Practical 8: Azure Machine Learning service for Linear Regression

Azure Machine Learning service, often referred to as Azure ML, is a cloud-based platform provided by Microsoft as part of the Azure cloud ecosystem. It is designed to help data scientists and machine learning professionals build, train, deploy, and manage machine learning models and solutions. Azure ML offers a range of tools and services to streamline the machine learning workflow, from data preparation to model deployment and monitoring.

Here are some key features and capabilities of Azure Machine Learning service:

Workspace: You can create a dedicated workspace to manage your machine learning projects, datasets, models, and experiments. It provides a centralized location for collaboration and organization.

Data Preparation: Azure ML allows you to connect to various data sources, including Azure Data Lake Storage, Azure SQL Database, and more. You can clean, preprocess, and transform data within the platform.

Automated Machine Learning: Azure ML provides AutoML capabilities, which can automate the process of model selection and hyperparameter tuning, making it easier for users without deep machine learning expertise to build effective models.

Model Training: You can leverage Azure ML's cloud-based compute resources to train machine learning models at scale. This includes support for various machine learning frameworks and tools.

Experiment Tracking: The platform allows you to track and version your machine learning experiments, helping you understand the performance of different models and their configurations.

Model Deployment: You can deploy machine learning models as web services or containerized applications. Azure ML makes it easier to take models from the development phase to production.

Model Monitoring: It offers monitoring and logging capabilities to track the performance of deployed models and receive alerts if models drift out of specification.

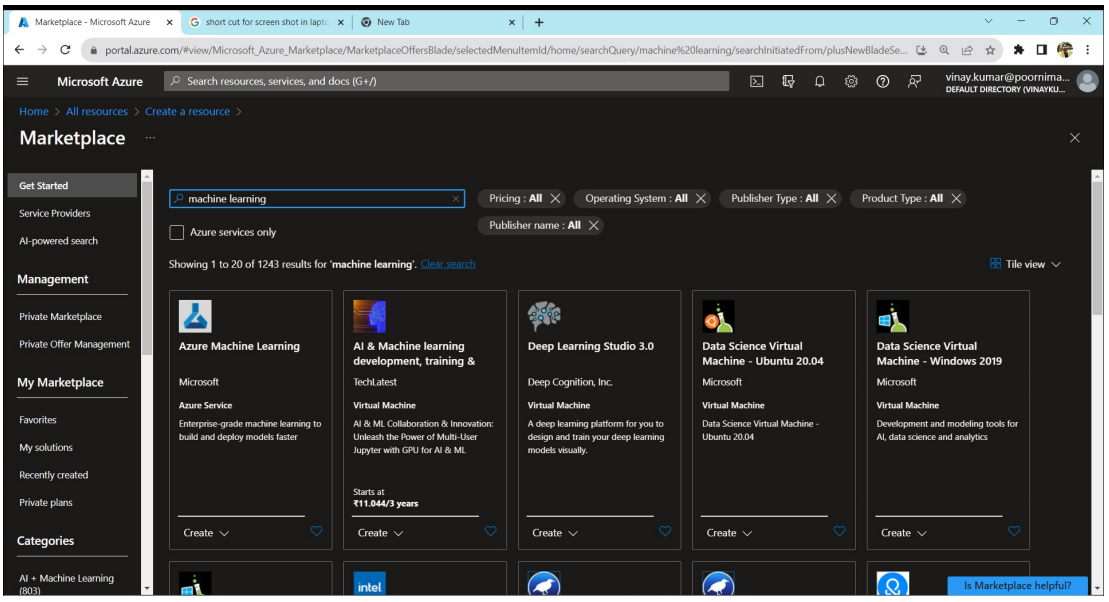
Integration with Azure Services: Azure ML seamlessly integrates with other Azure services, such as Azure Databricks, Azure Kubernetes Service, and more, to create end-to-end machine learning solutions.

Security and Compliance: Azure ML provides robust security features and compliance certifications, making it suitable for a wide range of industries and use cases.

