Azure Machine Learning

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Microsoft

BIG DATA WEEK
A GLOBAL FESTIVAL OF DATA

Agenda

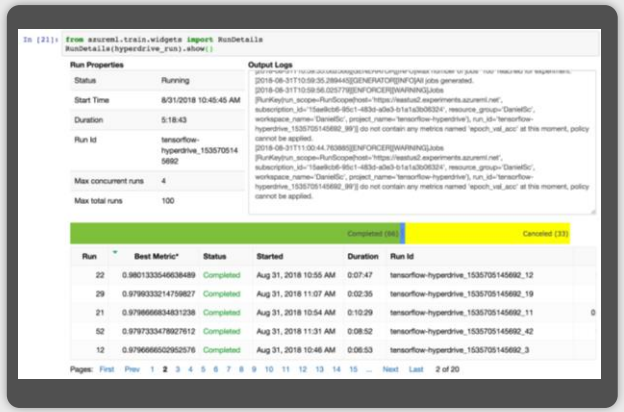
- Azure Machine Learning Services
  - AutoML
  - Notebook VM
  - Visual Interface
- Demo: Jupyter Notebook (local / remote proc)
- Labs: Azure Notebooks

Familiar Data Science tools

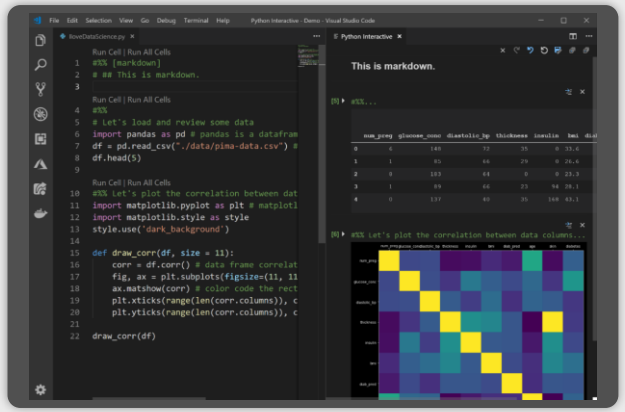
Choose any python development environment

Visual Studio Code | Azure Notebooks | Jupyter | PyCharm | Zeppelin | Command line

And improve data science productivity



Interactive widgets for Jupyter Notebooks



Azure Machine Learning for Visual Studio Code extension

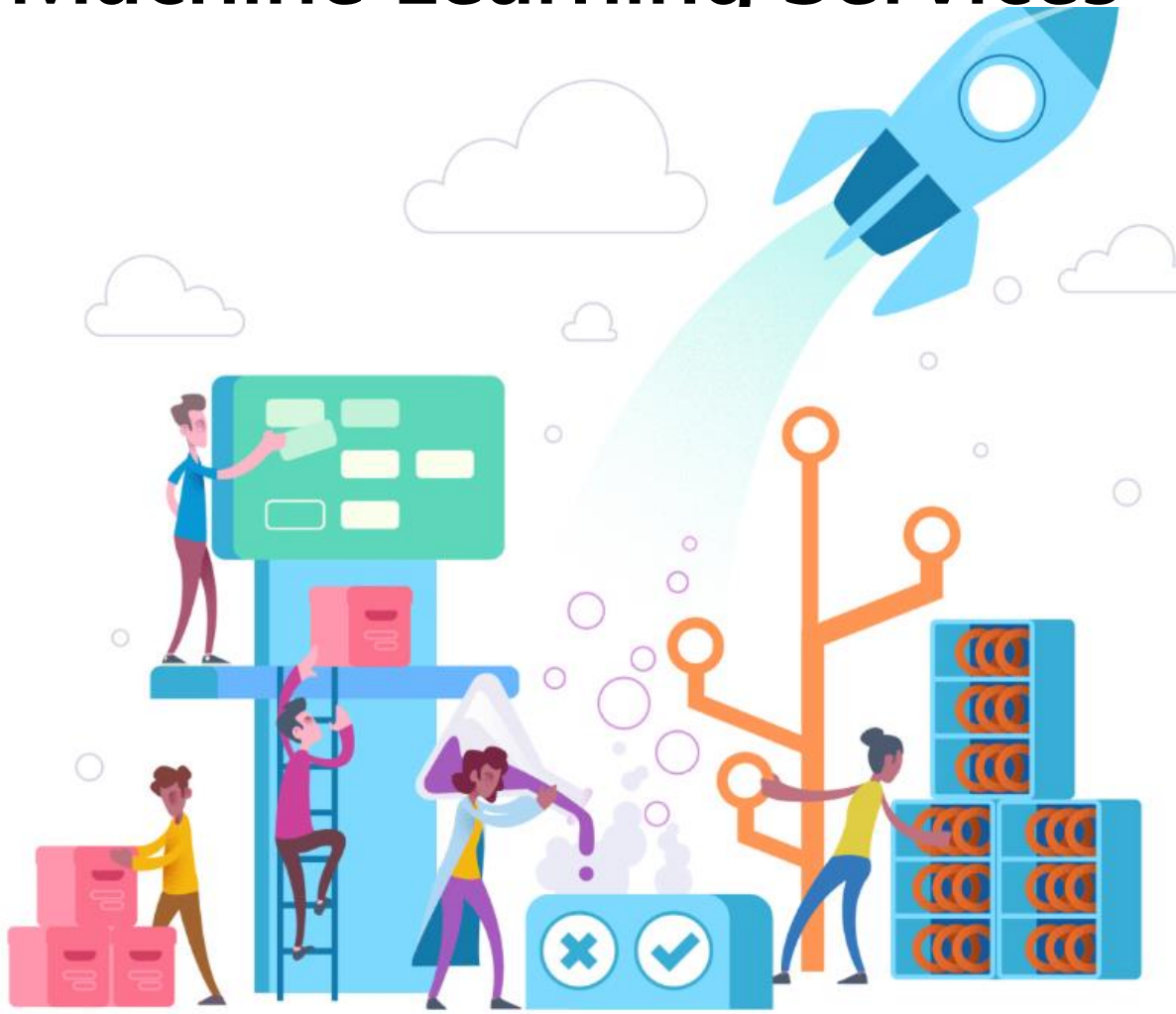
Get started with AML on Azure Notebooks: http://aka.ms/aznotebooks-aml

Authoring Experiences in Azure Machine Learning Services

Azure Machine Learning
Web Experience (Preview)

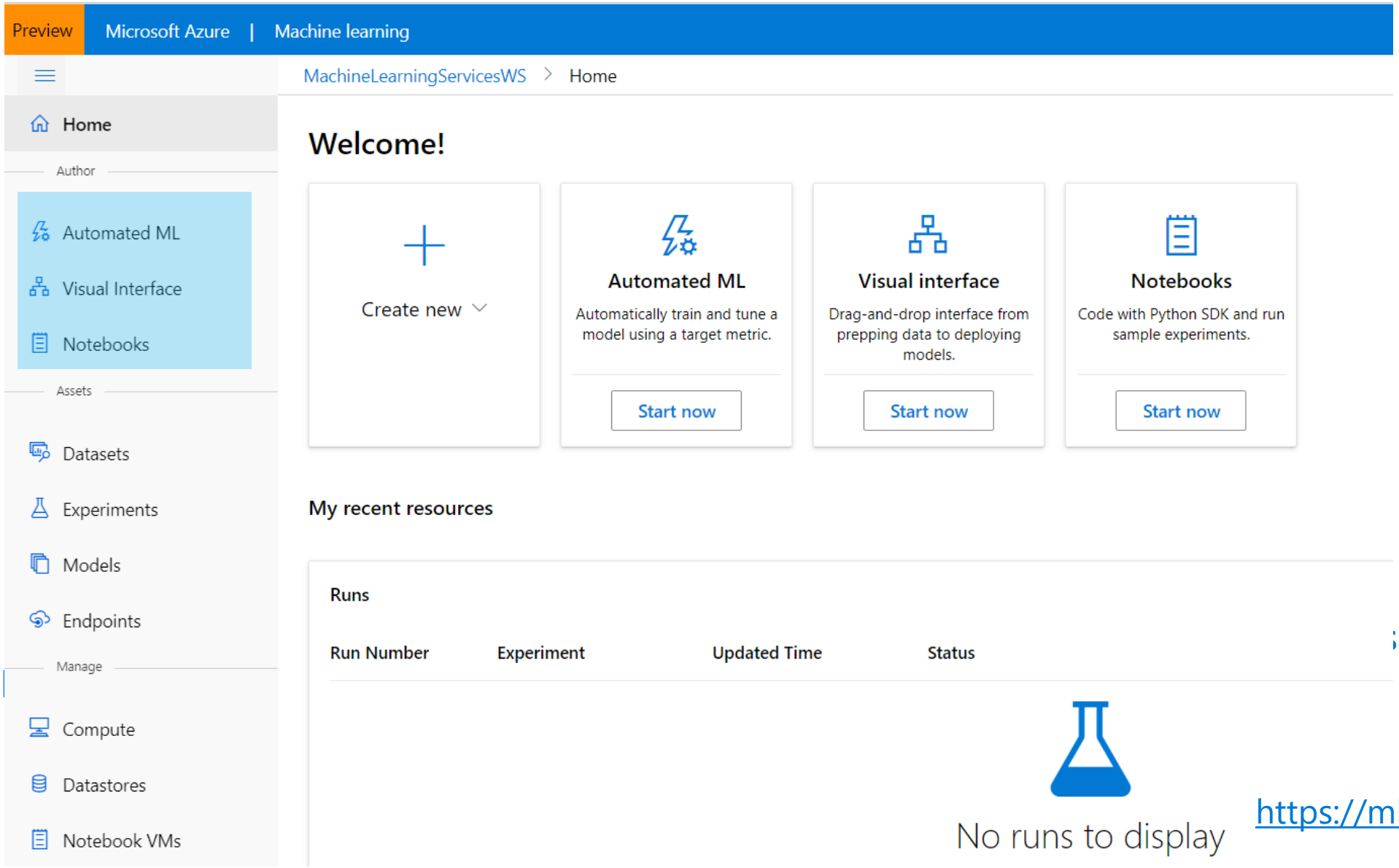
Quickly prep data, train, and deploy machine learning models.
Improve productivity and costs with autoscaling compute and pipelines.

