PLS 120: Applied Statistics in Agriculture

Interactive R Programming with Binder

Week 1 Tutorial Guide

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Contents

Welcome to PLS 120!

In this course, we use the **R programming language** for statistical analysis in agriculture. Instead of installing R and RStudio on your computer, we use **Binder** and **Jupyter Notebooks** to provide you with a ready-to-use environment. No software installation needed!

Why Use Binder?

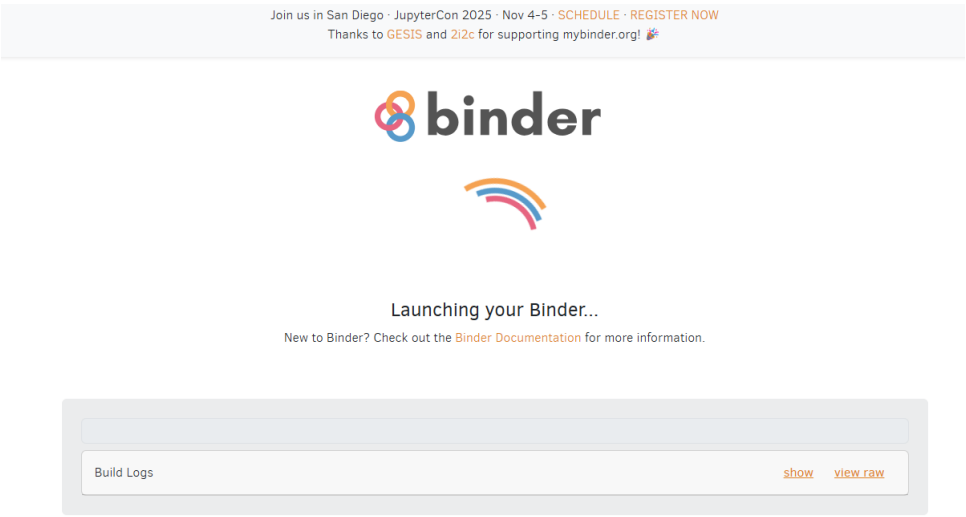
Benefits of Using Binder:

- **No Installation Required** - Everything runs in your browser
- **Pre-configured Environment** - All packages already installed
- **Cross-platform** - Works on Windows, Mac, Linux
- **Always Updated** - Latest versions of R and packages
- **Easy Sharing** - Just click a link to get started

Getting Started: Step-by-Step Guide

Step 1: Launch Binder Environment

Click the **"Launch Binder"** button to start your R environment. This will take **2-5 minutes** to load.



Binder is launching your environment - please wait patiently!

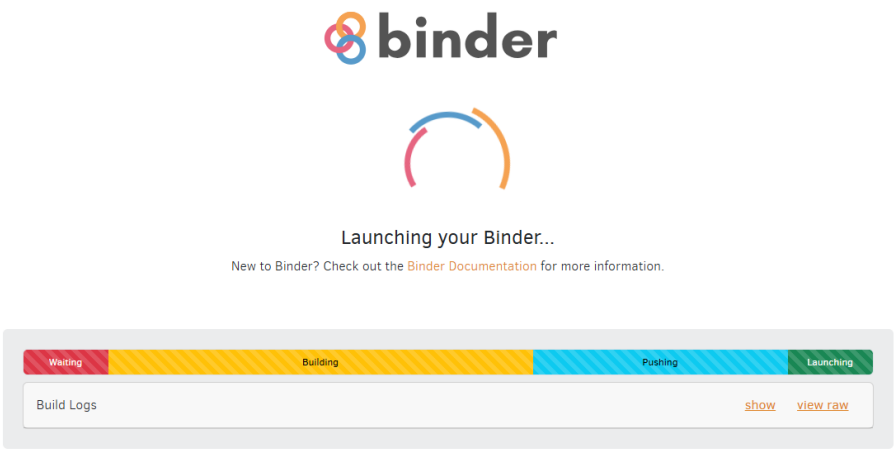
Step 2: Wait for Environment to Load

After clicking the link, Binder will show progress through several stages:

- **Waiting**
- **Building**
- **Pushing**

- **Launching**

The green progress bar shows Binder is almost ready!