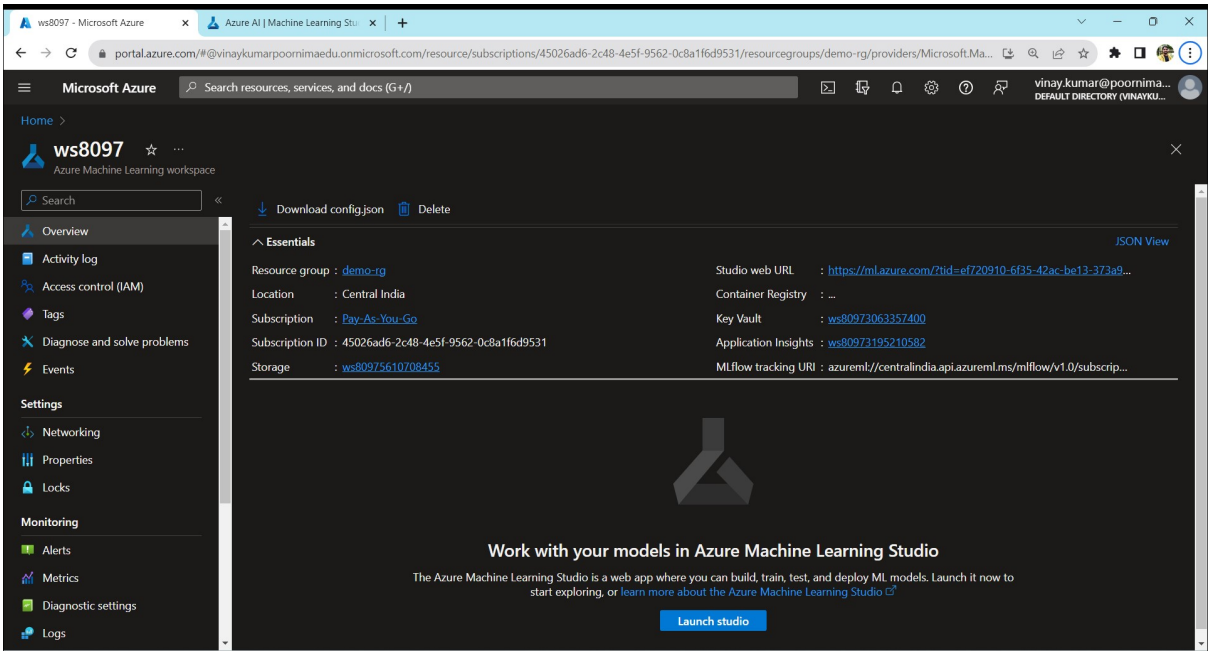
Scalability: With Azure's cloud infrastructure, you can scale your machine learning workloads up or down as needed, making it suitable for both small projects and large-scale, enterprise-level deployments.

Azure Machine Learning service is a versatile platform that caters to data scientists, developers, and business analysts, providing the tools and services needed to build and manage machine learning solutions in a scalable and collaborative environment.