Sign in



https://ml.azure.com

Authoring Experiences in Azure Machine Learning Services



https://ml.azure.com

Authoring Experiences in Azure Machine Learning Services

Automated Machine Learning

Visual Interface

Notebooks

Authoring Experiences in Azure Machine Learning Services

Automated Machine Learning

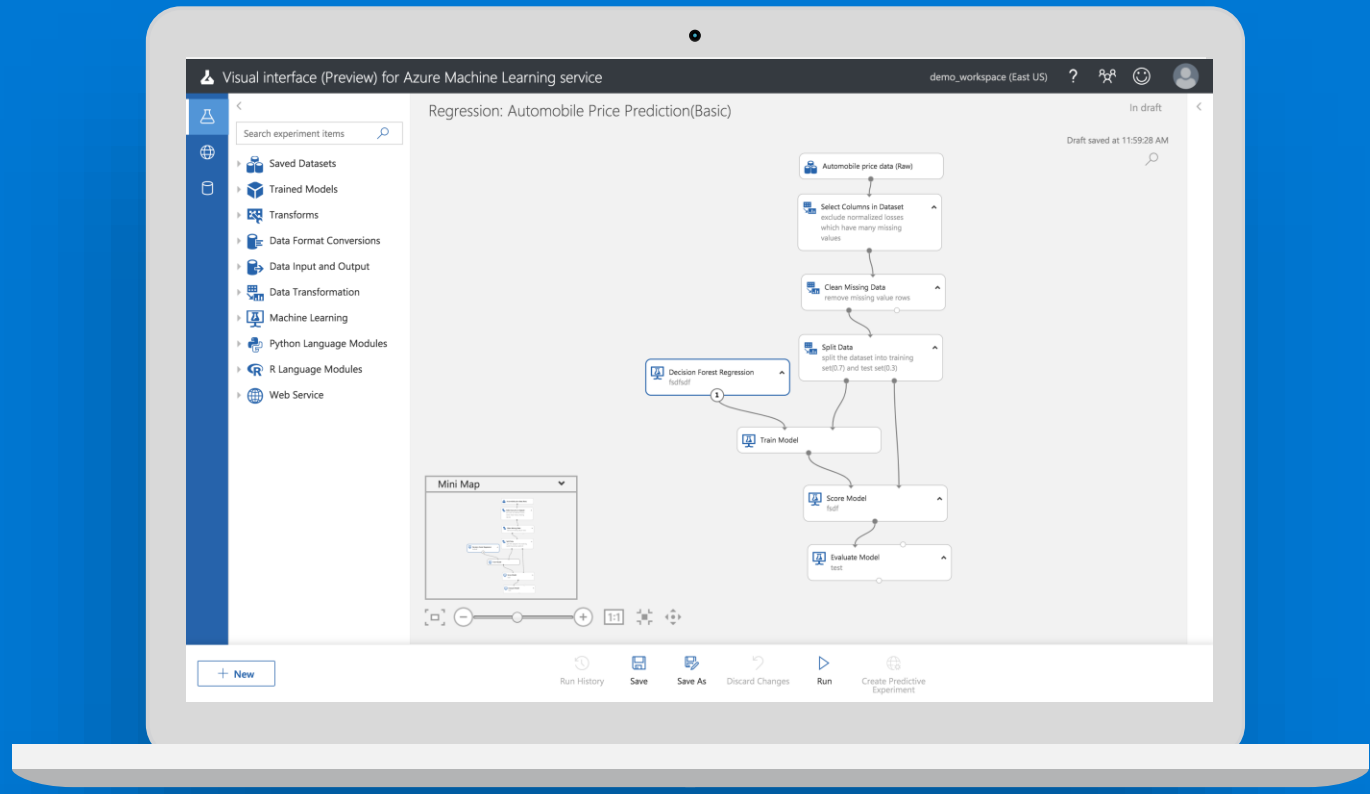
Visual Interface

Notebooks

Visual Interface for Azure Machine Learning service

Visual workflow to build, test, and deploy ML models more easily and efficiently

https://ml.azure.com



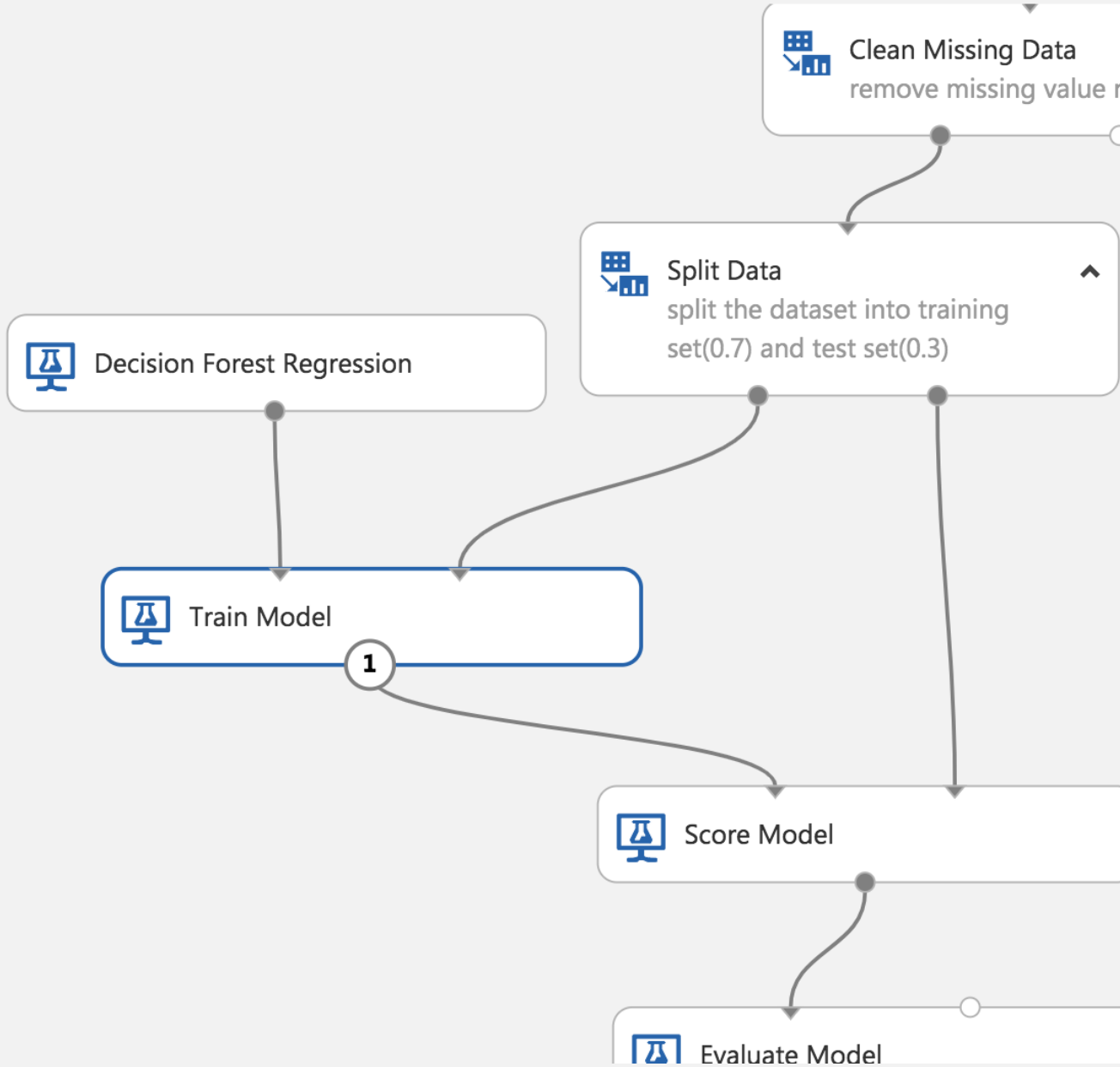
Demo

Visual Interface
for Azure Machine Learning service

https://ml.azure.com

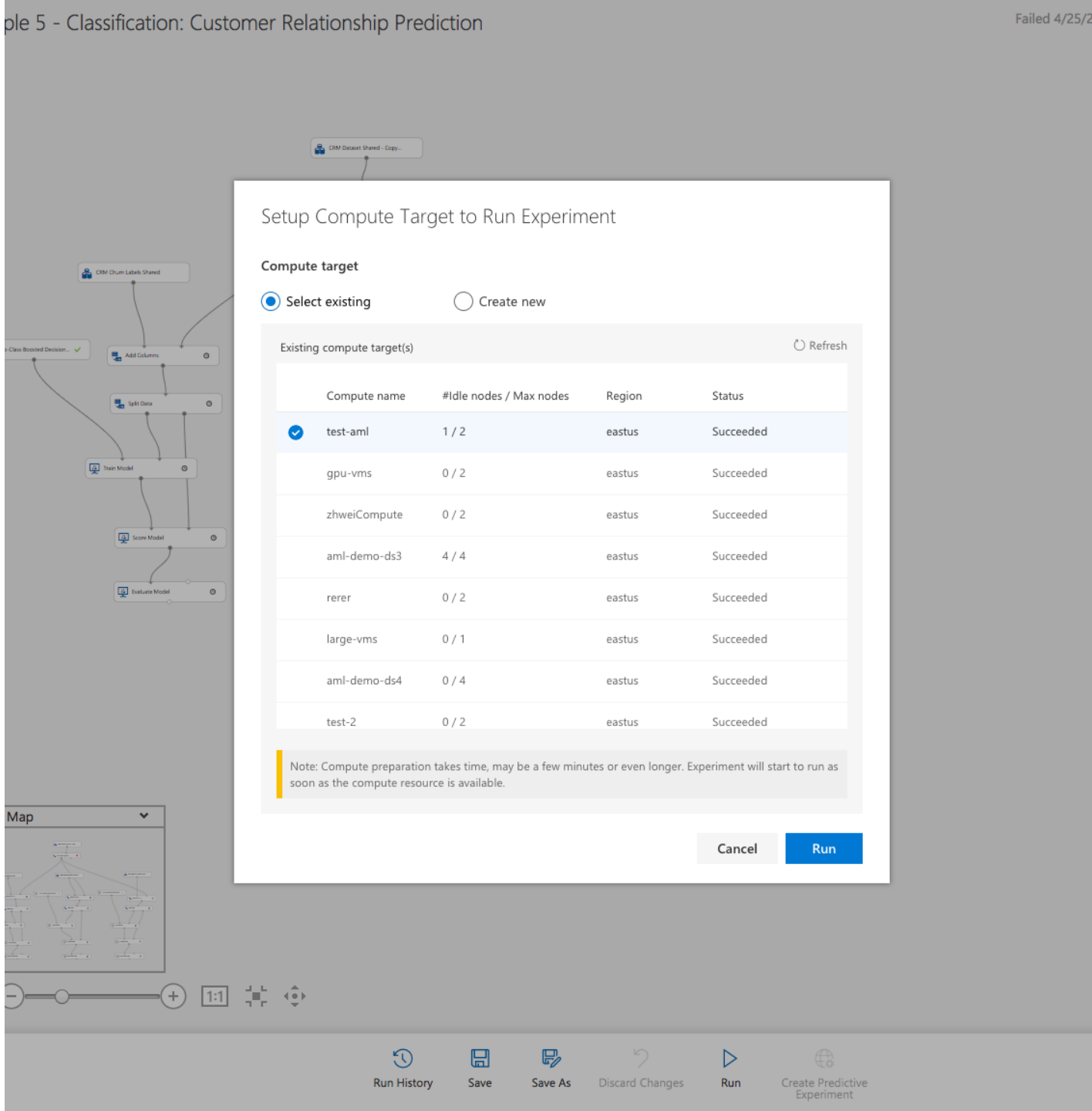
Visual Interface

- Drag-n-drop
- Built-in modules
- Data visualization
- Model evaluation



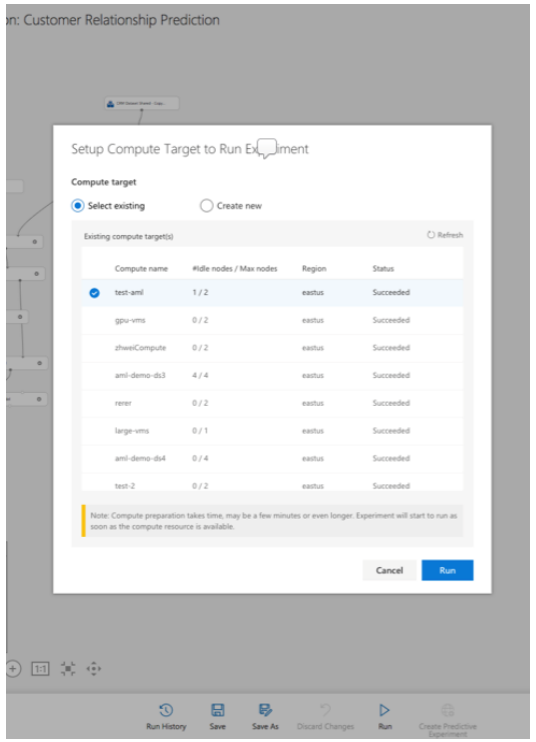
Best from AML service

- Bring your own compute
- Scale align with data growth or model complexity
- Auto cool down for saving cost
- Deploy to your own environment
- Run history & versioning
- Debuggability

