone beyond what was asked in terms of either your explanations, creations, presentation or use of data technologies. For this project, that could mean using additional functions from the {magick} package that were not covered in the lectures/labs (given they build on/extend what was taught), using more CSS than what was required to change the appearance of your HTML, adding more content to your GitHub website (e.g. creating another webpage using Rmd that is linked to from your index page), or incorporating additional context when creating the meme or animated GIF. **You can check with Anna or the lab tutors to confirm your plans for creativity are sufficient!***

- Under the *Learning reflection* section of your page:

- Describe in your own words at least ONE important idea you learned from Module 1 *Creating HTML by combining modern technologies*.
- Discuss what things related to data technologies that you are more curious about exploring further.
- It shouldn't have to be said, but do not use text generation AI tools for this section (or any part of writing this project).
- *Write at least 100 words for this section*
- Knit your *project1_report.Rmd* file to create a self-contained *project1_report.html* file. Check the *project1_report.html* carefully that all code used, included CSS code, is visible otherwise you will lose marks.

Optional component: Setting up Github Pages

- Go to your *stats220* repo on Github
 - Add a new empty file called “.nojekyll” to the root of your *stats220* repository (repo)
 - Create a new Rmd file called “index.Rmd” within your Project1 project folder
 - Add whatever content you want to your *index.Rmd* file and then knit to create
 - Upload your *index.html* file into your *stats220* repo (as your HTML file is ‘self-contained’ your images have been saved within the file)
- Set up GitHub Pages for your *stats220* repository (repo). **Note this is not the same as setting up an account, this is an additional step.**
 - Record the URL (web address) for your published stats220 website.
- Click on the URL to check it works (it will take a few minutes for the website to become “alive”!)
- The video below demonstrates most of these steps!


0:00 / 10:37









This is one way you can set up your own website for free using Github Pages, for example a portfolio page showcasing different data science products you have created. We will continue to develop your knowledge of creating and publishing webpages over the remainder of this course. This component of the project is not work marks but will be helpful for building your overall knowledge of data technologies, knowledge which may be assessed in the test or exam.

Marking guide

*For this project, you will submit the following files: -
project1_report.html*

The project will be marked out of 10. The criteria given below are based on the six learning objectives of Module 1 and the three focuses for this course:

	Focus or objective	Criteria
	Develop creativity with data and technology	The project demonstrates creativity (1 mark)

	Focus or objective	Criteria
	Use Markdown to create HTML for web pages	The Markdown syntax used meets the stated requirements (1 mark)
	Use R Markdown to structure and create web pages	The visual appearance of the HTML created has been modified in at least three different ways using CSS code (1 mark)
	Develop communication with data and technology	The development of the new <i>meme</i> has been described by identifying and modifying features of the <i>inspo</i> meme. (1 mark)
	Share work using GitHub & GitHub Pages	The GitHub repo contains the required files (1 mark)
	Create and use projects in RStudio	A RStudio project folder was created and used for the project (1 mark)
	Develop R-coding related knowledge	The R code features use of comments, indenting, and “white space” (1 mark)
	Identify key syntax features of R code	A new <i>meme</i> has been created with R code that meets the stated requirements (1 mark)
	Re-use and combine R functions to create a desired product	A new <i>animated GIF</i> has been created with R code that meets the stated requirements (1 mark)
	Submission requirements	The project report meets the stated requirements and all correct files were submitted for the project (1 mark)