Bike Rental Prediction Using Azure ML

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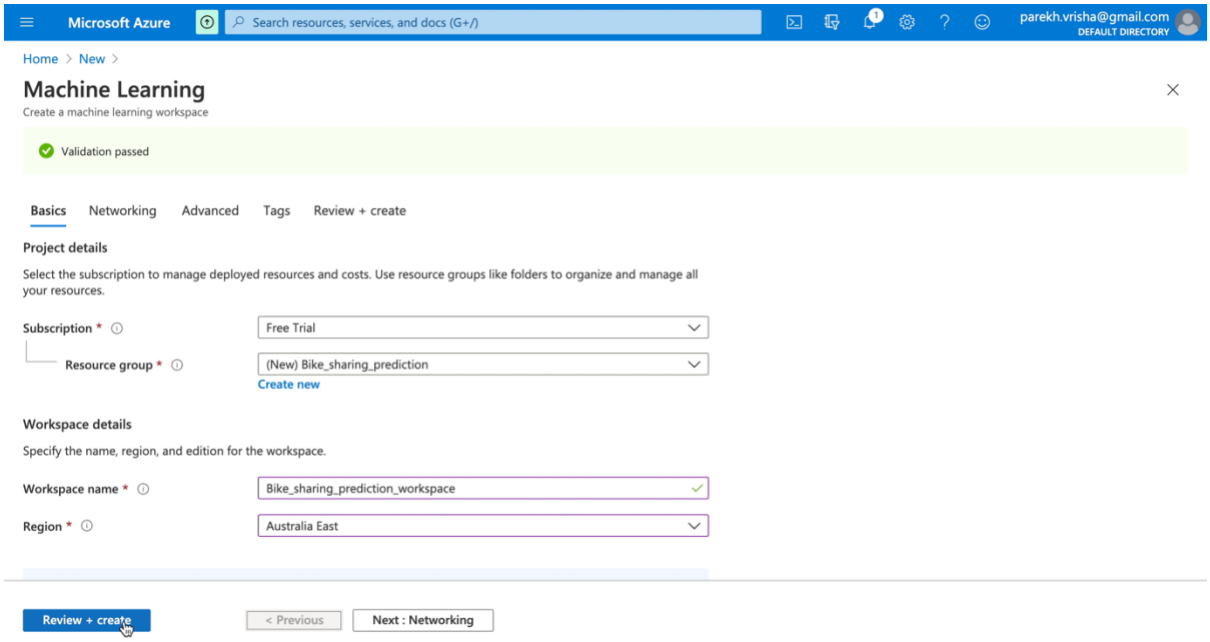
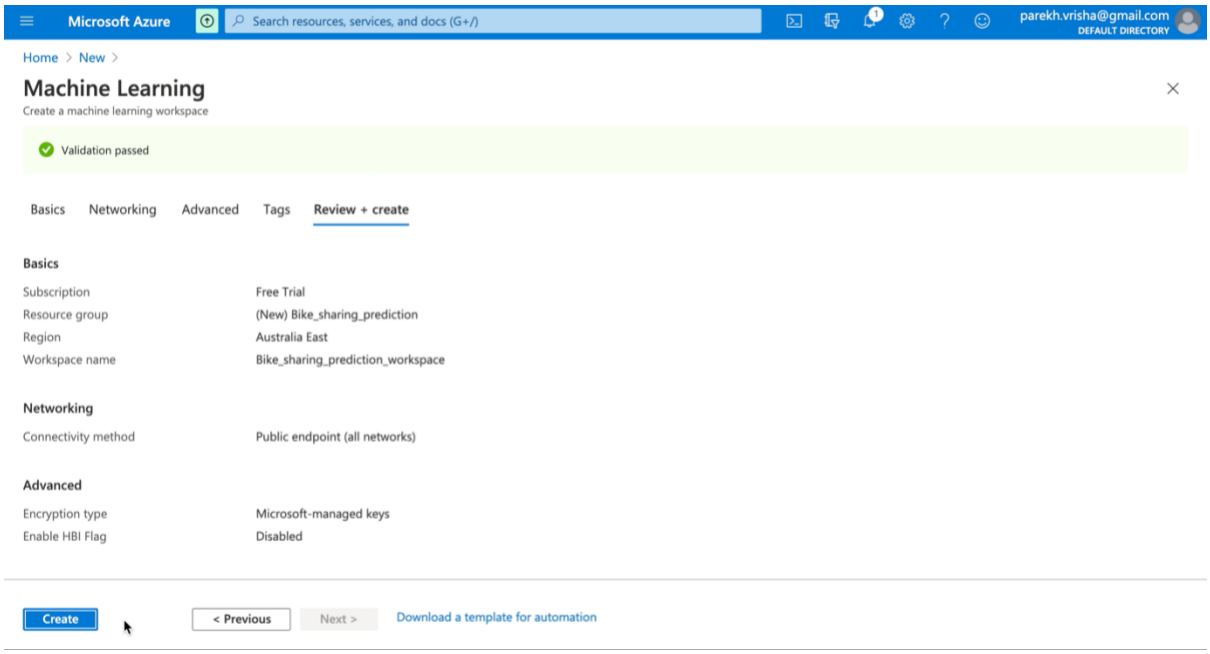
1. Creating an Azure ML workspace