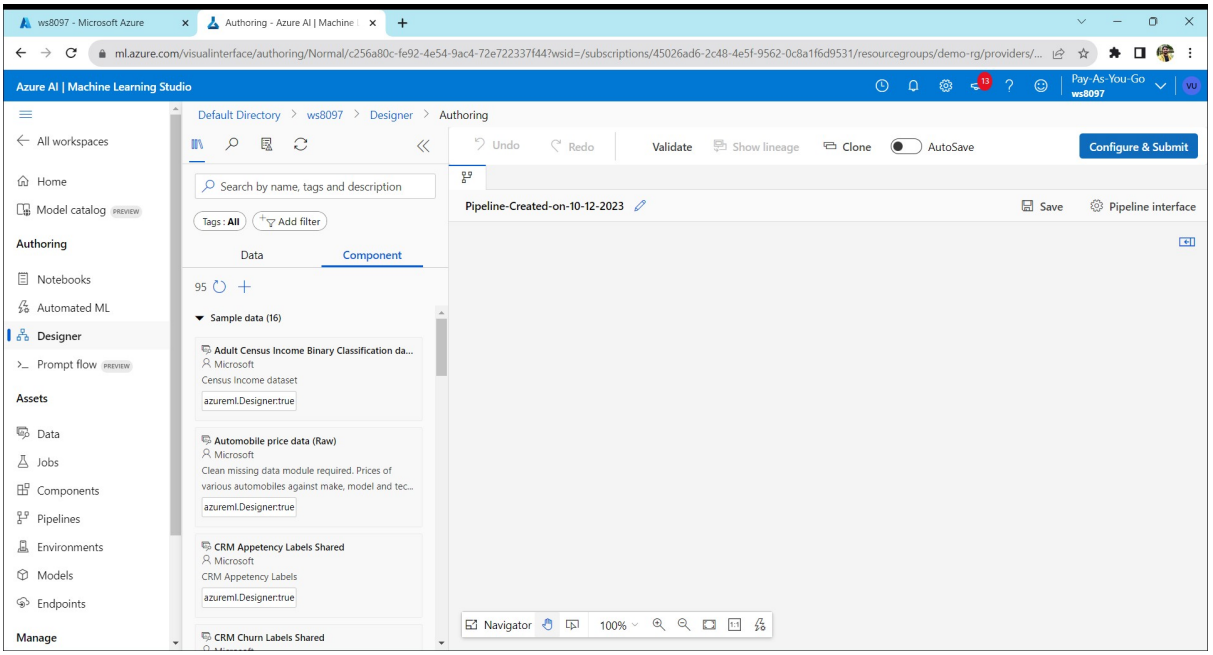
Step 1: Create the Azure ML service



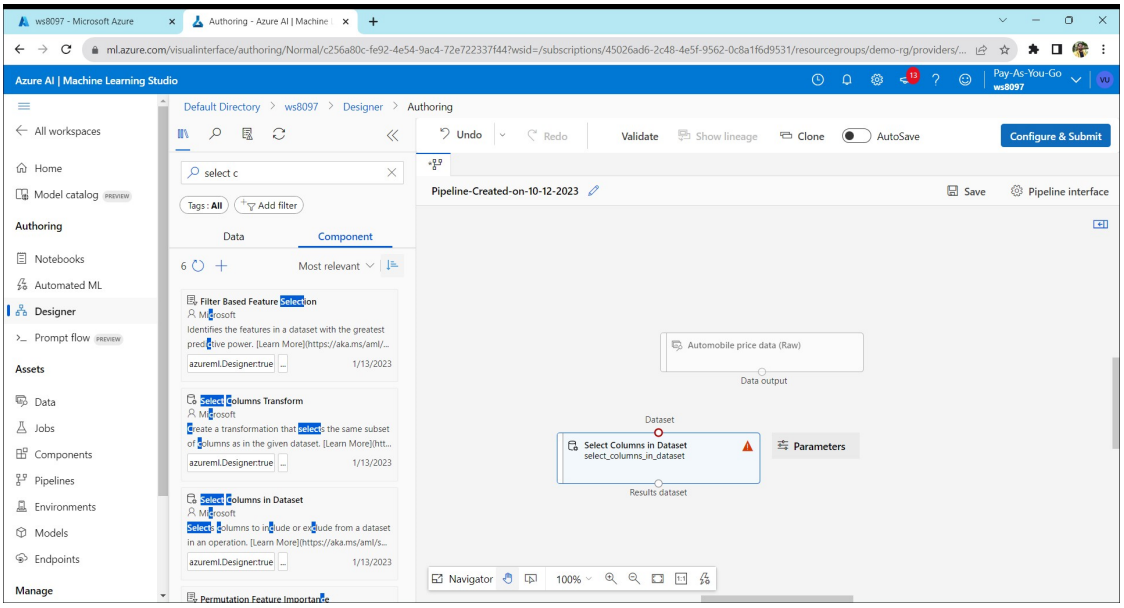
Select Azure Machine Learning and create the service with all default settings. Launch the studio once the service is created.

