# 2.2. Student Handout

# AutoML in Power BI: Student Handout

## Introduction to AutoML in Power BI

**Overview:**

- AutoML (Automated Machine Learning) automates the process of applying machine learning to real-world problems.
- Power BI integrates AutoML, allowing users to create, train, and deploy machine learning models directly within the platform.

## Overview of Power BI and Machine Learning Integration

**Key Points:**

- Power BI is known for data visualization and reporting.
- With AutoML, Power BI can predict trends, classify data, and make data-driven decisions.
- Integration with Azure Machine Learning and Power BI Dataflows enables these capabilities.

## Use Cases for Machine Learning in Power BI

**Examples:**

1. **Sales Forecasting:** Predict future sales based on historical data.
2. **Customer Segmentation:** Classify customers into segments based on behavior.
3. **Churn Prediction:** Identify customers likely to stop using a product or service.
4. **Anomaly Detection:** Detect unusual patterns, such as fraudulent transactions.

# Creating and Training a Machine Learning Model in Power BI

## Step 1: Setting Up the Environment for Machine Learning in Dataflows

- Use Dataflows to prepare and transform data before applying machine learning.

## Step 2: Choosing the Right Algorithm

**Examples:**

1. **Classification:** Categorize data into groups, e.g., "likely to churn" vs. "not likely to churn."
2. **Regression:** Predict continuous values, e.g., future sales.
3. **Clustering:** Group similar data points, e.g., customer segments.

## Step 3: Configuring Training Options

- **Train/Test Split:** Divide data into training and testing sets.
- **Hyperparameters:** Adjust settings that control model learning.
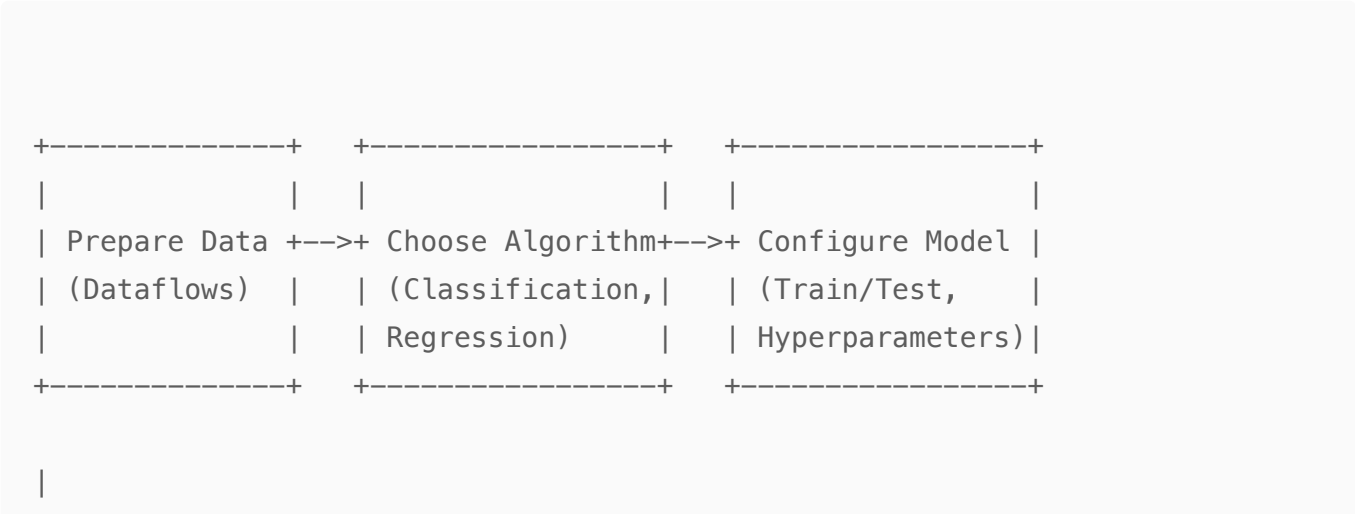
# Hands-On: Building and Training a Machine Learning Model on a Dataflow Entity

**Steps:**

1. **Create a Dataflow:** Connect to data sources and prepare data.
2. **Select the Machine Learning Option:** Use Power BI interface to create a model.
3. **Choose the Algorithm:** Select based on the problem (e.g., classification for churn prediction).
4. **Configure Training Options:** Set train/test split and hyperparameters.
5. **Train the Model:** Power BI trains the model and provides performance metrics.
6. **Evaluate the Model:** Assess performance using test data.
7. **Deploy the Model:** Use the model for predictions in reports and dashboards.

# Diagrams

**Process Overview:**

```
+--------------+   +----------------+   +----------------+
|              |   |                |   |                |
| Prepare Data +-->+ Choose Algorithm+-->+ Configure Model |
| (Dataflows)  |   | (Classification,|   | (Train/Test,   |
|              |   | Regression)    |   | Hyperparameters)|
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| Train Model |

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| Evaluate Model |

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| Deploy Model |


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## Conclusion

- Creating and training a machine learning model in Power BI involves data preparation, algorithm selection, and model evaluation.
- Power BI's AutoML simplifies the process for non-experts.
- Successful models rely on proper data preparation and algorithm choice.

Feel free to ask questions if you need further clarification!