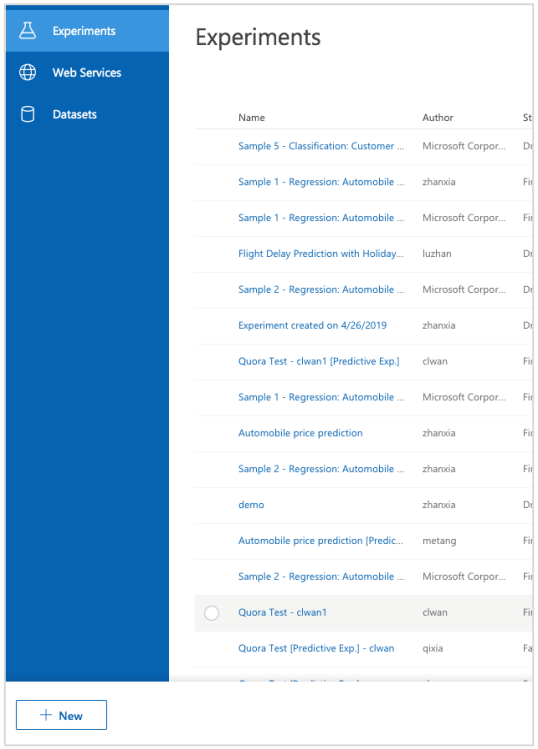


Fully Integrated with AML Service

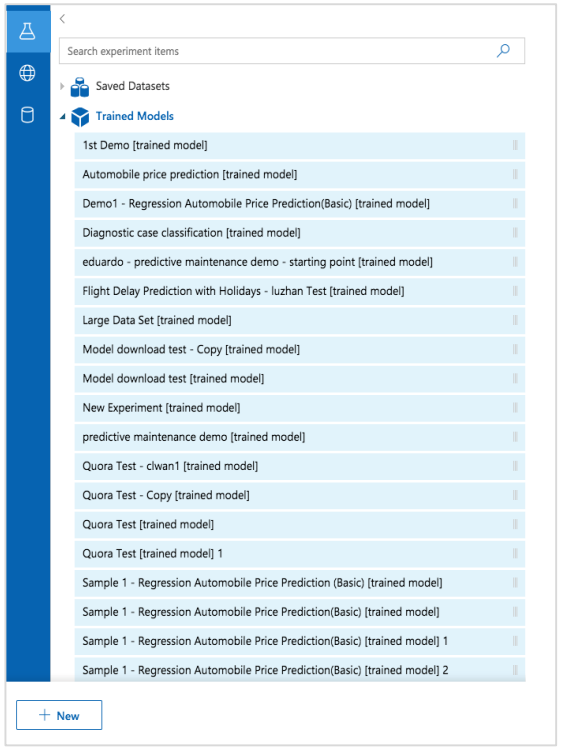
Computes



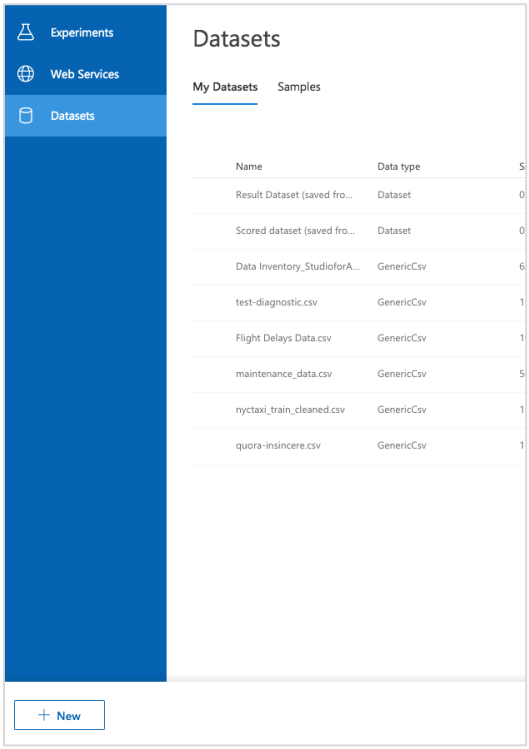
Experiments



Models



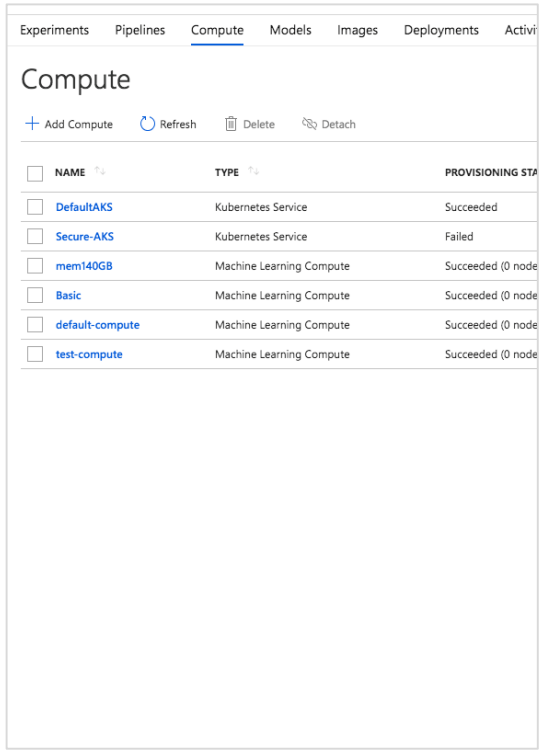
Web Services



Visual Interface

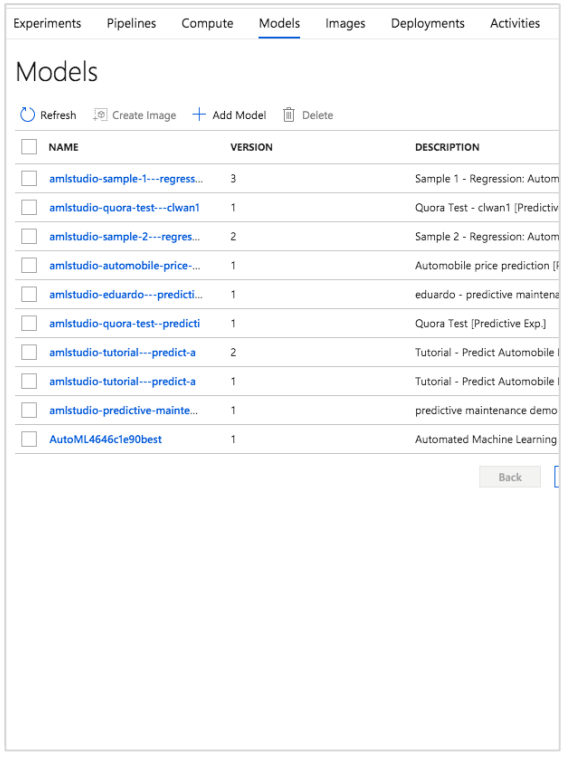
Fully Integrated with AML Service

Computes

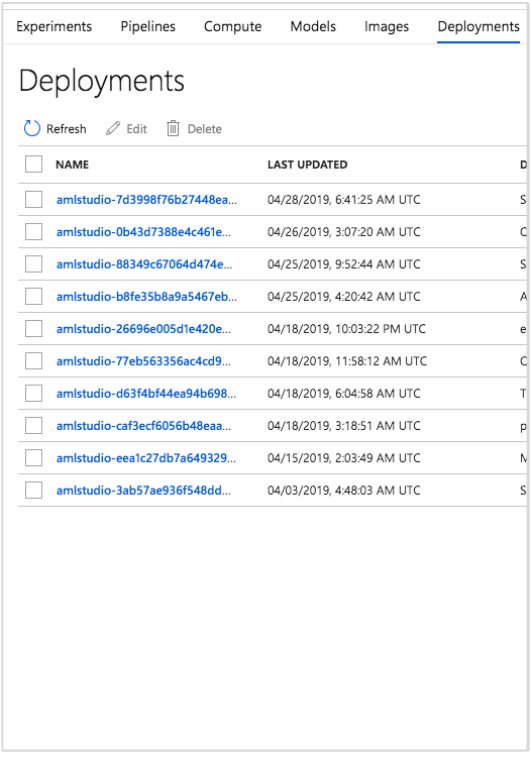


Experiments

Models



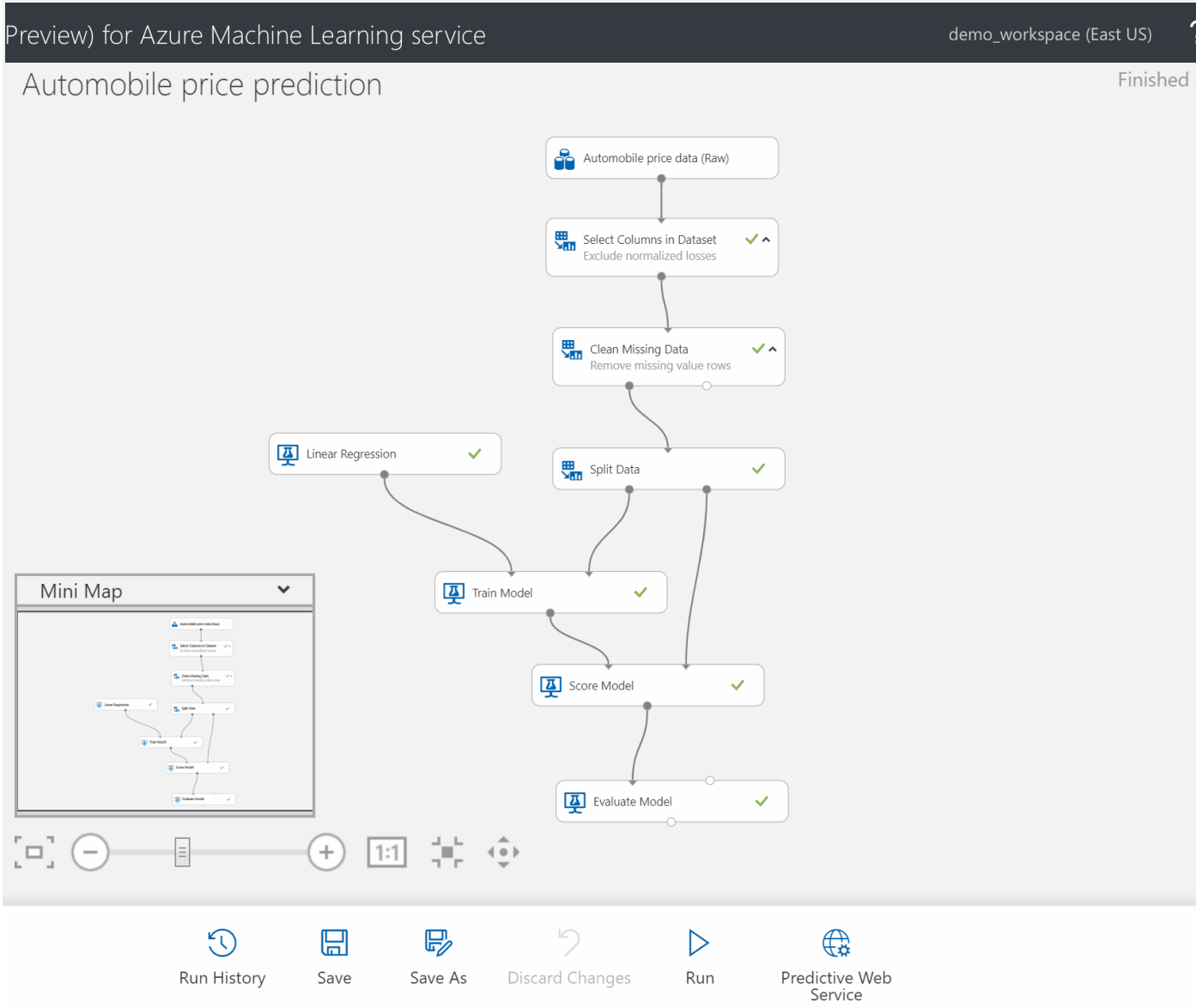
Web Services



AML Service on Azure Portal

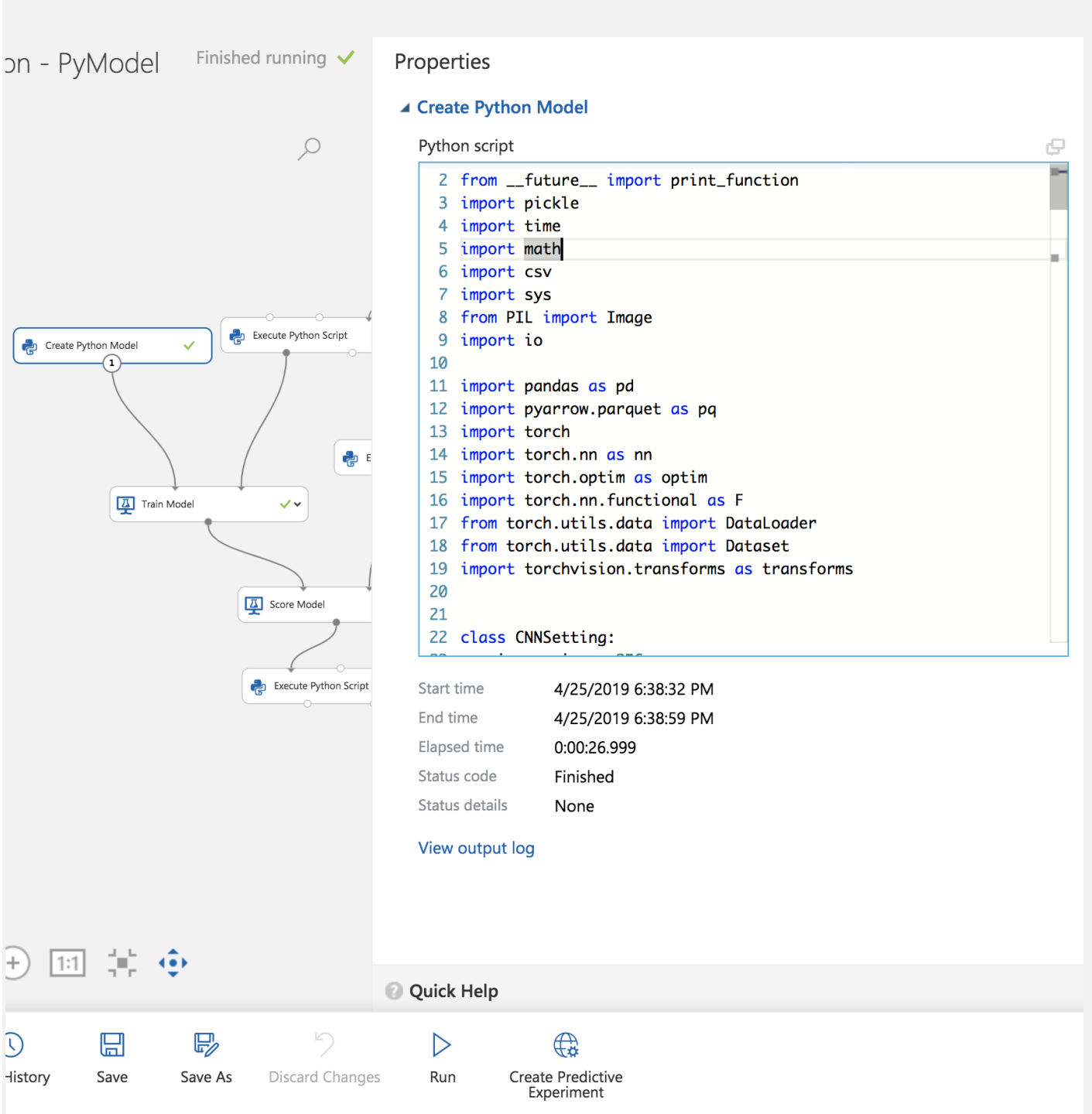
Easy Deployment

- A few clicks
- Automatic generate scoring file
- Model registration
- Build image
- AKS for scale



Custom Code

- Run Python code
- Create Model