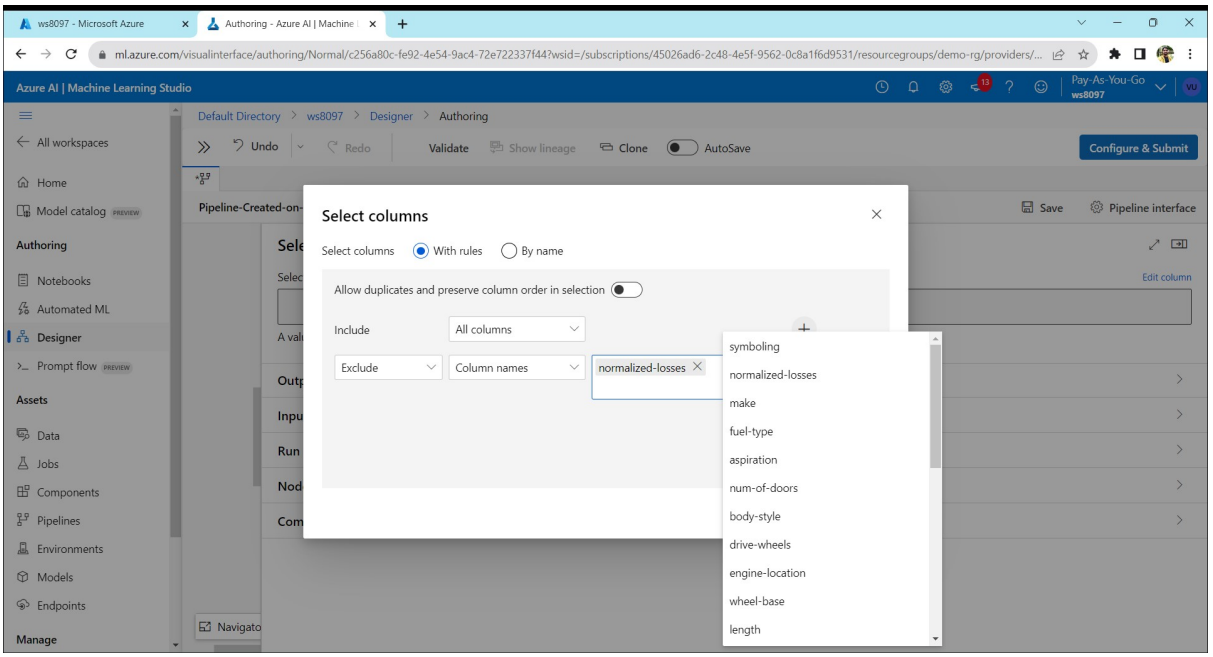


Step 2: Create the pipeline for machine learning. Select the automobile price data which is available in the ML service.

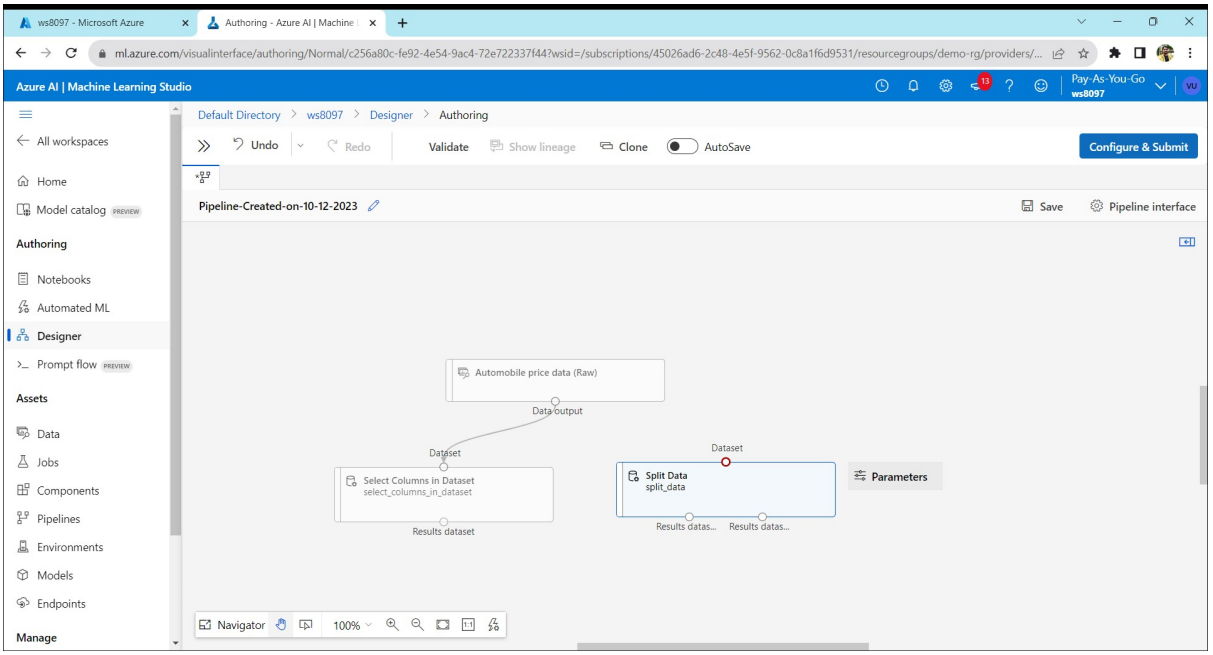


Step 3: Check all the columns and remove any missing valued column. For example, here the normalized losses column has some missing values. We can remove it.