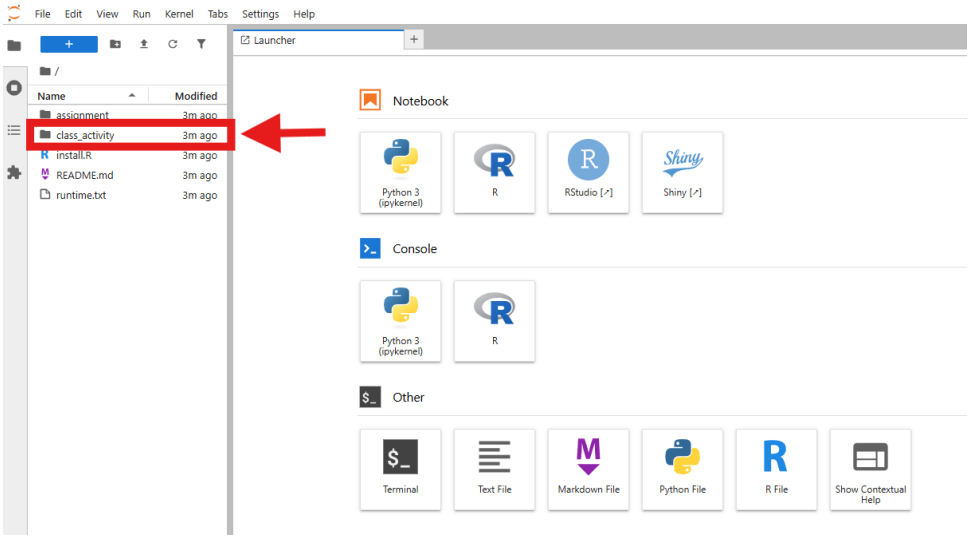
Green bar means your environment is ready in just a few seconds!

Step 3: Navigate to Class Activity

Once Binder loads, you'll see the Jupyter Notebook interface. In the **left panel**, you'll see several folders:

- `assignment/` - Your homework assignments
- `class_activity/` - Lab tutorials and exercises
- Various files (README.md, runtime.txt, etc.)

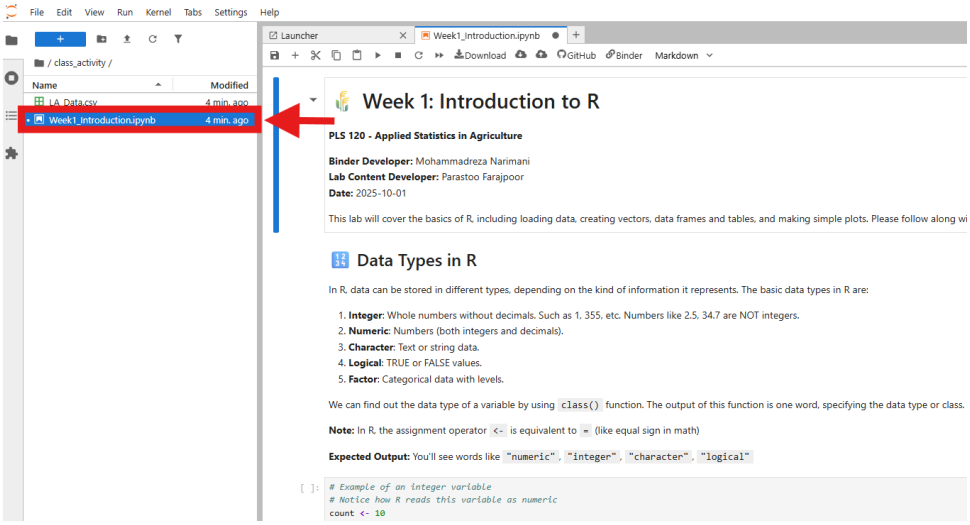
Click on the `class_activity` folder to access this week's content.