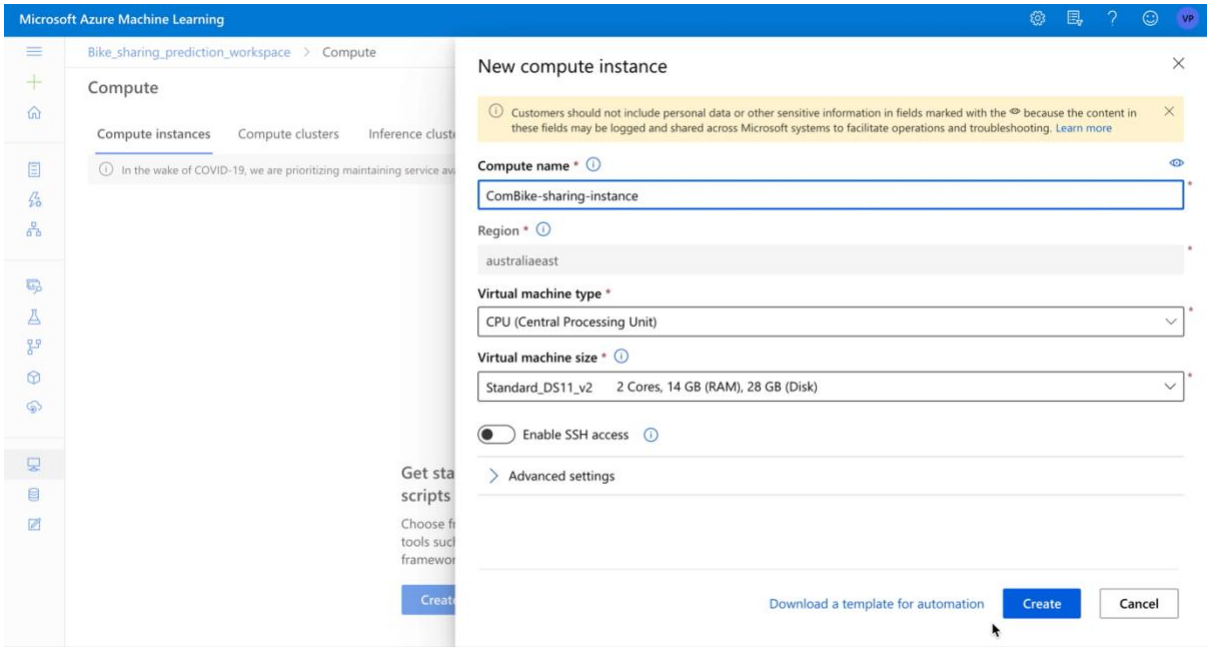
Firstly, a machine learning workspace was created using Azure ML.



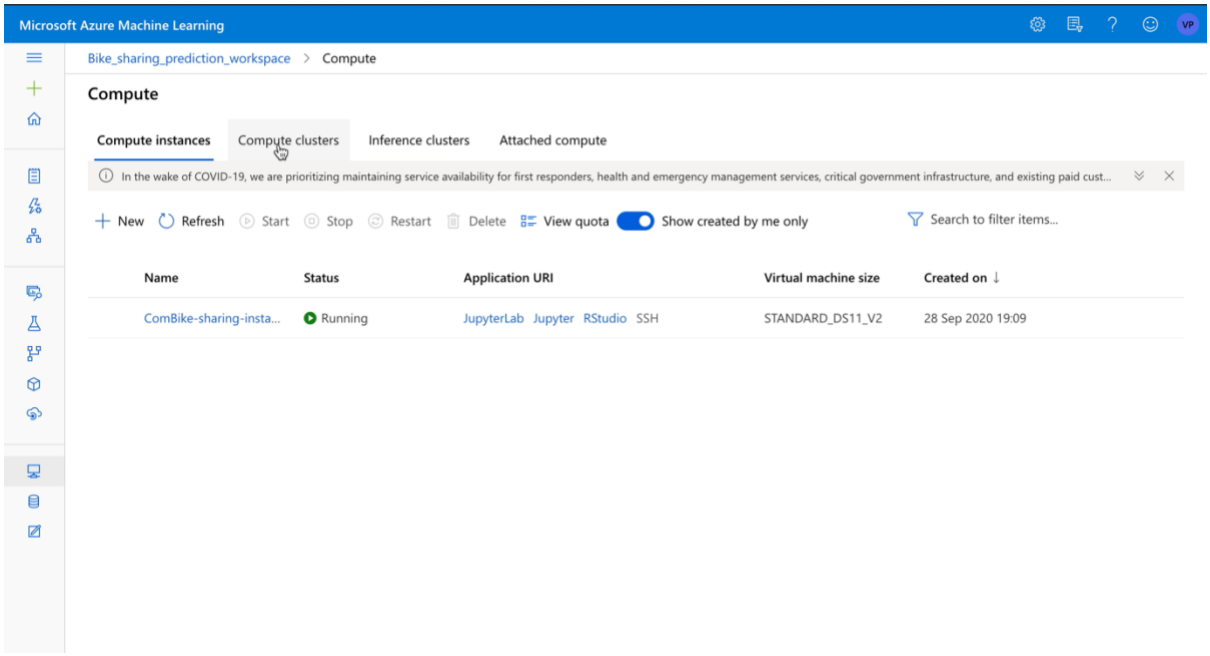


2. Creating Compute instance

Secondly, compute instance was created to use as a workstation on Azure ML Studio.

