PLS 120: Applied Statistics in Agricultural Sciences

Interactive R Programming with Binder

Week 1 Tutorial Guide

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Contents

Important Links

> **Essential Course Resources**
>
> **Course Website**
>
> **All course materials are available at:**
>
> **Click Here to Access Course Website**
>
> **Interactive Binder Environment**
>
> **Access Week 1 lab materials directly:**
>
> **Click Here to Launch Binder**

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
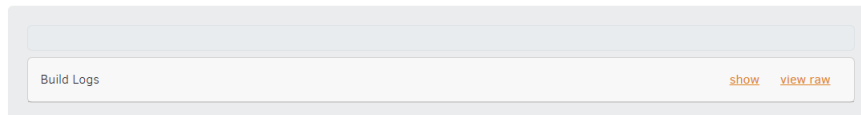
Step 1: Launch Binder Environment

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

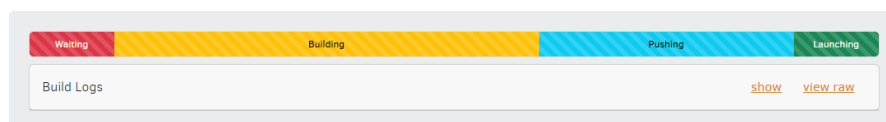After clicking the link, Binder will show progress through several stages:

- **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!
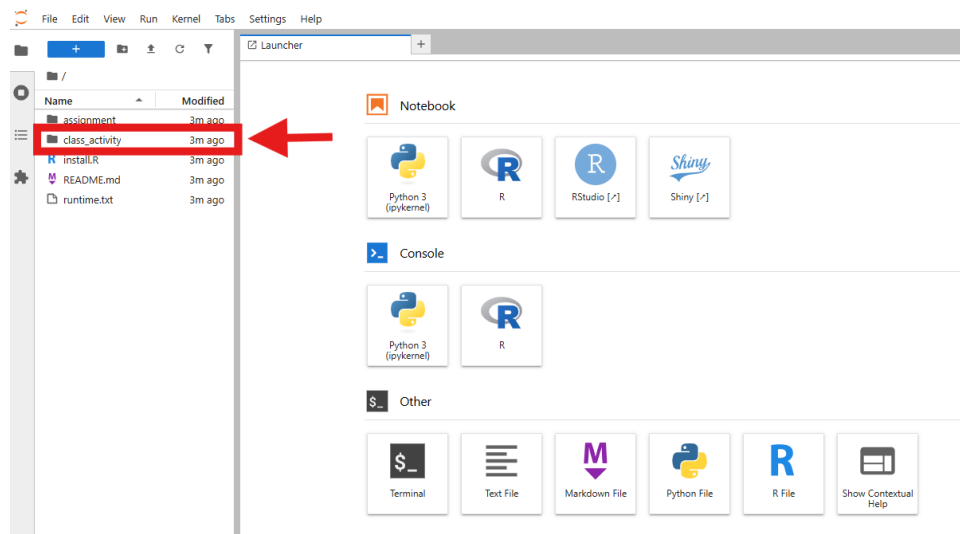
Step 3: Navigate to Class Activity