Managed Notebook VM

Managed Notebook VM

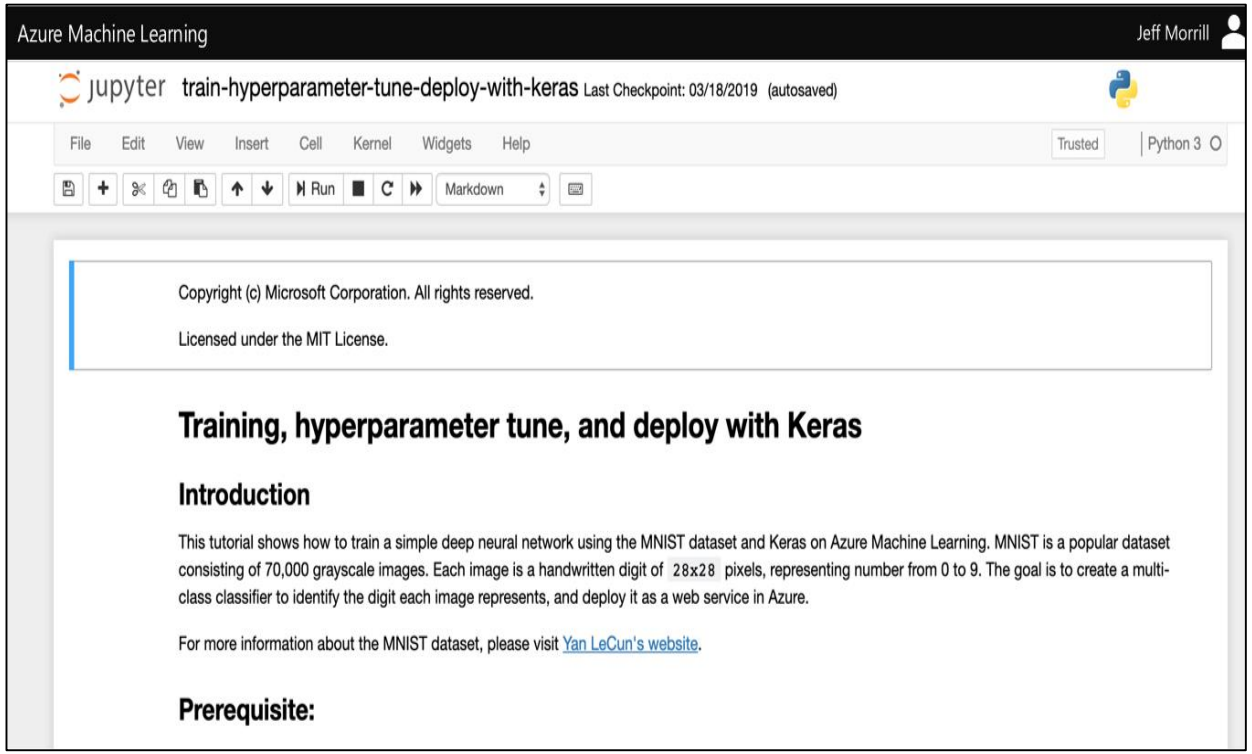
Service/feature description

Azure Machine Learning hosted notebooks provide a code-first experience where users can perform every operation supported by the Azure Machine Learning Python SDK using a familiar Jupyter notebook.

Service/feature value proposition

Hosted notebooks simplify the getting-started process by providing a secure, enterprise-ready environment for ML practitioners. In the private preview customers will be able to: access a notebook integrated into the Azure ML workspace, use preconfigured Azure ML notebooks with no set up required, fully customize their notebook VMs including having the ability to add packages and drivers.