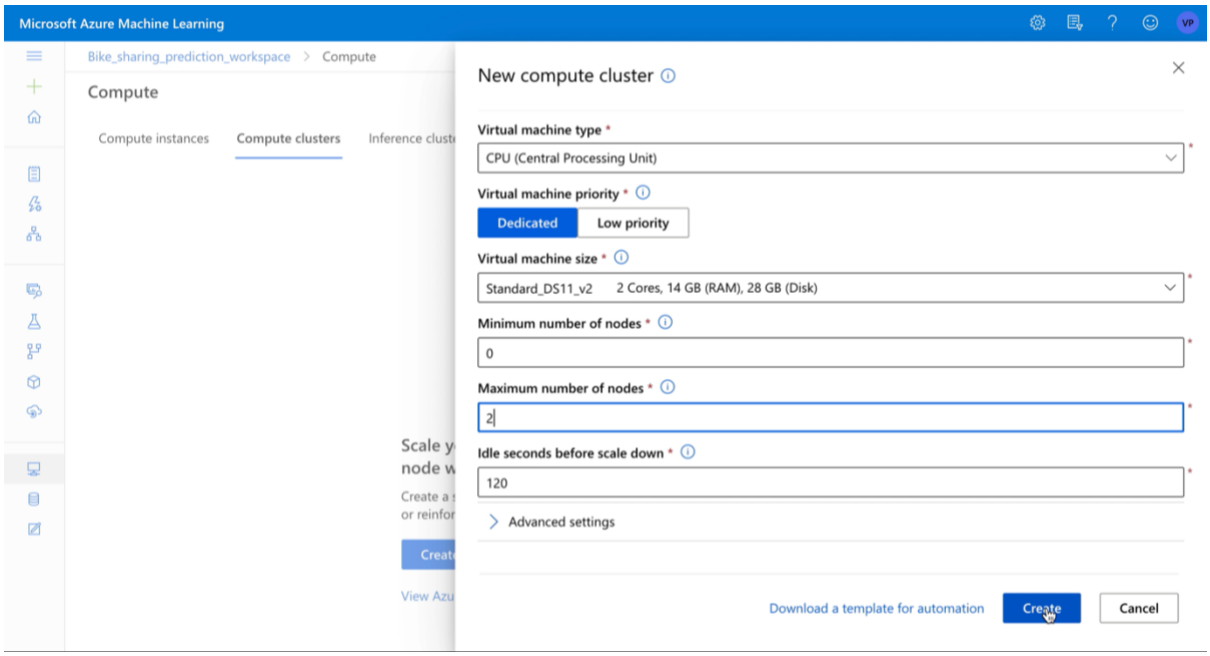


- Compute Instance was created

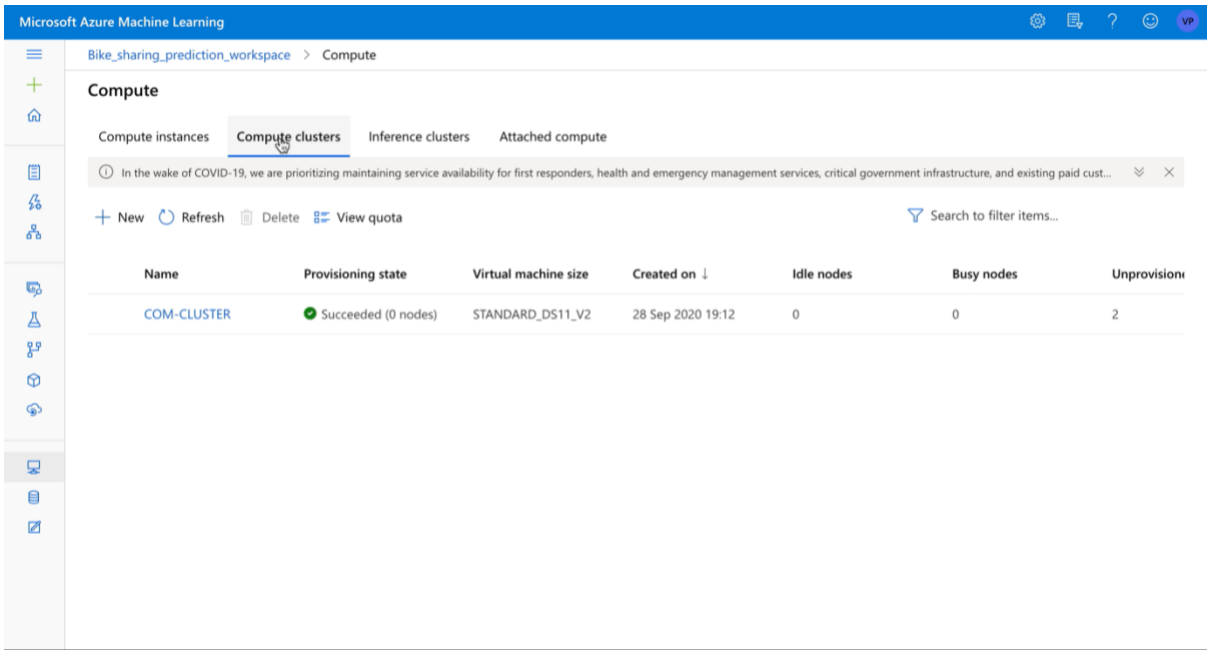


3. Creating Compute cluster

Then a compute cluster was created to process the on-demand code, make the Machine Learning (ML) pipeline and to train the model.

