



College of Engineering & Applied Sciences

CSPB 3022

Introduction To Data Science With Probability And Statistics

Class Notes

UNIVERSITY OF COLORADO

2024

| Sections | | | |
|---|---|---|---|
| Data Science Lifecycle, Python And Pandas . | 2 | 3.0.3 Assignments | 5 |
| 1.0.1 Piazza | 2 | 3.0.4 Quiz | 5 |
| 1.0.2 Lectures | 2 | Visualization And Introduction To Probability | |
| 1.0.3 Assignments | 3 | 6 | |
| 1.0.4 Quiz | 3 | 4.0.1 Piazza | 6 |
| Pandas, Exploring And Cleaning Tabular | | 4.0.2 Lectures | 6 |
| Data | 4 | 4.0.3 Assignments | 6 |
| 2.0.1 Piazza | 4 | 4.0.4 Quiz | 6 |
| 2.0.2 Lectures | 4 | Probability: Independence, Simulation, | |
| 2.0.3 Assignments | 4 | Random Variables | 7 |
| 2.0.4 Quiz | 4 | 5.0.1 Piazza | 7 |
| Exploratory Data Analysis And Visualization | | 5.0.2 Lectures | 7 |
| 5 | | 5.0.3 Assignments | 7 |
| 3.0.1 Piazza | 5 | 5.0.4 Quiz | 7 |
| 3.0.2 Lectures | 5 | | |

Week 1: (1/15 - 1/21)

Data Science Lifecycle, Python And Pandas

1.0.1 Piazza

Must post / respond to two Piazza posts. (1/23/24)

1.0.2 Lectures

The lecture videos for this week are:

- Course Overview \approx 54 min.
- Pandas Part 1 \approx 54 min.
- Pandas Part 2 \approx 54 min.
- Python Walkthrough \approx 47 min.
- Learning to Use Jupyter Notebooks \approx 9 min.
- Using Markdown In Jupyter Notebooks \approx 11 min.
- Writing Mathematics In Jupyter Notebooks \approx 16 min.
- Beginning Python \approx 44 min.
- Python - Basic NumPy \approx 18 min.
- Quick Calculus Refresher \approx 21 min.

The lecture notes for this week are:

- Course Overview Data Science Lifecycle
- Pandas Part 1
- Pandas Part 2
- L^AT_EX

1.0.3 Assignments

The assignment for this week is:

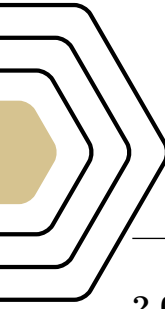
- The assignment for this week is **Data Science Lifecycle, Python And Pandas**. (1/23/24)

1.0.4 Quiz

The quizzes for this week are:

- Math Concept Quiz • Finalized Math Concept Quiz (1/30/24)





Pandas, Exploring And Cleaning Tabular Data

2.0.1 Piazza

Must post / respond to two Piazza posts. (1/30/24)

2.0.2 Lectures

The lecture videos for this week are:

- Pandas Part 3 \approx 54 min.
- Pandas Part 4 \approx 54 min.
- Discussion 2 Video Walkthrough: Basics with Pandas and In-Depth with NumPy \approx 73 min.

The lecture notes for this week are:

- Pandas Part 3
- Pandas Part 4
- Permutations And Combinations
- Section 7.1 Intro To Discrete Probability
- Section 7.2 Probability Theory And Applications

2.0.3 Assignments

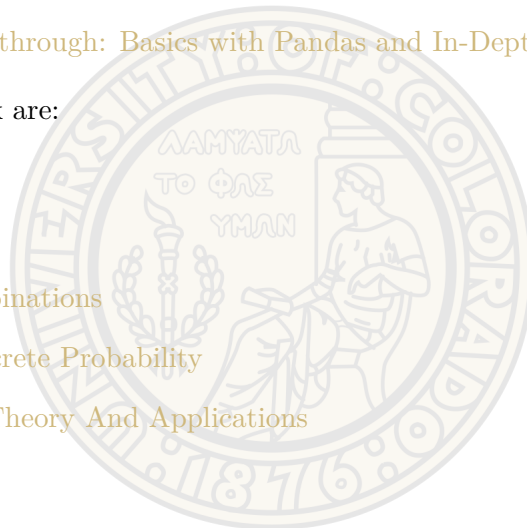
The assignment for this week is:

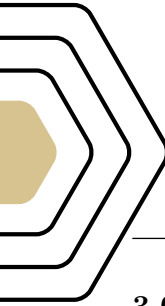
- The assignment for this week is **Pandas, Exploring And Cleaning Tabular Data**. (1/30/24)

2.0.4 Quiz

The quizzes for this week are:

- Python And Pandas Quiz • Finalized Python And Pandas Quiz (1/30/24)





Exploratory Data Analysis And Visualization

3.0.1 Piazza

Must post / respond to two Piazza posts. (2/6/24)

3.0.2 Lectures

The lecture videos for this week are:

- Lecture 6: Data Wrangling And EDA \approx 54 min.
- Lecture 7: EDA And Visualization \approx 54 min.
- Lecture 8: Quiz Walkthrough And Visualization \approx 54 min.
- Discussion 3: More With Pandas \approx 50 min.

The lecture notes for this week are:

- Pandas Part 4
- Exploratory Data Analysis
- Visualization

3.0.3 Assignments

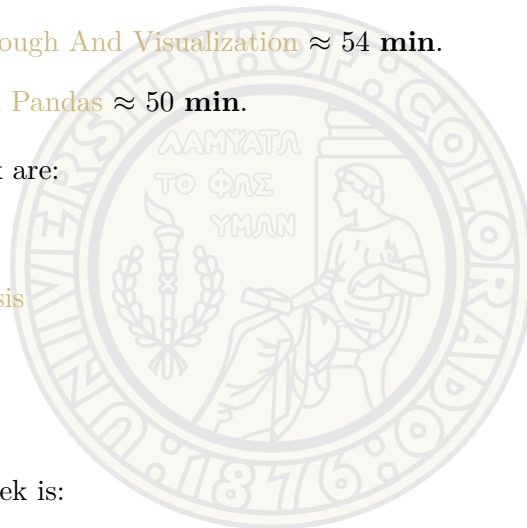
The assignment for this week is:

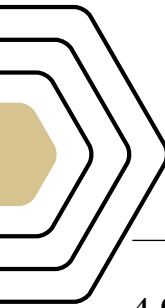
- The assignment for this week is **Exploratory Data Analysis And Visualization**. (2/6/24)

3.0.4 Quiz

The quizzes for this week are:

- Math And Pandas Quiz • Finalized Math And Pandas Quiz (2/6/24)





Visualization And Introduction To Probability

4.0.1 Piazza

Must post / respond to two Piazza posts. (2/13/24)

4.0.2 Lectures

The lecture videos for this week are:

- Visualization and Introduction to Probability \approx 54 min.
- Probability Part 1 \approx 54 min.
- Quiz Walkthrough; Probability \approx 54 min.
- Bike Sharing EDA and Visualization \approx 49 min.

The lecture notes for this week are:

- Intro To Probability Lecture Notes
- Probability II - Total Probability, Bayes Rule And Independence Lecture Notes

4.0.3 Assignments


The assignment for this week is:

- The assignment for this week is **Visualization And Introduction To Probability**. (2/13/24)

4.0.4 Quiz

The quizzes for this week are:

- Quiz 4 • Finalized Quiz 4 (2/13/24)



Probability: Independence, Simulation, Random Variables

5.0.1 Piazza

Must post / respond to two Piazza posts. (2/20/24)

5.0.2 Lectures

The lecture videos for this week are:

- Probability Cont. Independence And Simulation ≈ 54 min.
- Probability Cont. Independence And Simulation Jupyter Notebook Examples ≈ 27 min.
- Random Simulation Example ≈ 45 min.
- Independence Cont. Discrete Random Variables ≈ 54 min.
- Quiz Walkthrough, Common Discrete RVs, Expectation ≈ 54 min.

The lecture notes for this week are:

- Independence Lecture Notes
- Discrete Random Variables Lecture Notes
- Expected Value And Variance Lecture Notes

5.0.3 Assignments

The assignment for this week is:

- The assignment for this week is **Probability: Independence, Simulation, Random Variables.** (2/20/24)

5.0.4 Quiz

The quizzes for this week are:

Quiz 5 • Finalized Quiz 5 (2/20/24)