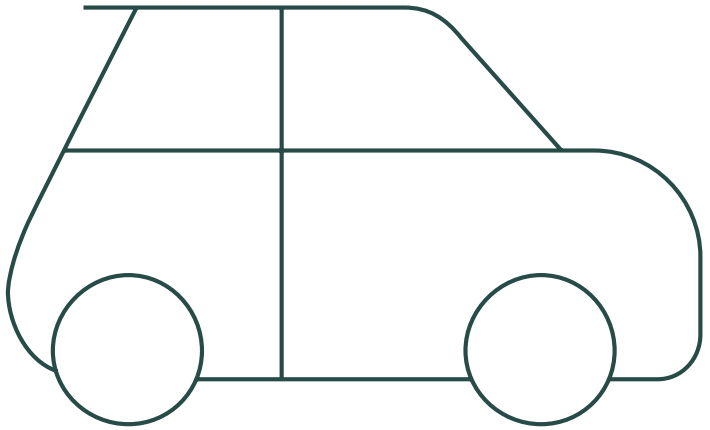
Documentation: Quickstart



Automated Machine Learning
AutoML

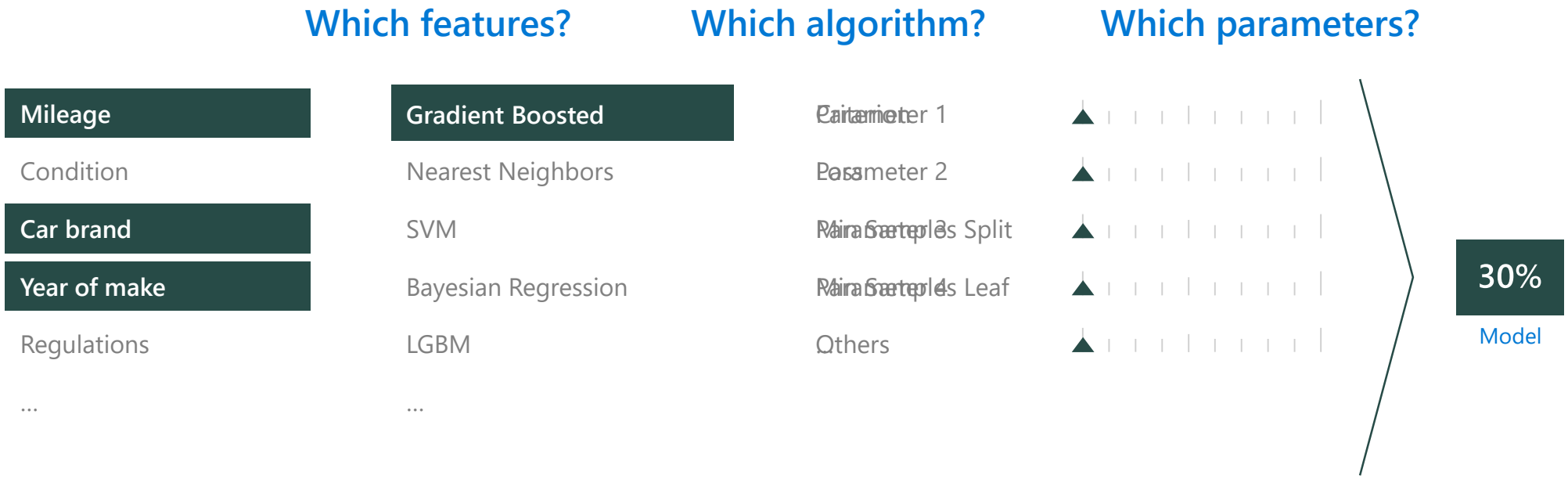
Azure Machine Learning

Automated machine learning



How much is this car worth?

Model creation is typically a time consuming process



Model creation is typically a time consuming process

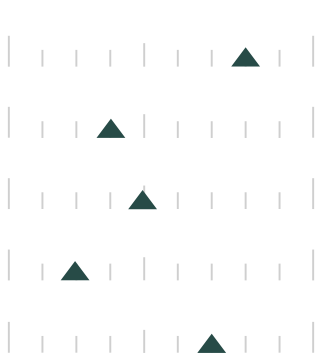
Which features?

- Mileage
- Condition
- Car brand
- Year of make
- Regulations
- ...

Which algorithm?

- Gradient Boosted
- Nearest Neighbors
- SGD
- Bayesian Regression
- LGBM
- ...

Which parameters?