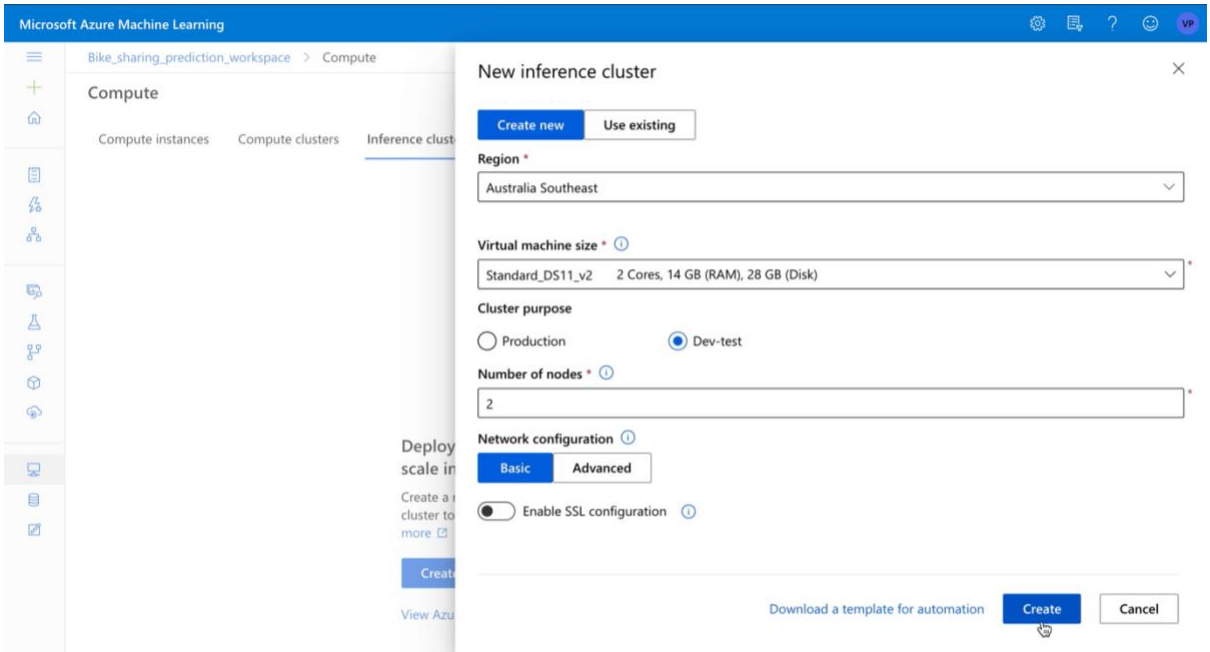


- Compute cluster was created

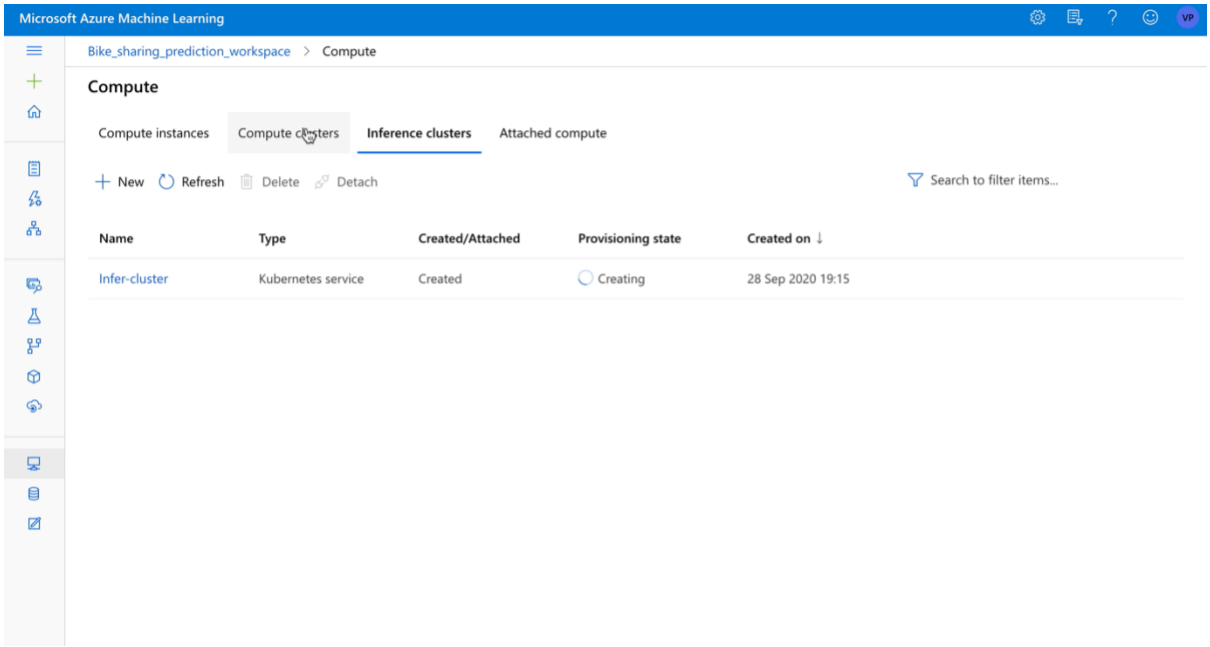


4. Creating Inference cluster

Lastly, an inference cluster was made to deploy the model for it to be used as predictive services.