Click here to access your lab materials

Step 4: Open the Lab Notebook

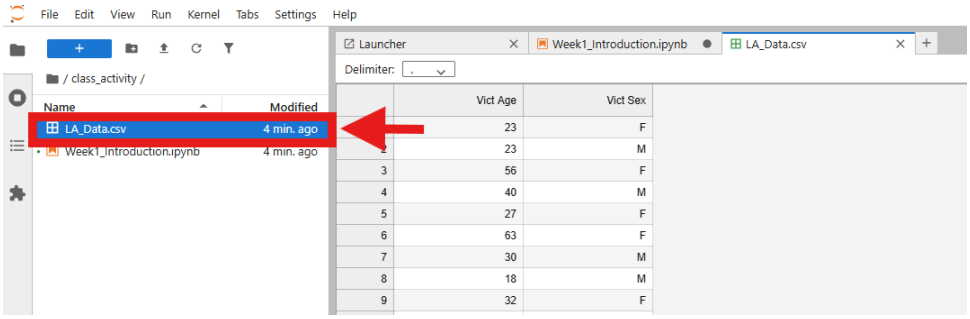
Inside the `class_activity` folder, **double-click** on `Week1_Introduction.ipynb` to open the interactive lab notebook.



Double-click here to open the lab instructions and code

Step 5: Explore the Data (Optional)

We've already uploaded the data for this lab! The file `LA_Data.csv` contains the crime statistics data. You can **double-click** on it to explore the data if you're curious.



Click here to view the raw data (optional)

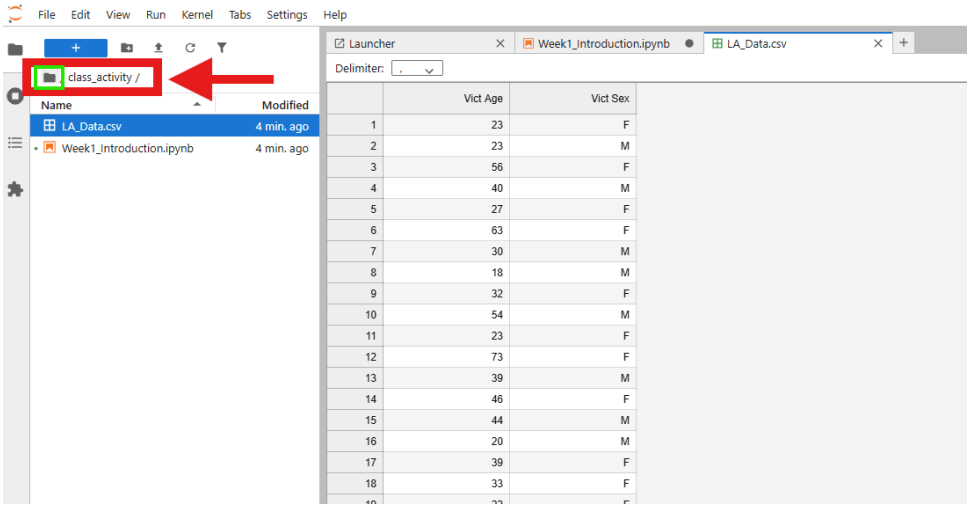
Saving Your Work

Important: Binder environments are temporary! Always save your work locally.

Download Your Notebook

When you're done working, save your progress:

1. **Go back to main folder** - Click the folder icon in the left panel



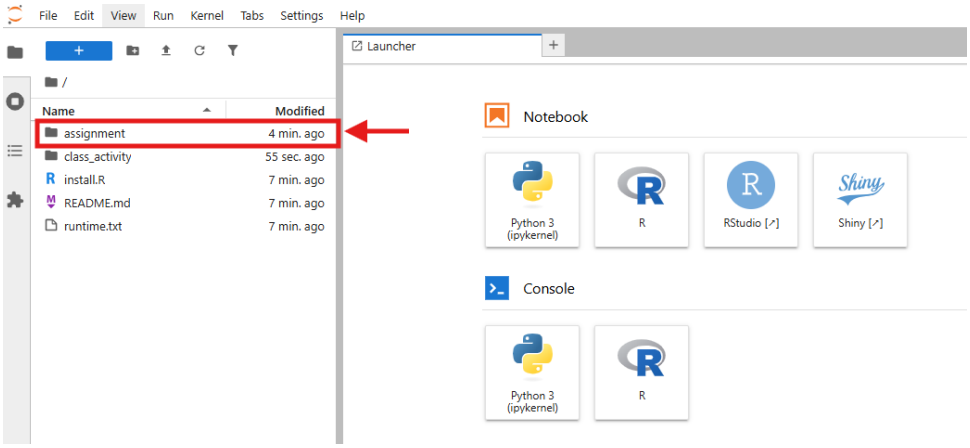
Click the folder icon to return to the main directory

2. **Download your notebook** - Right-click on your `.ipynb` file and select "Download"