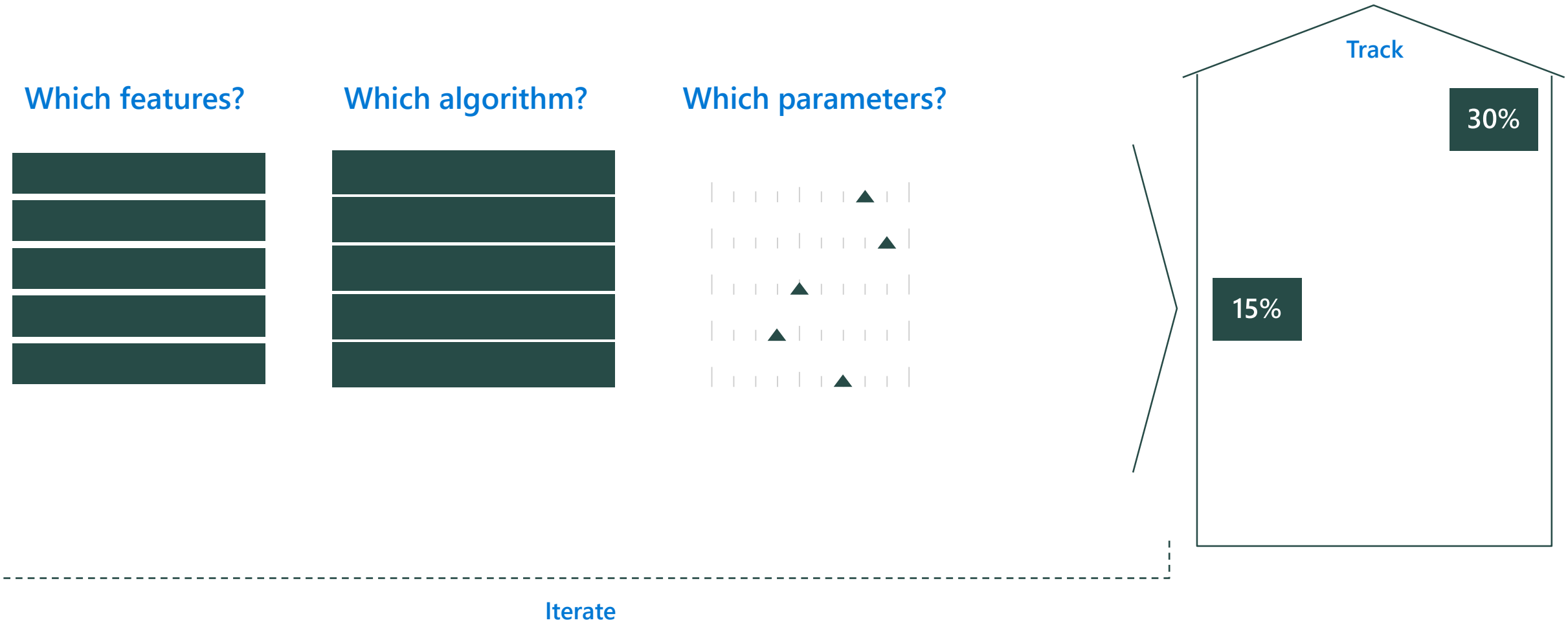
Track

30%

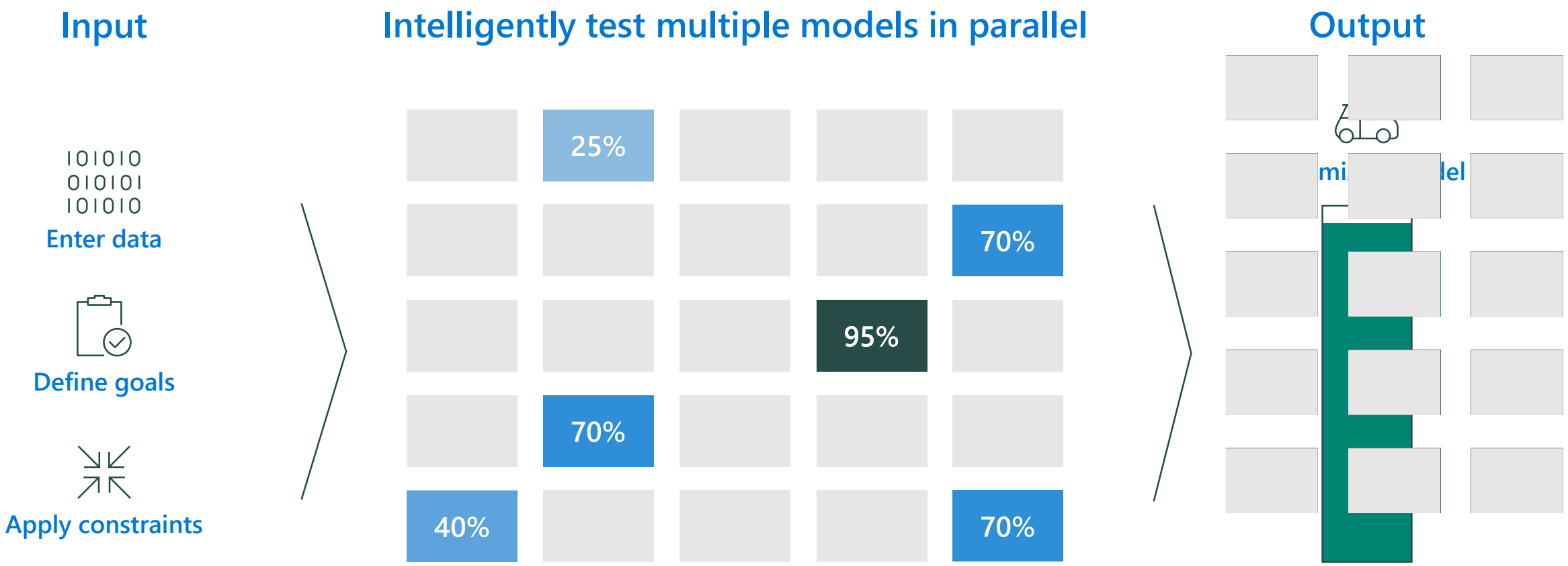
Model

Iterate

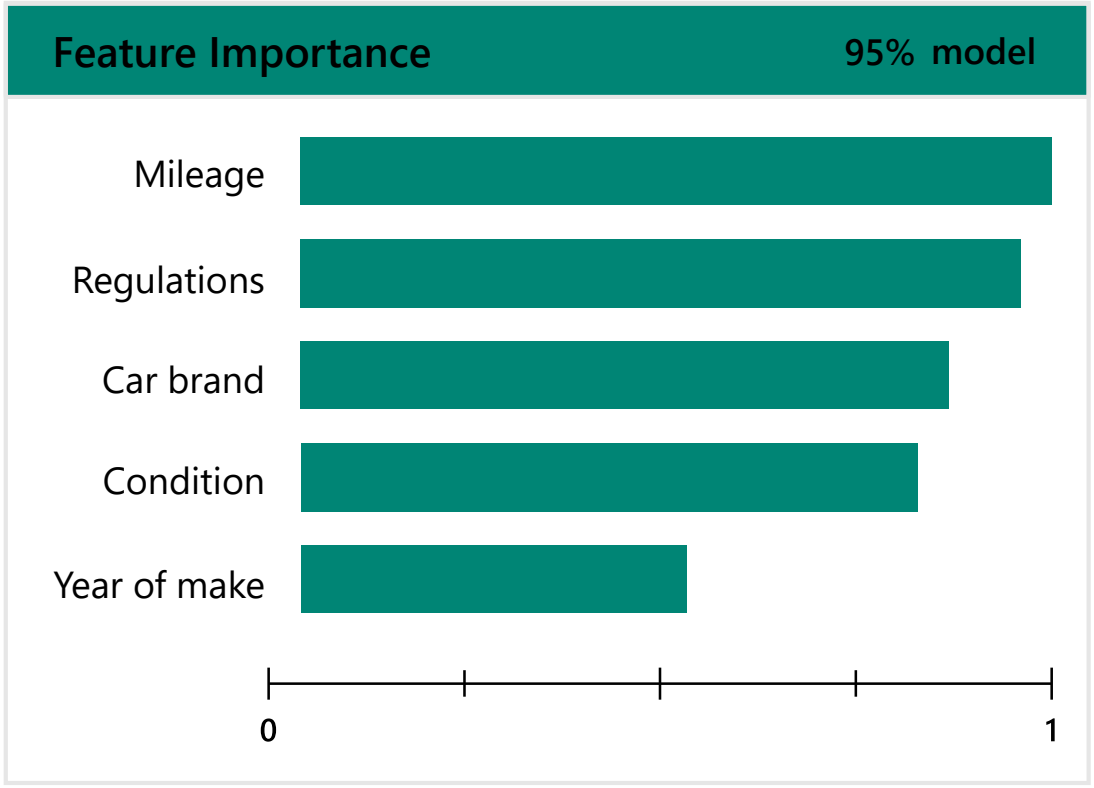
Model creation is typically a time consuming process

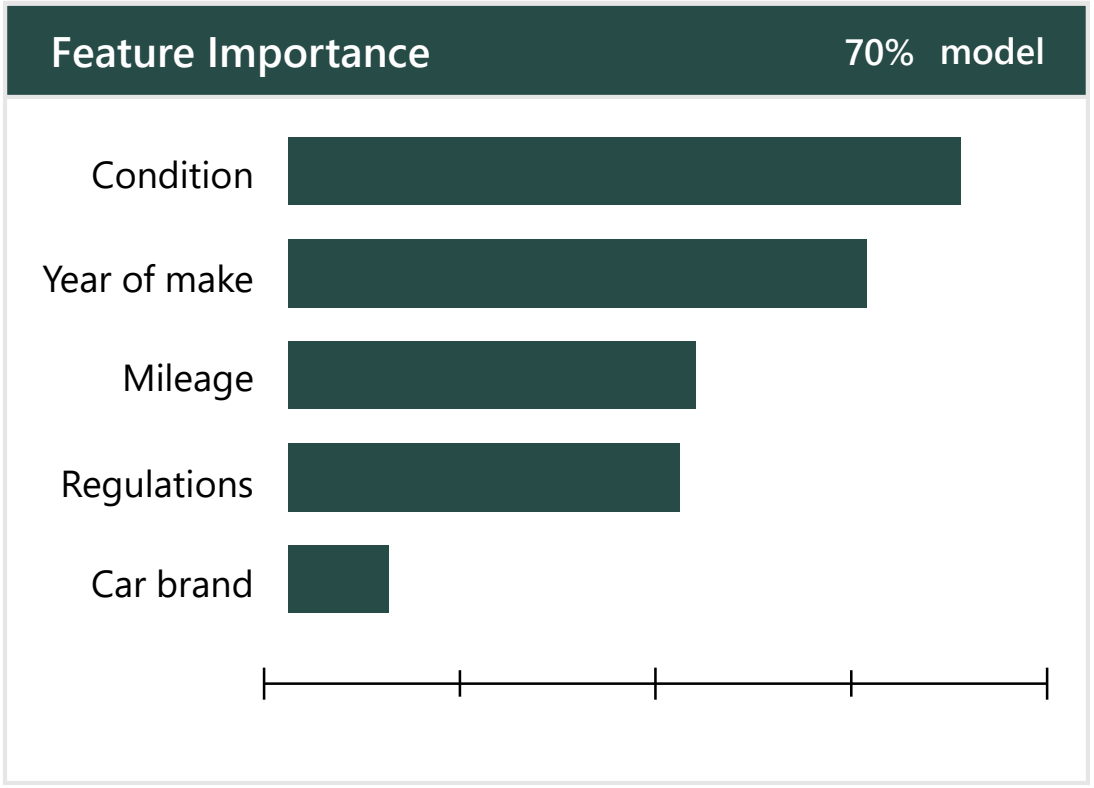


Automated Machine Learning accelerates model development



Understand the inner workings of ML by analyzing feature importance





Enable model explain-ability for every automated ML iteration, not just the optimal model

FPGA hardware accelerated models

Service/feature description

FPGAs are a machine learning inferencing option, based on Project Brainwave, a hardware architecture from Microsoft. Data scientists and developers can use FPGAs to accelerate real-time AI calculations.

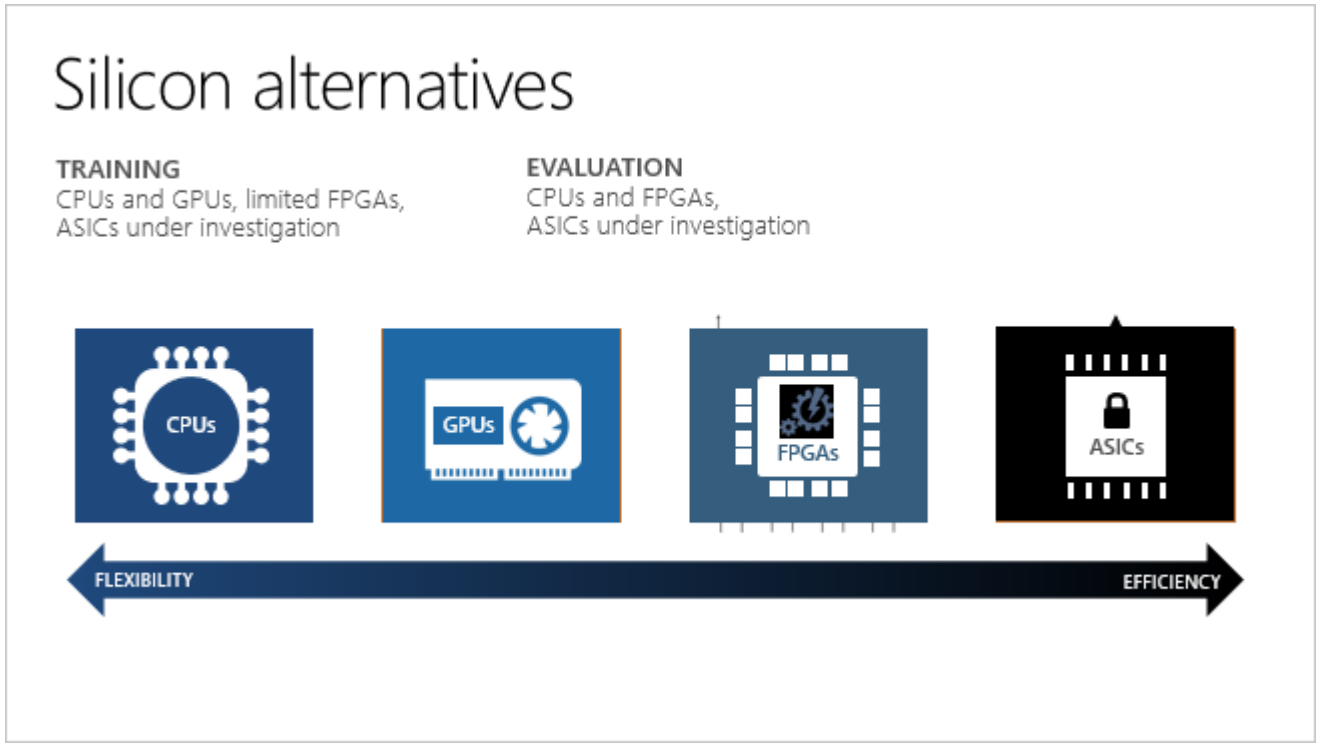
Service/feature value proposition

FPGAs offer performance, flexibility, and scale and are available only through Azure Machine Learning. They make it possible to achieve low latency for real-time inferencing requests, mitigating the need for asynchronous requests (batching).

Other important points or upcoming milestones such as:

FPGAs on Azure Machine Learning are going at build add additional algorithm support.

Documentation: Overview



https://github.com/Azure/MachineLearningNotebooks/tree/master/how-to-use-azureml/deployment/accelerated-models/

MLOps

Service/feature description

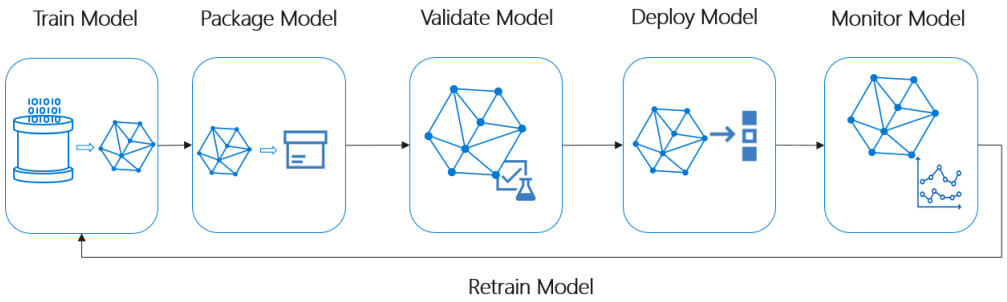
Azure Machine Learning has a mission to simplify the end to end machine learning lifecycle, including data prep, model training, model packaging, validation and model deployment. To enable this, we are launching the following services:

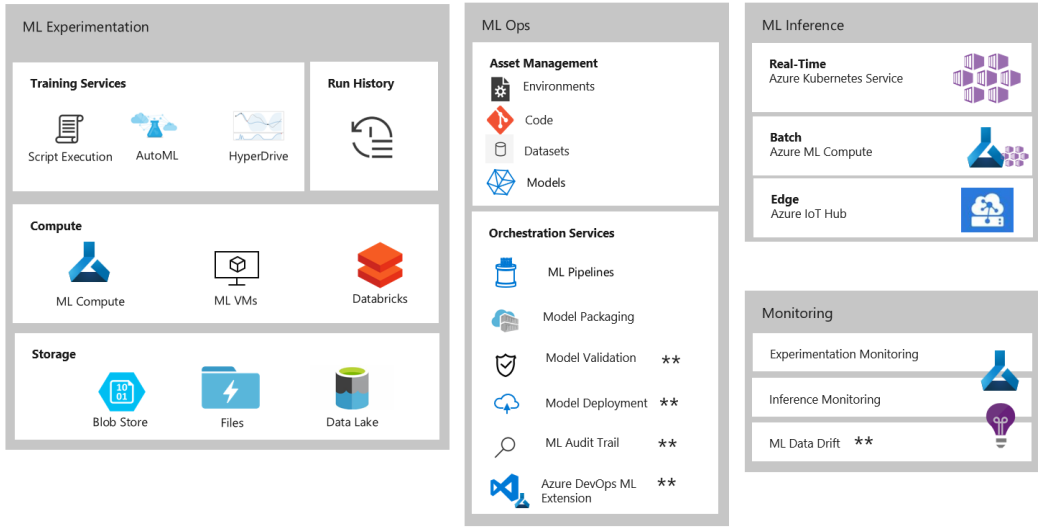
- **Environment, Code & Data versioning** services, integrated into the **Azure ML Audit Trail**
- The **Azure DevOps extension for Machine Learning** & the **Azure ML CLI**
- A simplified experience for **validating** and **deploying** ML models

Value proposition

Microsoft enables you to adopt ML quickly by accelerating your time to a production-ready, cloud-native ML solution. Production readiness is defined as:

- Reproducible model training pipelines
- Provably validate, profile and track model before release
- Enterprise-class rollout and integrated observability including all necessary respecting all appropriate security guidelines





Documentation: [Model Management](#) | [How & where to deploy](#) | [ML CLI](#) | [CI/CD workflow](#)

Model interpretability in the AzureML SDK

Service/feature description

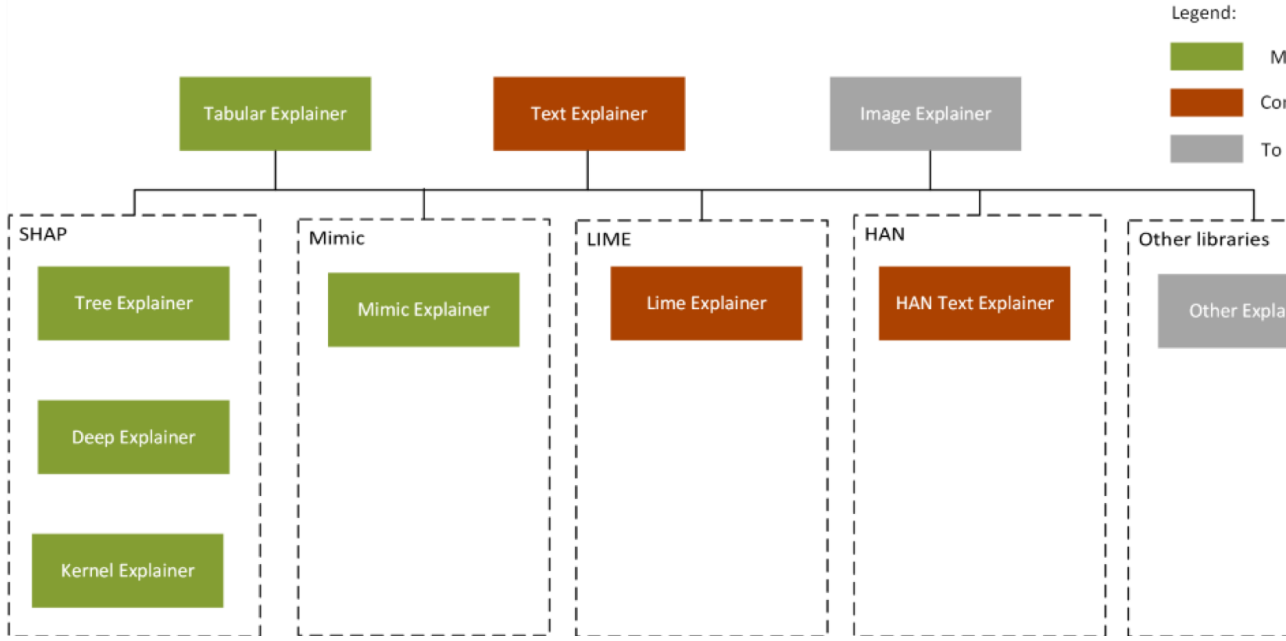
Machine learning interpretability allows data scientists to explain machine learning models globally on all data, or locally on a specific data point using the state-of-art technologies in an easy-to-use and scalable fashion.

Service/feature value proposition

Machine Learning interpretability incorporates technologies developed by Microsoft and proven third-party libraries (for example, SHAP and LIME). The SDK creates a common API across the integrated libraries and integrates Azure Machine Learning services. Using this SDK, you can explain machine learning models globally on all data, or locally on a specific data point using the state-of-art technologies in an easy-to-use and scalable fashion.

Compete comparison/talking points

Documentation: [Overview & examples]

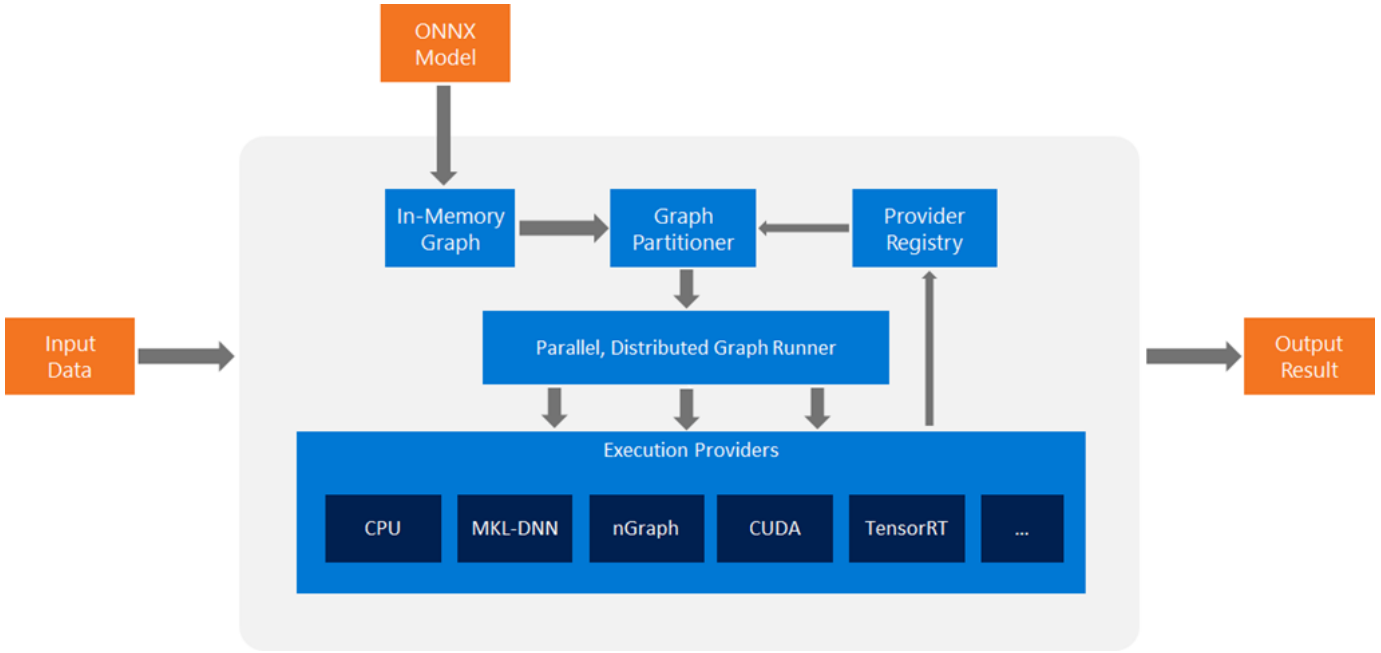


ONNX Runtime

Service/feature description We are excited to announce the GA of ONNX Runtime the NVIDIA TensorRT execution provider in ONNX Runtime, enabling developers to easily leverage industry-leading GPU acceleration regardless of their choice of framework. Developers can accelerate inferencing of ONNX models, which can be exported or converted from PyTorch, TensorFlow, and many other popular frameworks.

Service/feature value proposition

ONNX Runtime together with its TensorRT execution provider accelerates the inferencing of deep learning models on NVIDIA hardware. This enables developers to run ONNX models across different flavors of hardware and build applications with the flexibility to target different hardware configurations. The architecture abstracts out the details of the hardware specific libraries that are essential to optimizing the execution of deep neural networks.



Documentation: How-to

Open Datasets

Service/feature description

Open Datasets are a collection of datasets from the public domain to accelerate the development of machine learning models built in Azure. Open Datasets integrates with Machine Leaning Studio or can be accessed from python notebooks in Azure Machine Learning Service.

Service/feature value proposition

Azure Open Datasets offer good quality data from the public domain, which is often hard to find and expensive to curate. Data scientists will be more productive focusing on model building rather than data preparation.

Other important points or upcoming milestones such as:

- Improved SDK with enhanced AML SDK integration
- Many more datasets – looking for suggestions, please update dataset asks from your customers.

ML.NET

Service/feature description

ML.NET 1.0 release is the first major milestone of a great journey in the open that started in May 2018 when we released ML.NET 0.1 as open source. Since then we've been releasing monthly, 12 preview releases plus this final 1.0 release.