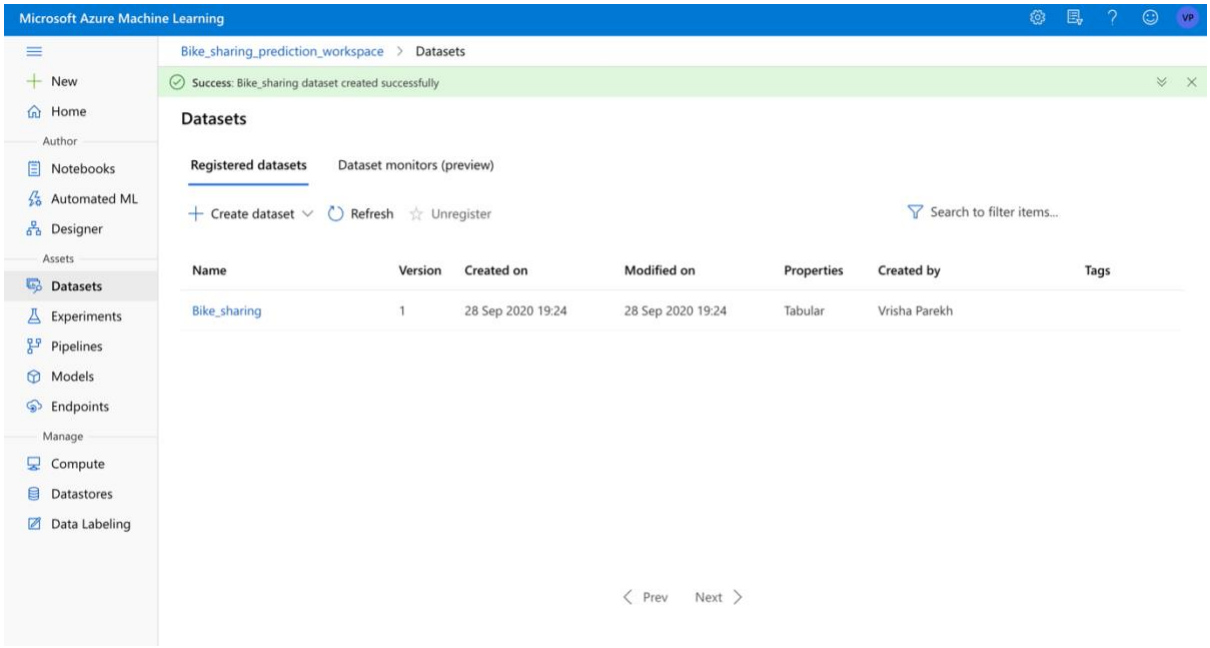


- Inference cluster was created



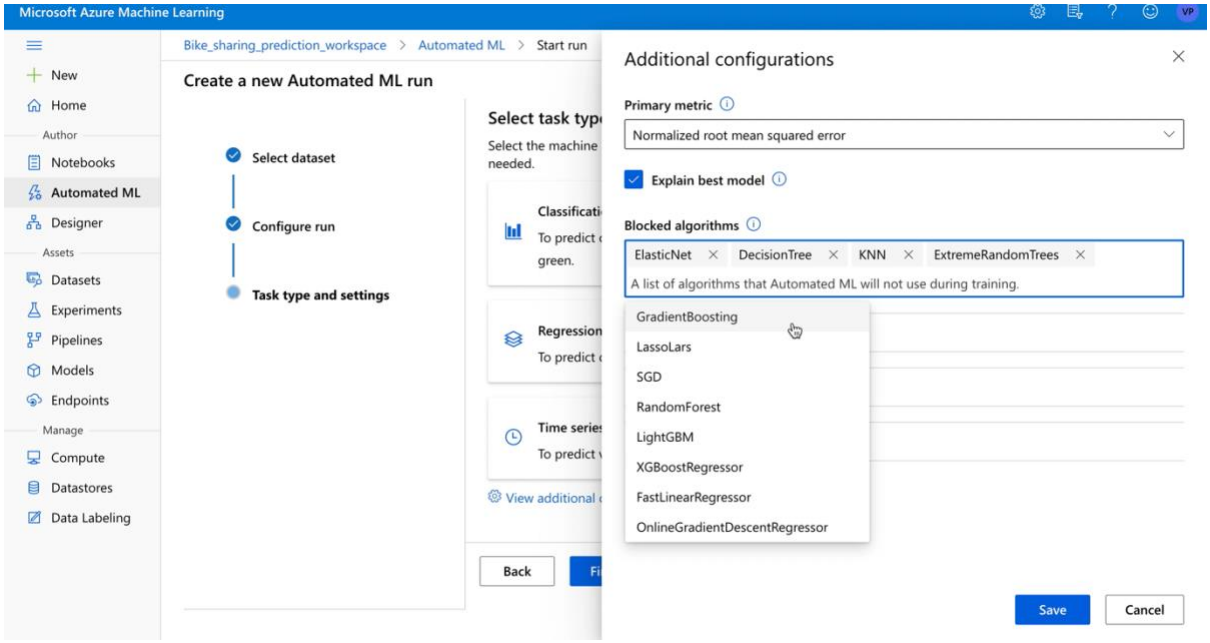
5. Uploading bike data to Azure cloud

Day.csv was uploaded in the dataset section of the Azure ML studio.