Completing Assignments

Step 1: Access Assignment Folder

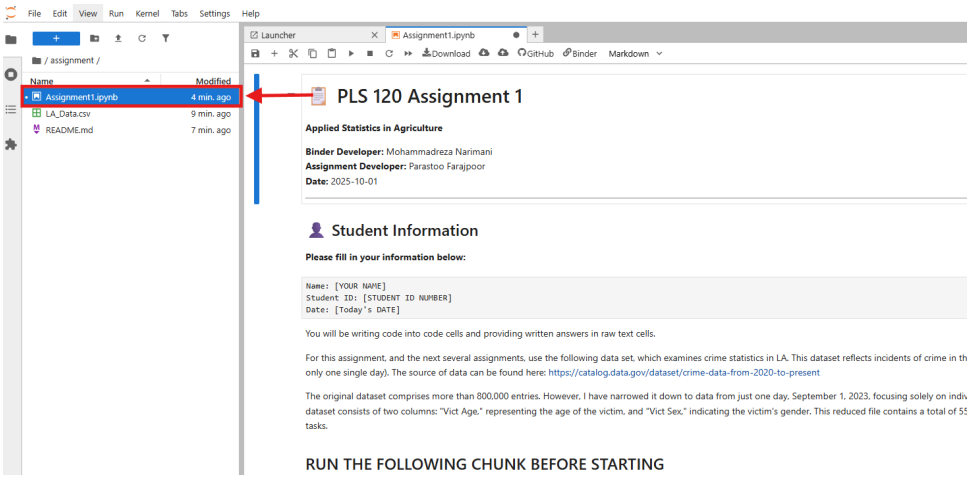
From the main directory, **click on the `assignment` folder** to access your homework.



Click here to access assignment materials

Step 2: Open Assignment Notebook

Double-click on `Assignment1.ipynb` to open your assignment.



Double-click here to open your assignment

Step 3: Complete Your Work

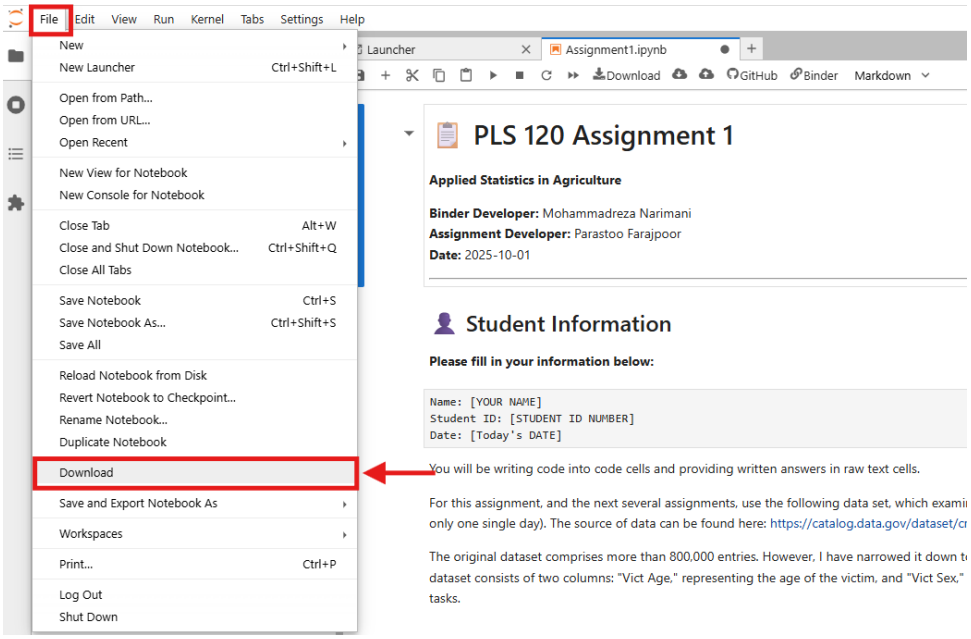
Fill in all **code boxes** and **text boxes** carefully to answer all questions. Look for:

- Question mark emojis indicating questions to answer
- Code cells with hints in comments
- Raw text cells for your written responses