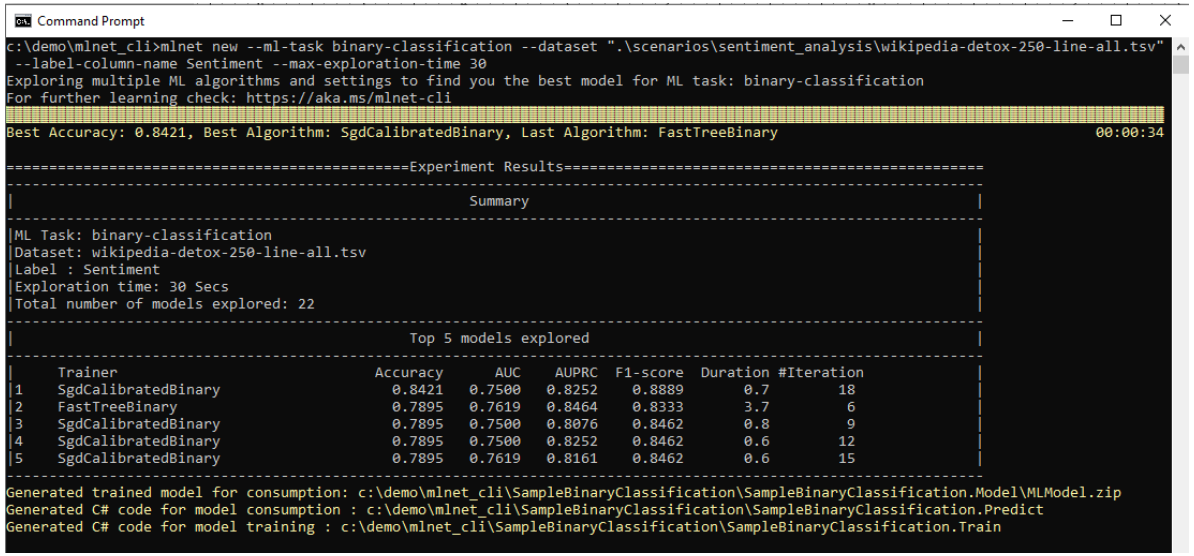
Service/feature value proposition

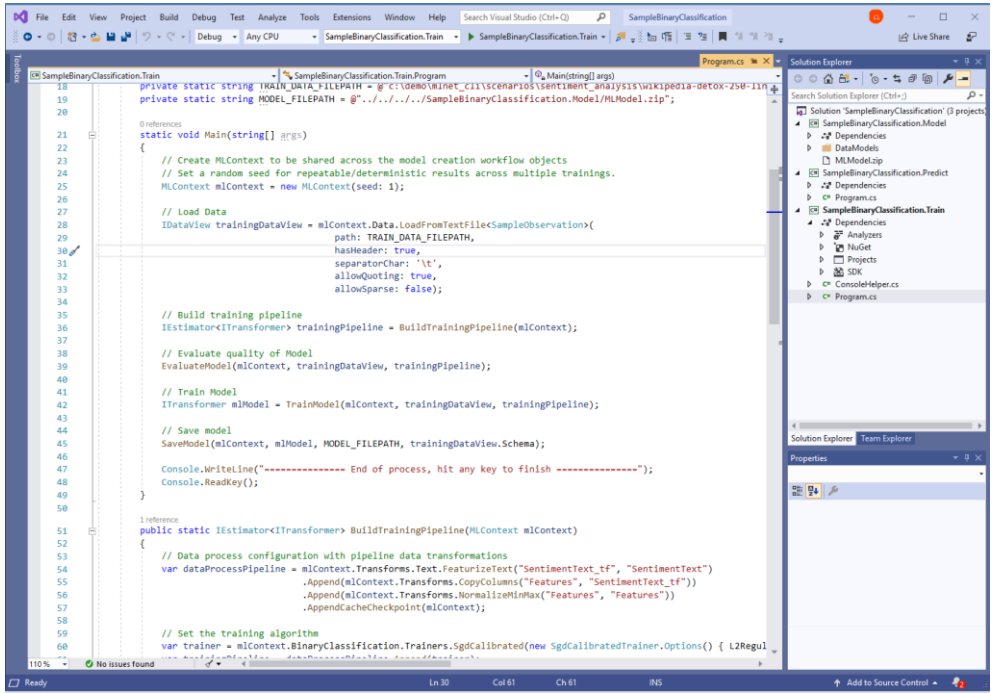
ML.NET is an open-source and cross-platform machine learning framework for .NET developers. Using ML.NET, developers can leverage their existing tools and skillsets to develop and infuse custom AI into their applications by creating custom machine learning models for common scenarios like Sentiment Analysis, Recommendation, Image Classification and more.

You can use NimbusML, the ML.NET Python bindings, to use ML.NET with Azure Machine Learning.

NimbusML enables data scientists to use ML.NET to train models in Azure Machine Learning or anywhere else they use Python. The trained machine learning model can easily be used in a .NET application with the ML.NET PredictionEngine like this example.

Documentation: ML.NET website

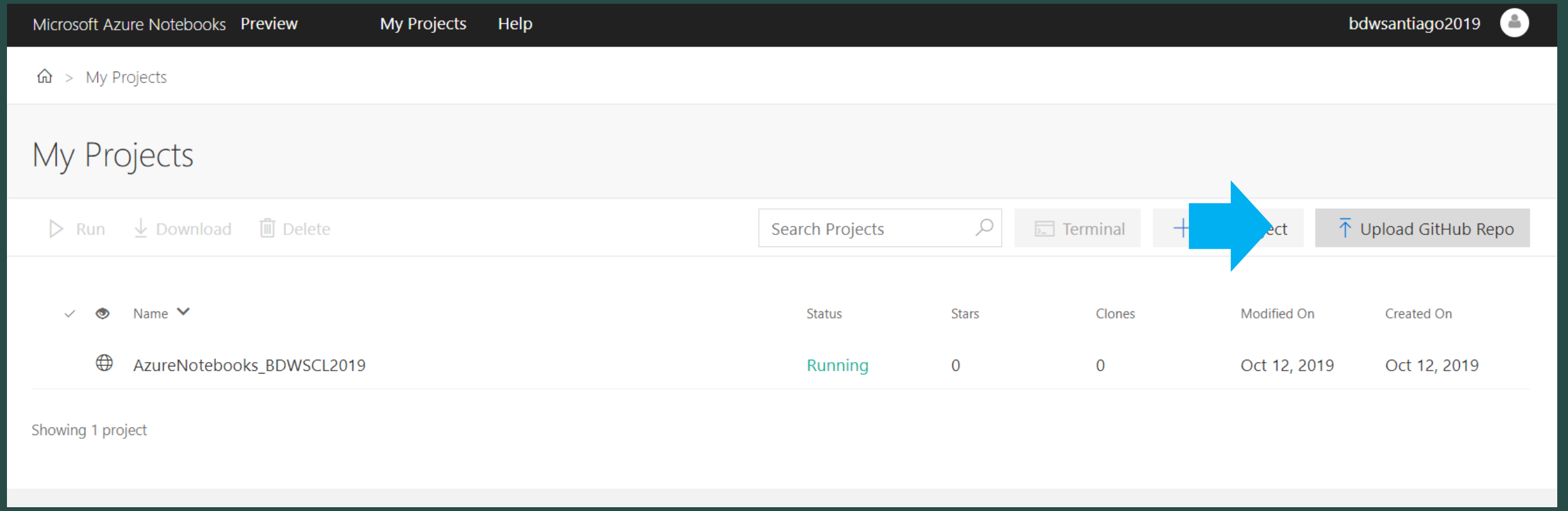




Azure Notebooks
https://notebooks.azure.com

Ejemplos
https://github.com/Azure/MachineLearningNotebooks/

LAB:
https://notebooks.azure.com/bdwsantiago2019/projects/machinelearningnotebooks


Microsoft Azure Notebooks Preview
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Delete
Search Projects
Terminal
Upload GitHub Repo
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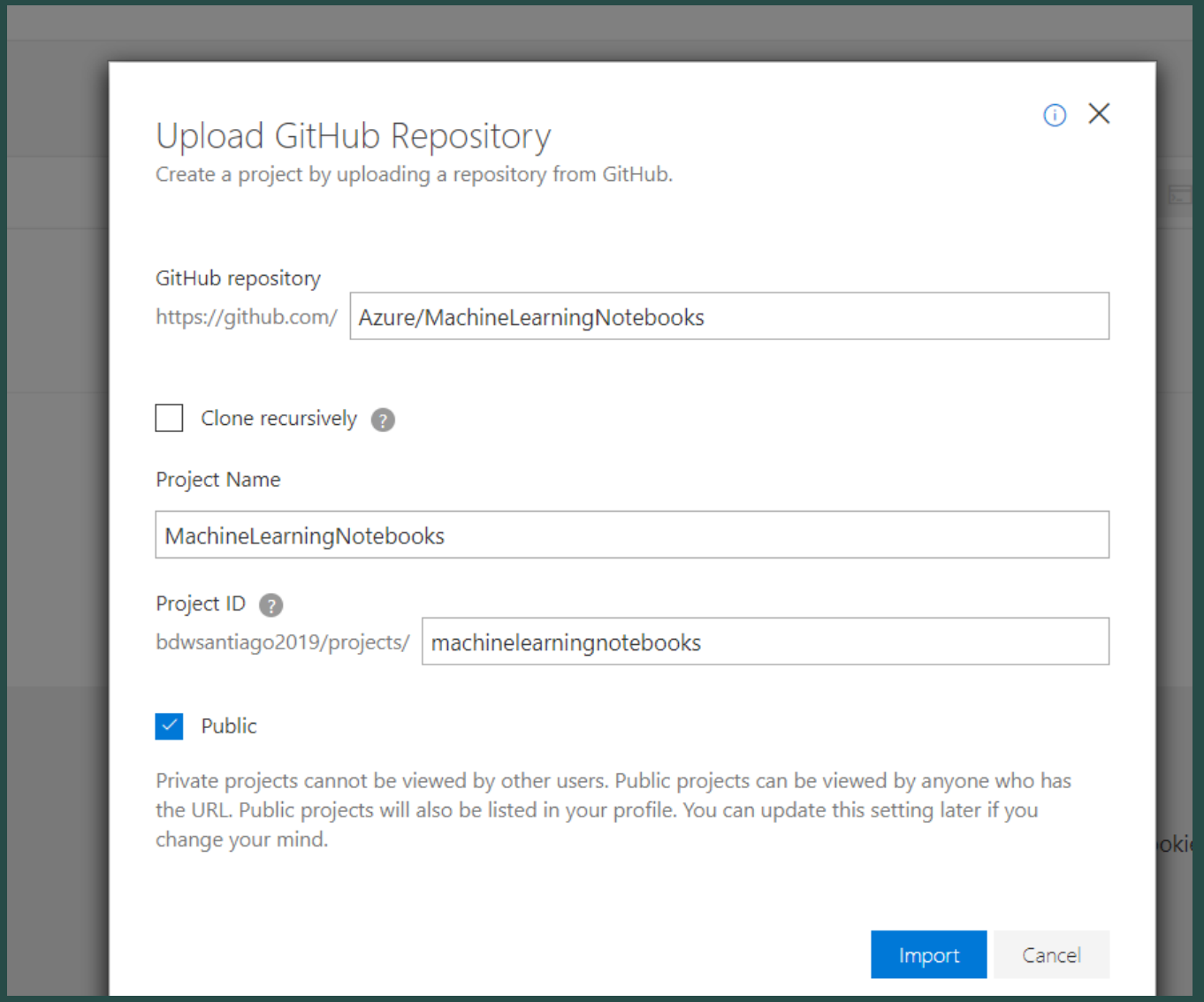
Showing 1 project

https://github.com/Azure/MachineLearningNotebooks



Review

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  - AutoML
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  - Visual Interface
- Labs Jupyter Notebook (local / remote proc)
- Labs Azure Notebooks

Gracias!!!!

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