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
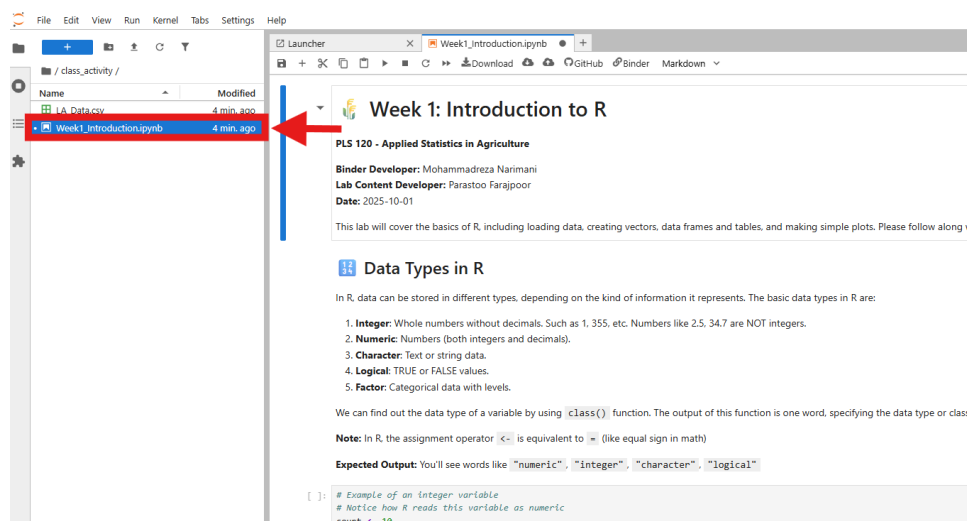
- Various files (README.md, runtime.txt, etc.)

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

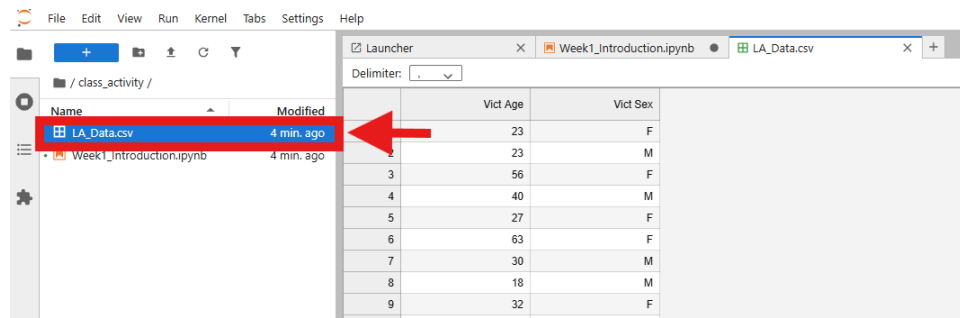Inside the `class_activity` folder, **double-click** on `Week1_Introduction.ipynb` to open the interactive lab notebook.

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.
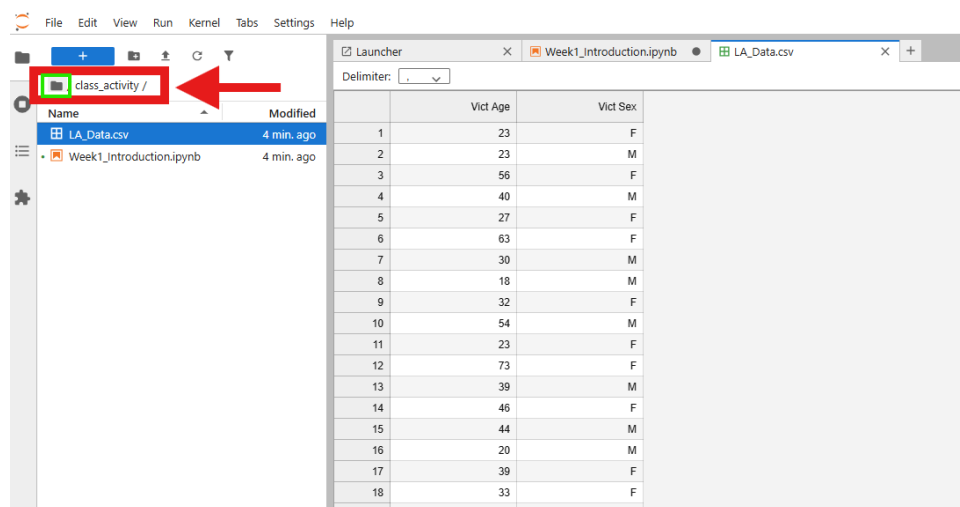
Click here to view the raw data (optional)

