Getting Started with GitHub and R Markdown A Step-by-Step Guide for Your Final Project

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Abstract

This tutorial will guide you through setting up a GitHub account, creating a repository, and hosting an R Markdown (.Rmd) file for your final project. By the end of this guide, you'll have a professional online portfolio showcasing your work.

Contents

1	Introduction	3
2	Part 1: Creating Your GitHub Account	3
	2.1 Step 1: Sign Up	3
	2.2 Step 2: Configure Your Profile	3
3	Part 2: Creating Your First Repository	4
	3.1 What is a Repository?	4
	3.2 Step 1: Create a New Repository	4
	3.3 Step 2: Understanding Your Repository Structure	4
4	Part 3: Working with R Markdown Files	5
	4.1 Creating an R Markdown File	5
	4.2 Basic R Markdown Structure	5
5	Part 4: Uploading Files to GitHub	6
	5.1 Method 1: Using the GitHub Web Interface	6
	5.2 Method 2: Using Git Commands	6
6	Part 5: Hosting Your R Markdown File	6
	6.1 Enabling GitHub Pages	6
	6.2 Accessing Your Published Project	7
7	Part 6: Project Requirements Checklist	7
	7.1 Repository Structure	7
	7.2 R Markdown Requirements	7
	7.3 GitHub Requirements	7
8	Troubleshooting Common Issues	8
	8.1 GitHub Pages Not Working	8
	8.2 R Markdown Won't Knit	8

9	Additional Resources	8
10	Submission Instructions	8

1 Introduction

GitHub is a powerful platform for version control and collaboration that has become essential in data science and academic research. For your final project, you'll use GitHub to:

- Create a professional online presence
- Share your R Markdown analyses
- Manage version control for your project
- Enable collaboration and feedback

Learning Objectives

By completing this tutorial, you will:

- 1. Create and configure a GitHub account
- 2. Initialize and manage a repository
- 3. Upload and maintain R Markdown files
- 4. Understand basic Git commands
- 5. Host your final project professionally

2 Part 1: Creating Your GitHub Account

2.1 Step 1: Sign Up

- 1. Navigate to https://github.com
- 2. Click "Sign up" in the upper-right corner
- 3. Enter your information:
 - Email address (use your academic email)
 - Create a password (make it strong!)
 - Choose a username (professional, e.g., firstlast or firstname-lastname)
- 4. Complete the verification puzzle
- 5. Choose the free plan

2.2 Step 2: Configure Your Profile

- 1. Click your avatar \rightarrow Settings
- 2. Add a professional photo
- 3. Fill in your bio:
 - Name

- Brief bio (e.g., "PhD Student in Statistics at Cornell University")
- Location (e.g., "Ithaca, NY")
- Website/LinkedIn (if available)

Pro Tip

Choose a username that you can use professionally. Many employers check GitHub profiles!

3 Part 2: Creating Your First Repository

3.1 What is a Repository?

A repository (or "repo") is like a project folder that tracks all changes to your files. For your final project, you'll create a repository to store your R Markdown file and any associated data or outputs.

3.2 Step 1: Create a New Repository

- 1. Click the "+" icon in the top-right corner
- 2. Select "New repository"
- 3. Configure your repository:
 - Repository name: final-project-[course]-[year] (e.g., final-project-stsci6020-2025)
 - Description: "Final project for [Course Name]"
 - Choose "Public" (required for grading)
 - Check "Add a README file"
 - Add .gitignore: select "R" from the template
 - Choose a license: MIT License (recommended)
- 4. Click "Create repository"

3.3 Step 2: Understanding Your Repository Structure

Your new repository contains:

- **README.md**: Project description (in Markdown)
- .gitignore: Lists files Git should ignore
- LICENSE: Legal terms for using your code

4 Part 3: Working with R Markdown Files

4.1 Creating an R Markdown File

- 1. Open RStudio
- 2. File \rightarrow New File \rightarrow R Markdown
- 3. Enter details:
 - Title: "Final Project Analysis"
 - Author: Your name
 - Output format: HTML (recommended)
- 4. Save as final_project.Rmd

