Teaching AI and ML over a seven-day course can be an exciting and rewarding experience. Since you need to create PPT slides and are starting from scratch, I'll guide you through the process of preparing for each lecture, including the key points to cover and resources you might need.

### Day 1: Introduction to AI and ML

\*\*Objective:\*\* Introduce the concepts of AI and ML, their applications, and basic terminology.

1. \*\*What is AI?\*\*

- Definition of Artificial Intelligence.

- Brief history and evolution of AI.

- Applications of AI (e.g., healthcare, finance, robotics, etc.).

2. \*\*What is Machine Learning?\*\*

- Definition of Machine Learning.

- Difference between AI and ML.

- Types of ML: Supervised, Unsupervised, and Reinforcement Learning.

3. \*\*Real-world Examples\*\*

- Examples of AI and ML in everyday life (e.g., recommendation systems, speech recognition).

4. \*\*Basic Terminology\*\*

- Algorithms, models, training data, features, labels.

\*\*Resources:\*\*

- Introductory articles on AI and ML.

- Example videos or animations demonstrating AI applications.

### Day 2: Python for Data Science

\*\*Objective:\*\* Introduce Python programming and its relevance to data science.

1. \*\*Why Python?\*\*

- Popularity in the data science community.

- Libraries and tools (e.g., NumPy, pandas, Matplotlib).

2. \*\*Basic Python Syntax\*\*

- Variables, data types, basic operations.

- Control structures: loops and conditionals.

3. \*\*Libraries for Data Science\*\*

- Introduction to NumPy for numerical operations.

- Introduction to pandas for data manipulation.

- Basic plotting with Matplotlib.

4. \*\*Simple Examples\*\*

- Loading data with pandas.

- Performing basic data operations.

\*\*Resources:\*\*

- Python documentation and tutorials.

- Online platforms like Codecademy or W3Schools for Python basics.

### Day 3: Data Handling

\*\*Objective:\*\* Teach students how to handle and preprocess data using Python.

1. \*\*Data Importing\*\*

- Reading data from various sources (CSV, Excel, SQL).

2. \*\*Data Cleaning\*\*

- Handling missing values.

- Removing duplicates.

- Data normalization and standardization.

3. \*\*Exploratory Data Analysis (EDA)\*\*

- Descriptive statistics.

- Data visualization techniques.

4. \*\*Practical Examples\*\*

- Hands-on with a dataset: cleaning and EDA.

\*\*Resources:\*\*

- Kaggle datasets for practice.

- Tutorials on data cleaning and EDA.

### Day 4: Introduction to ML

\*\*Objective:\*\* Provide an overview of machine learning processes and workflows.

1. \*\*ML Workflow\*\*

- Data collection and preprocessing.

- Model selection and training.

- Model evaluation and tuning.

- Deployment and monitoring.

2. \*\*Supervised vs Unsupervised Learning\*\*

- Differences and examples.

- Common algorithms for each type.

3. \*\*Basic ML Terminology\*\*

- Training set, test set, validation set.

- Overfitting and underfitting.

4. \*\*Simple Examples\*\*

- Train a simple ML model using scikit-learn.

\*\*Resources:\*\*

- Scikit-learn documentation.

- Online tutorials on basic ML workflows.

### Day 5: Linear Regression

\*\*Objective:\*\* Teach the fundamentals of linear regression.

1. \*\*What is Linear Regression?\*\*

- Definition and purpose.

- Mathematical formulation (y = mx + b).

2. \*\*Assumptions of Linear Regression\*\*

- Linearity, independence, homoscedasticity, normality.

3. \*\*Model Training and Evaluation\*\*

- Using scikit-learn to train a linear regression model.

- Interpreting coefficients.

- Evaluating model performance (R^2 score, RMSE).

4. \*\*Practical Examples\*\*

- Hands-on training of a linear regression model on a dataset.

\*\*Resources:\*\*

- Scikit-learn linear regression example.

- Articles on linear regression assumptions and evaluation metrics.

### Day 6: Logistic Regression

\*\*Objective:\*\* Introduce logistic regression for binary classification tasks.

1. \*\*What is Logistic Regression?\*\*

- Definition and purpose.

- Difference from linear regression.

2. \*\*Mathematical Background\*\*

- Sigmoid function.

- Odds and log-odds.

3. \*\*Model Training and Evaluation\*\*

- Using scikit-learn to train a logistic regression model.

- Confusion matrix, precision, recall, F1 score, ROC curve.

4. \*\*Practical Examples\*\*

- Training a logistic regression model on a binary classification dataset.

\*\*Resources:\*\*

- Scikit-learn logistic regression example.

- Articles on classification metrics.

### Day 7: Decision Trees

\*\*Objective:\*\* Explain decision trees and their applications.

1. \*\*What is a Decision Tree?\*\*

- Definition and purpose.

- How decision trees work (splits, nodes, leaves).

2. \*\*Building a Decision Tree\*\*

- Criteria for splits (Gini impurity, entropy).

- Overfitting and pruning.

3. \*\*Model Training and Evaluation\*\*

- Using scikit-learn to train a decision tree model.

- Visualizing a decision tree.

- Evaluating model performance.

4. \*\*Practical Examples\*\*

- Training and visualizing a decision tree on a dataset.

\*\*Resources:\*\*

- Scikit-learn decision tree example.

- Articles on decision tree theory and visualization techniques.

### Creating PPT Slides

For each day, create slides with the following structure:

1. \*\*Title Slide\*\*: Topic and date.

2. \*\*Overview Slide\*\*: Brief summary of what will be covered.

3. \*\*Content Slides\*\*: Detailed explanation of each point (use bullet points, images, graphs).

4. \*\*Example Slides\*\*: Code snippets, hands-on examples, and visualizations.

5. \*\*Summary Slide\*\*: Recap of key points covered.

6. \*\*Q&A Slide\*\*: Time for students to ask questions.

### Tips for Effective Teaching on Zoom

- \*\*Engage Students\*\*: Ask questions, encourage participation, and use polls.

- \*\*Use Visuals\*\*: Diagrams, charts, and code snippets to illustrate concepts.

- \*\*Interactive Examples\*\*: Live coding sessions and walkthroughs.

- \*\*Provide Resources\*\*: Share links to articles, tutorials, and datasets.

- \*\*Record Sessions\*\*: Allow students to review the material later.

By following this structured approach and utilizing the suggested resources, you'll be well-prepared to teach your students the fundamentals of AI and ML effectively. Good luck!