Saving Your Work

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

Download Your Notebook

When you're done working, save your progress:

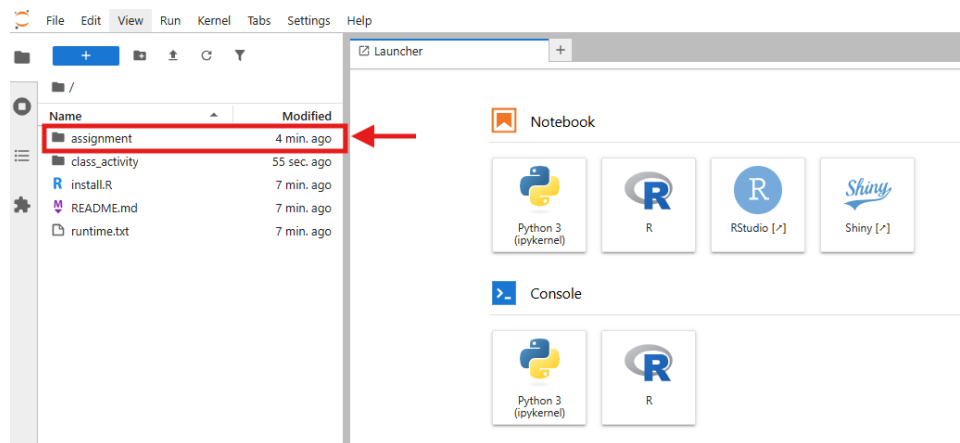1. **Go back to main folder** - Click the folder icon in the left panel