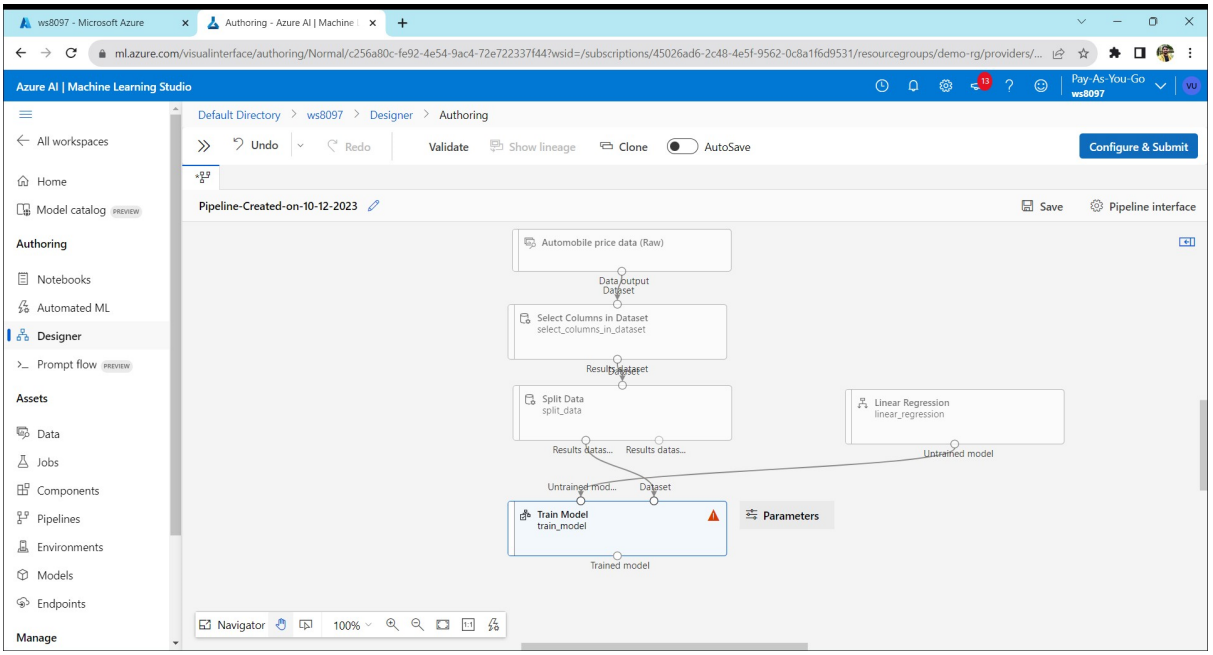




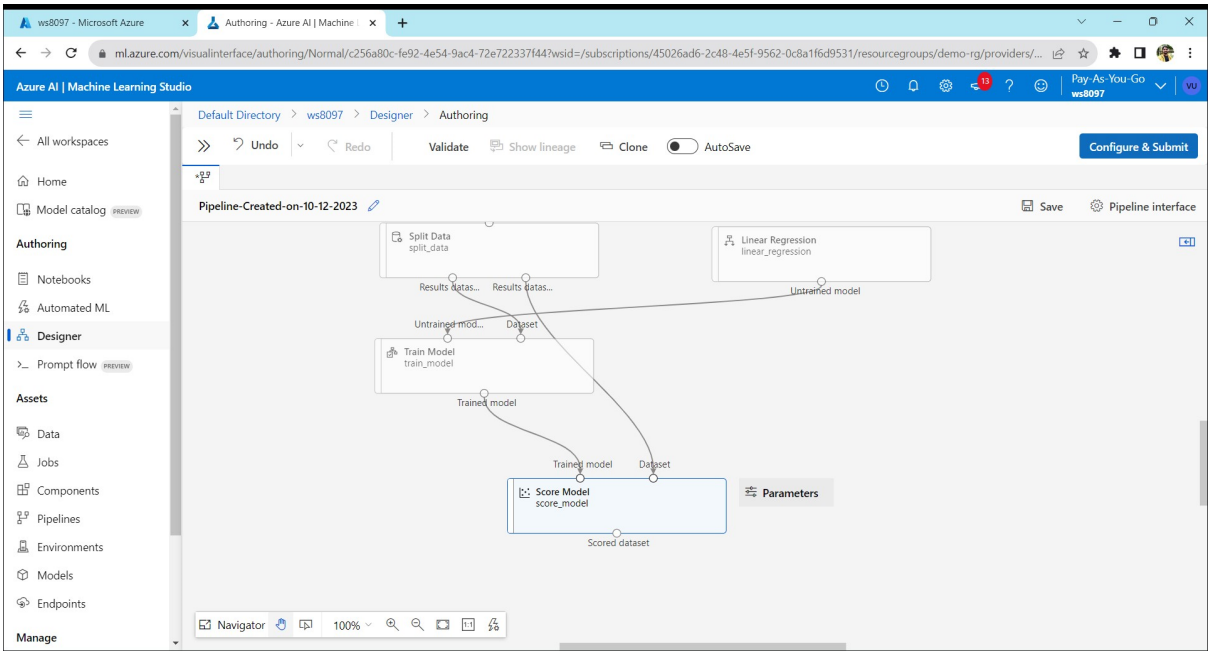
Step 4: Split the data into the train and test set. The ratio generally would be 70 % and 30 %.