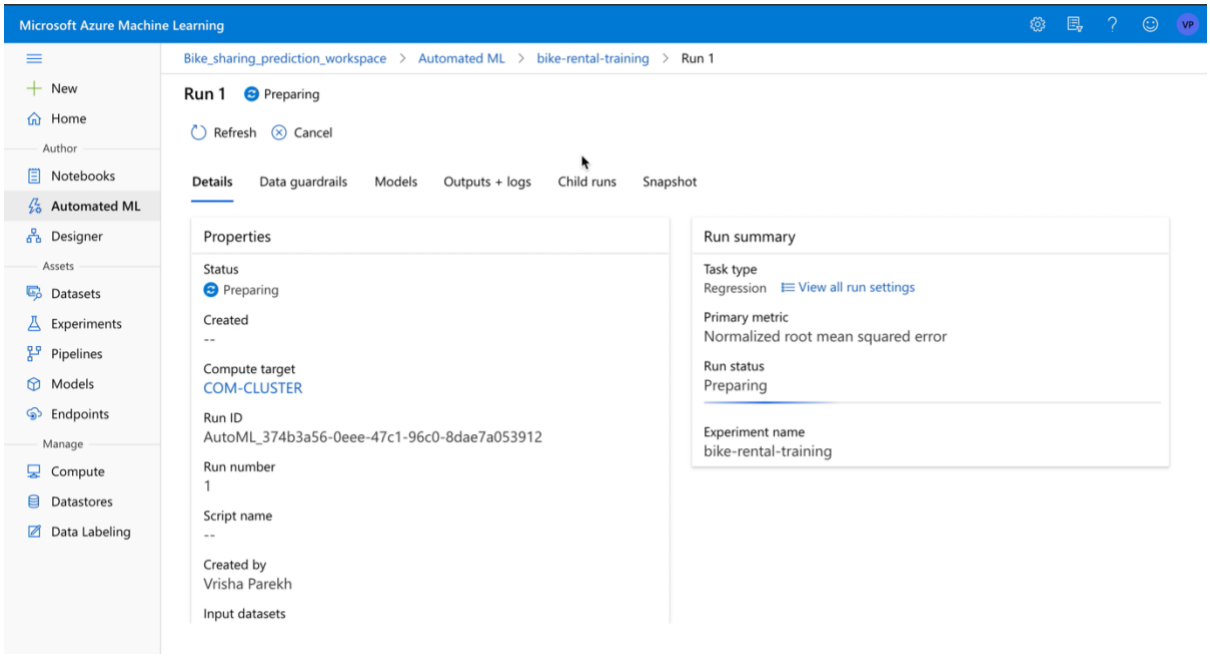


6. Setup and run Auto ML

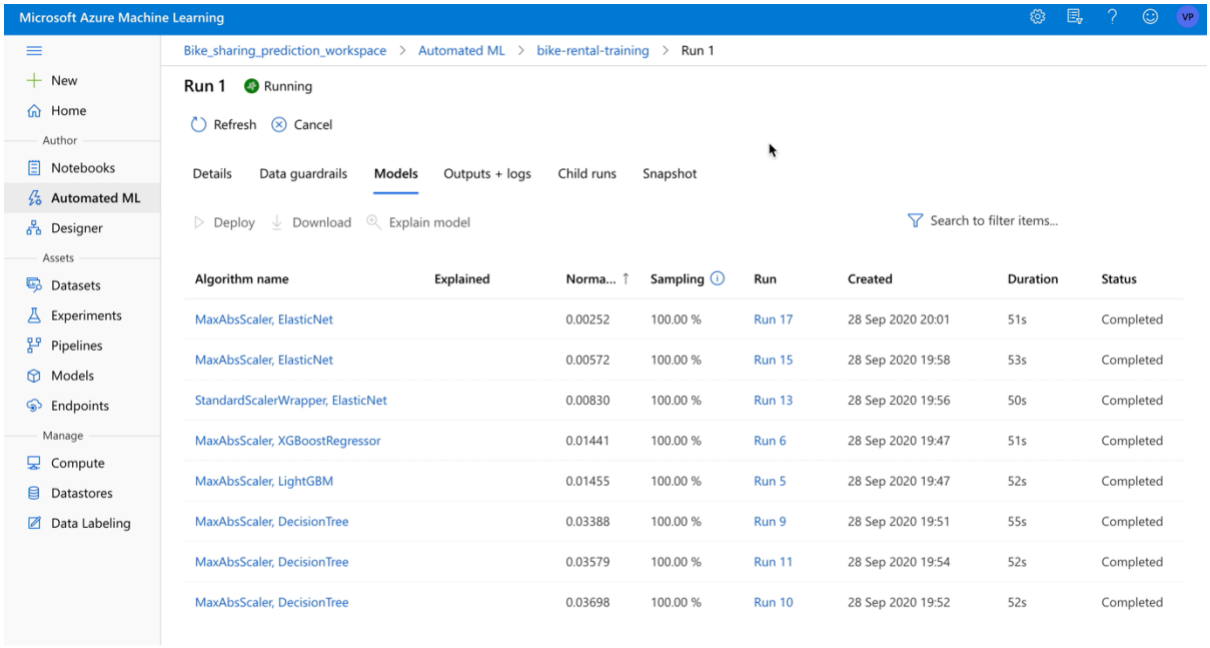
A mix of algorithms were used as a regression test to see which model performs the best.