Click the folder icon to return to the main directory

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

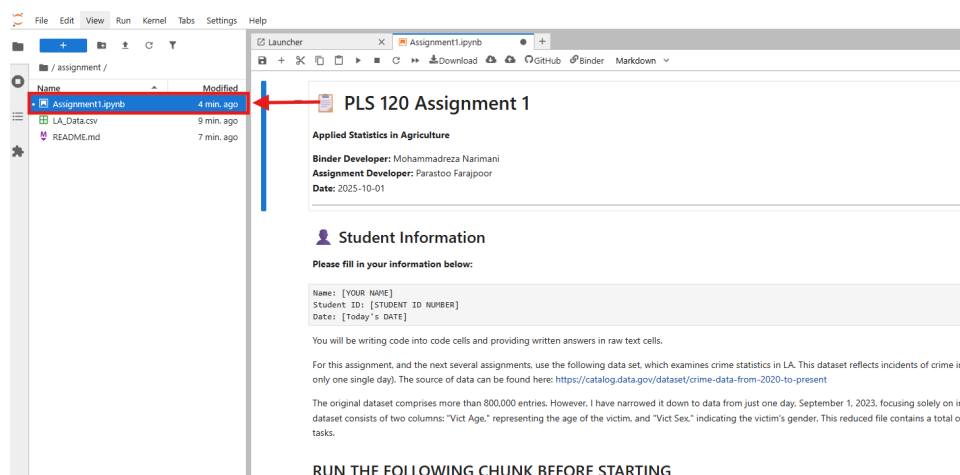# Completing Assignments

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

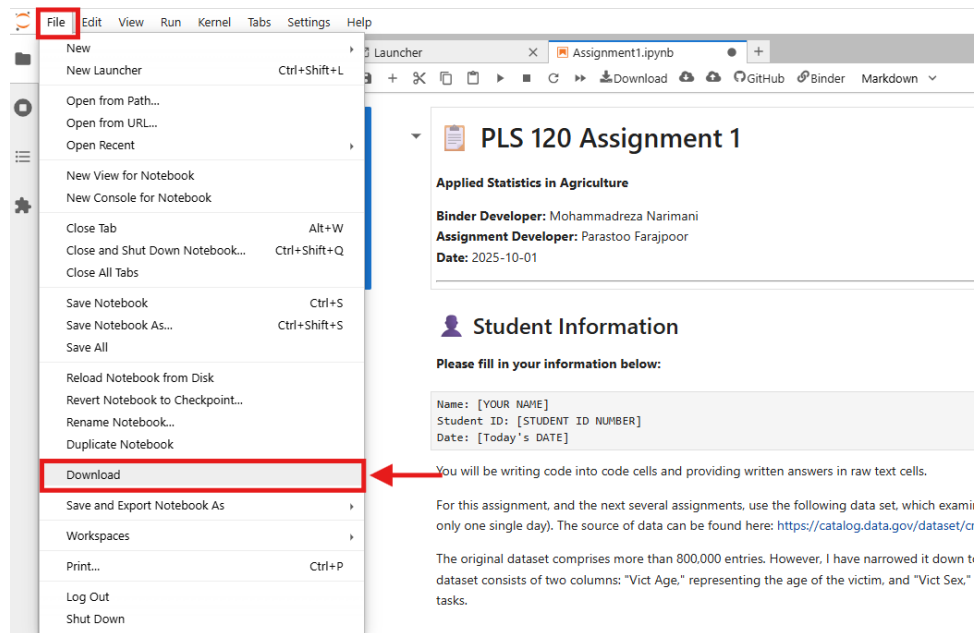## Step 3: Complete Your Work

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

6.4.1 Download Code File (.ipynb)

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

Download your .ipynb file for backup

6.4.2 Export HTML/PDF Report

For submission, you also need an HTML or PDF report:

Click **File → Save and Export Notebook As → HTML** (or PDF)
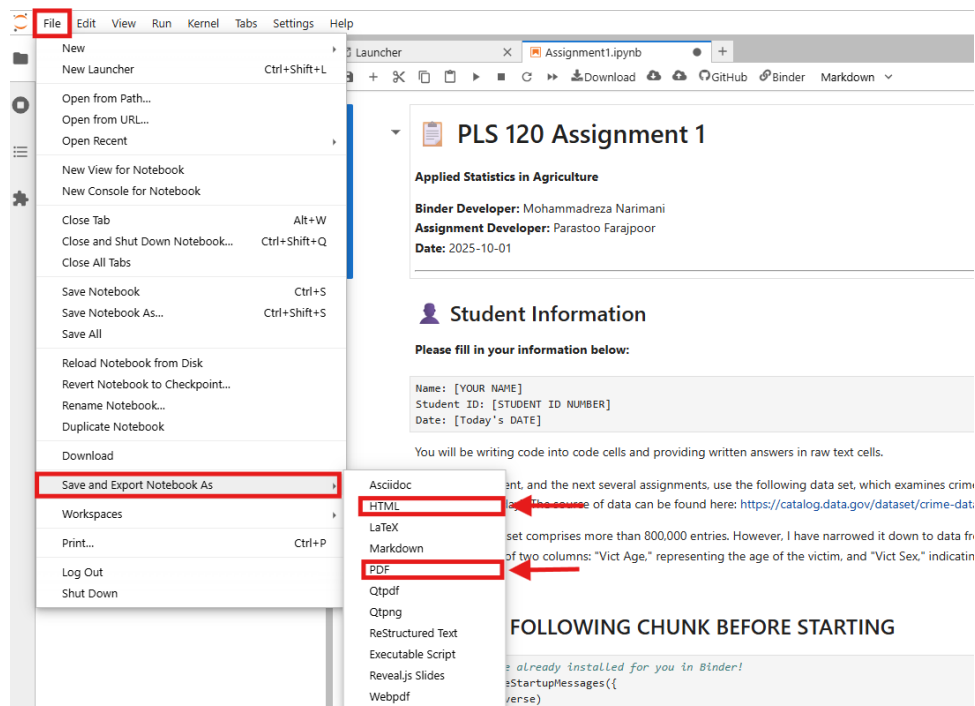
Export your completed assignment as HTML or PDF

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!