4.2 Basic R Markdown Structure

```
1 ---
2 title: "Final Project Analysis"
3 author: "Your Name"
4 date: "'r Sys.Date()'"
5 output:
    html_document:
6
      toc: true
7
      toc_float: true
8
9
      theme: cosmo
10 ---
11
12 # Introduction
13
14 Your project introduction here...
15
16 # Methods
17
18 ## Data Description
19
20 '''{r setup, include=FALSE}
21 knitr::opts_chunk$set(echo = TRUE, warning = FALSE, message = FALSE)
22 library(tidyverse)
23 library(knitr)
24 (((
25
26 ## Analysis
27
28 '''{r data-import}
29 # Your code here
30 (((
31
32 # Results
33
34 Your results discussion...
35
36 # Conclusion
37
38 Your conclusions...
```



5 Part 4: Uploading Files to GitHub

5.1 Method 1: Using the GitHub Web Interface

- 1. Navigate to your repository
- 2. Click "Add file" \rightarrow "Upload files"
- 3. Drag and drop your files:
 - final_project.Rmd
 - final_project.html (after knitting)
 - Any data files (in a data/ folder)
- 4. Add a commit message: "Add final project files"
- 5. Click "Commit changes"

5.2 Method 2: Using Git Commands

```
1 # Clone your repository
2 git clone https://github.com/YOUR_USERNAME/final-project-2024.git
3
4 # Navigate to the repository
5 cd final-project-2024
6
7 # Add your files to the repository
8 cp path/to/final_project.Rmd
9 cp path/to/final_project.html .
10
11 # Stage all files
12 git add .
13
14 # Commit with a message
15 git commit -m "Add final project analysis"
16
17 # Push to GitHub
18 git push origin main
```

Listing 2: Basic Git Commands

6 Part 5: Hosting Your R Markdown File

6.1 Enabling GitHub Pages

- 1. In your repository, go to Settings
- 2. Scroll to "Pages" in the left sidebar
- 3. Under "Source," select:
 - Branch: main
 - Folder: / (root)
- 4. Click "Save"
- 5. Wait a few minutes for deployment

6.2 Accessing Your Published Project

Your project will be available at:

https://YOUR_USERNAME.github.io/final-project-2024/final_project.html

Success!

Congratulations! Your R Markdown analysis is now publicly accessible. Share this link in your project submission.

7 Part 6: Project Requirements Checklist

7.1 Repository Structure

- README.md with project description
- final_project.Rmd (source file)
- final_project.html (rendered output)
- data/ folder (if applicable)
- figures/ folder (if applicable)

7.2 R Markdown Requirements

- YAML header with title, author, and date
- Table of contents
- At least 3 sections (Introduction, Analysis, Conclusion)
- Code chunks with appropriate labels
- Visualizations with proper captions
- References/bibliography (if required)

7.3 GitHub Requirements

- Public repository
- Descriptive repository name
- Professional commit messages
- GitHub Pages enabled
- Working project URL

8 Troubleshooting Common Issues

8.1 GitHub Pages Not Working

- Ensure your HTML file is named correctly
- Check that GitHub Pages is enabled in settings
- Wait 5-10 minutes after enabling Pages
- Clear your browser cache

8.2 R Markdown Won't Knit

- Check for syntax errors in YAML header
- Ensure all required packages are installed
- Verify file paths for data/images
- Look for unmatched brackets or quotes

9 Additional Resources

- Happy Git with R Comprehensive Git/GitHub guide for R users
- R Markdown Documentation Official RStudio documentation
- GitHub Docs Official GitHub documentation
- Markdown Guide Markdown syntax reference

10 Submission Instructions

For your final project submission, provide:

- 1. GitHub repository URL
- 2. GitHub Pages URL for your rendered project
- 3. Brief description of your analysis (100-200 words)

Important Deadline

Submit your project URLs by Wednesday May 14th at 11:59 PM.

Good luck with your final project!

Questions? Feel free to contact me via email.