**Chapter 1 Notes**

**Key Concepts:**

1. **Supervised Learning**: Learning from labeled data. Example: Regression and classification models where the model learns from input-output pairs (e.g., predicting housing prices from features like area, number of rooms).
2. **Unsupervised Learning**: Learning from unlabeled data. Example: Clustering (e.g., grouping customers based on purchasing behavior).
3. **Overfitting**: When a model learns too much from the training data, it captures noise instead of the general pattern. It performs well on training data but poorly on new, unseen data.
4. **Underfitting**: When a model is too simple to capture underlying trends in the data. It performs poorly on both training and test data.

**Output Summaries:**

* **Model Coefficients**: In linear regression, the coefficients (slope) represent how much the target variable (y) changes for a unit change in the input variable (X). A coefficient of 3 means that for every 1-unit increase in X, y increases by 3 units.
* **Plots**: Scatter plots help visualize the relationship between features (X) and the target variable (y). A straight line in linear regression indicates the best fit. Look at how the model predictions align with the actual data points to check for overfitting or underfitting.