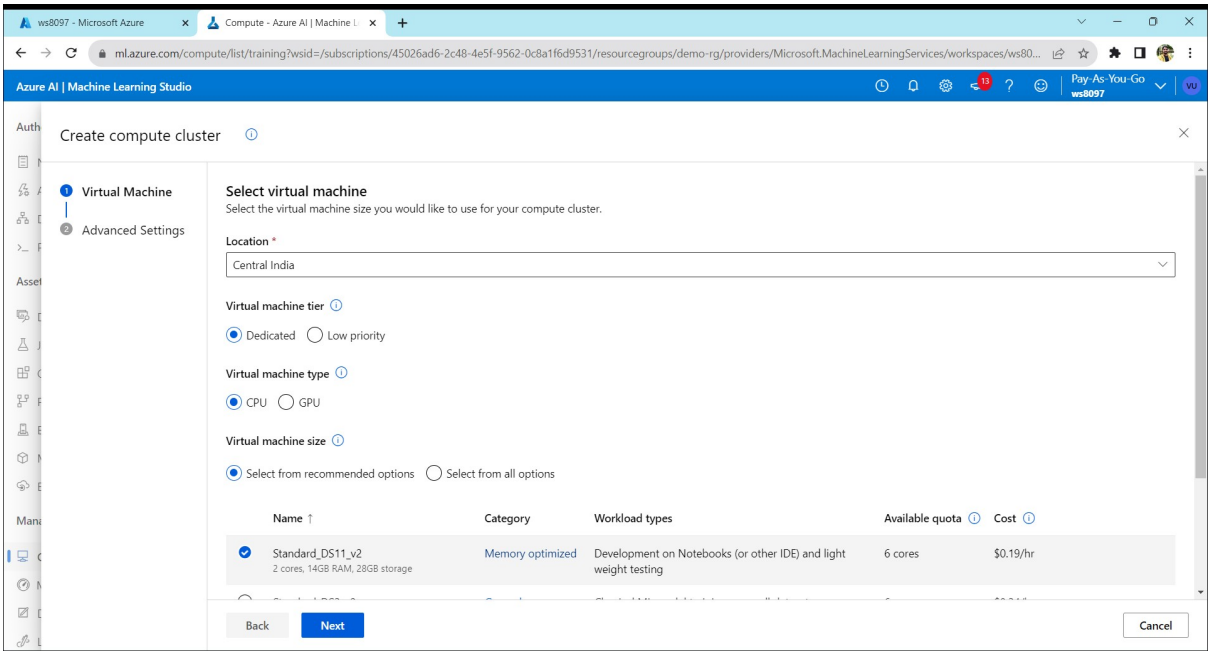
Step 5: Select the appropriate ML algorithm and connect it with the train model. In this case it's Linear regression.



Step 6: Finally select the evaluation metrics for the model to test its accuracy.



Step 7: After the pipeline is built, we need to select a VM as a compute service to run the ML pipeline created.



Azure Machine Learning service is a powerful and comprehensive platform for developing and deploying machine learning solutions, but it may not be the best fit for every use case or every user. Organizations and data scientists should carefully consider their specific needs, technical expertise, and budget constraints when choosing Azure ML or any other machine learning platform.