Step 4: Download Your Completed Work

5.4.1 Download Code File (.ipynb)

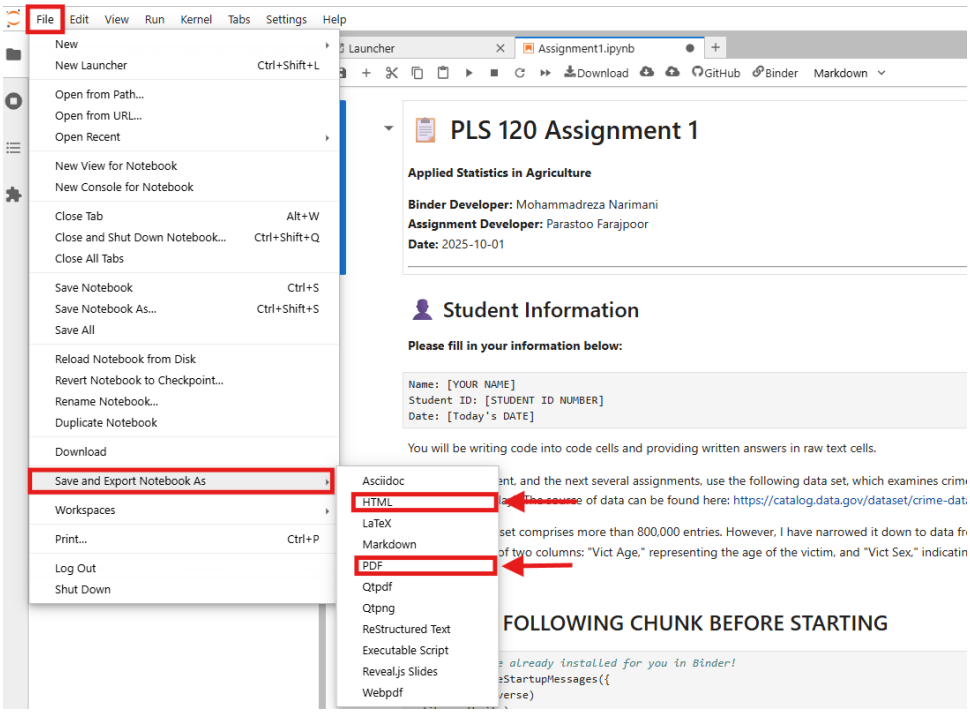
Click **File** → **Download** to save your notebook code.



Download your .ipynb file for backup

5.4.2 Export HTML/PDF Report

For submission, you also need an HTML or PDF report:
Click **File** → **Save and Export Notebook As** → **HTML** (or PDF)



Export your completed assignment as HTML or PDF

Submission Requirements

For each assignment, submit **TWO files** to UC Davis Canvas:

1. **HTML/PDF Report** - Your formatted assignment with outputs
2. **.ipynb File** - Your notebook code as backup

Need Help?

Contact Information

Mohammadreza Narimani
Email: mnarimani@ucdavis.edu
Department of Biological and Agricultural Engineering, UC Davis
Office Hours: Thursdays 10 AM - 12 PM (Zoom)

Technical Issues

- **Binder won't load?** Try refreshing the page or clearing browser cache
- **Lost your work?** Always download files before closing Binder
- **Code not working?** Check for typos and make sure you've run all previous cells

Learning Resources

- **R Documentation:** Use `?function_name` in code cells for help
- **Course Materials:** All tutorials are in the `class_activity` folder

- **Practice:** Try modifying the example code to learn more!

What You'll Learn

- **R Programming Basics** - Variables, vectors, data frames
- **Data Visualization** - Histograms, plots, charts
- **Statistical Analysis** - Descriptive statistics, hypothesis testing
- **Agricultural Applications** - Real-world data analysis
- **Report Writing** - Professional statistical reports

Tips for Success

Best Practices

- **Read instructions carefully** before starting each exercise
- **Run code cells in order** - later cells depend on earlier ones
- **Save frequently** - Download your work regularly
- **Experiment** - Try modifying code to see what happens
- **Ask questions** - Don't hesitate to reach out for help

Keyboard Shortcuts

- **Shift + Enter** - Run current cell and move to next
- **Ctrl + Enter** - Run current cell and stay in place
- **A** - Insert cell above
- **B** - Insert cell below
- **DD** - Delete current cell

Ready to Start?

Visit the course website or click the Binder link to launch your first R programming session!

Happy coding!