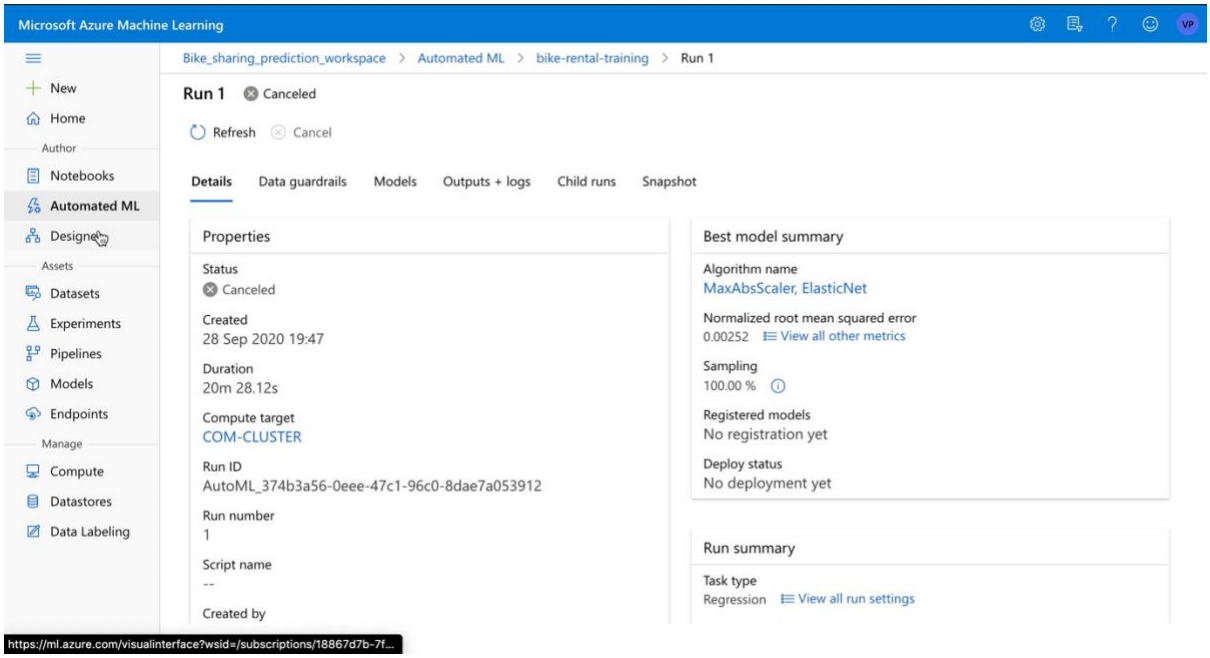
- AutoML initiated



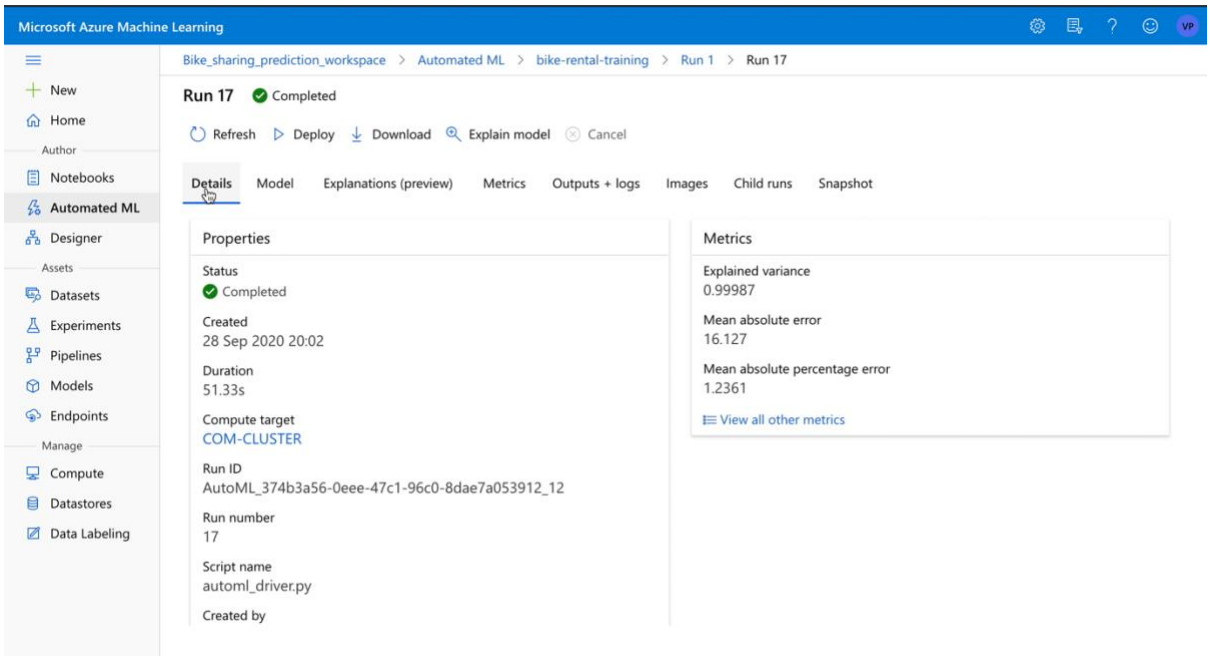
- Different regression models utilised



- Best Model summary



- Metrics of Best model

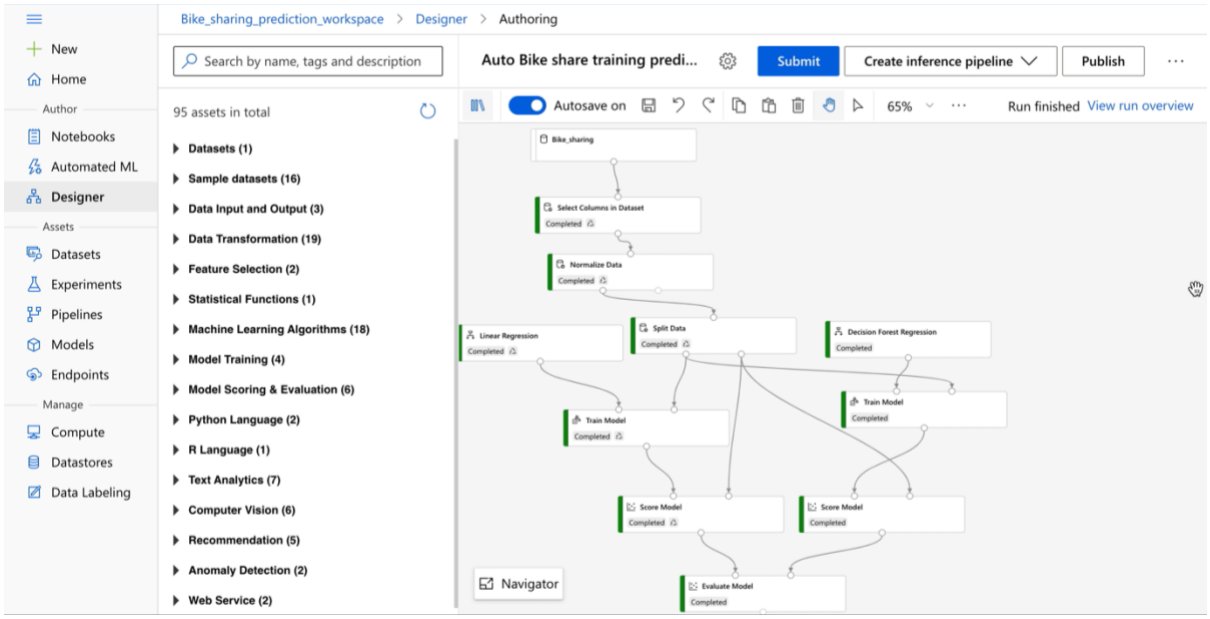


7. Make ML pipeline on Azure Designer

The following steps were performed to build the pipeline below:

- Assign the compute cluster to this pipeline.
- Load the dataset in the designer section and observe the stats and plots of each feature in the visualise option of the data box.
- Drag the 'Select columns in Dataset' box and select all the important features for the model.
- Drag the 'Normalize Data' box to the designer and using the Minmax scaling to scale the numeric features as per the maximum and minimum feature of the columns.
- Use the 'Split Data' module to split the data into train and test sets (Train-70% and test- 30%)
- Use the Linear regression module to train the data.
- Utilise the Train data module which trains the model. Assign the label 'cnt' in this case to this module. This module receives input from the Machine learning model (Linear Regression) and Split Data module.

- Next, use the score module to give the scores of the trained model. This module receives one input from trained model and the other input as test set from the Split data module to predict the scores.
- Lastly, evaluate module is put to use to evaluate the efficiency of the model.

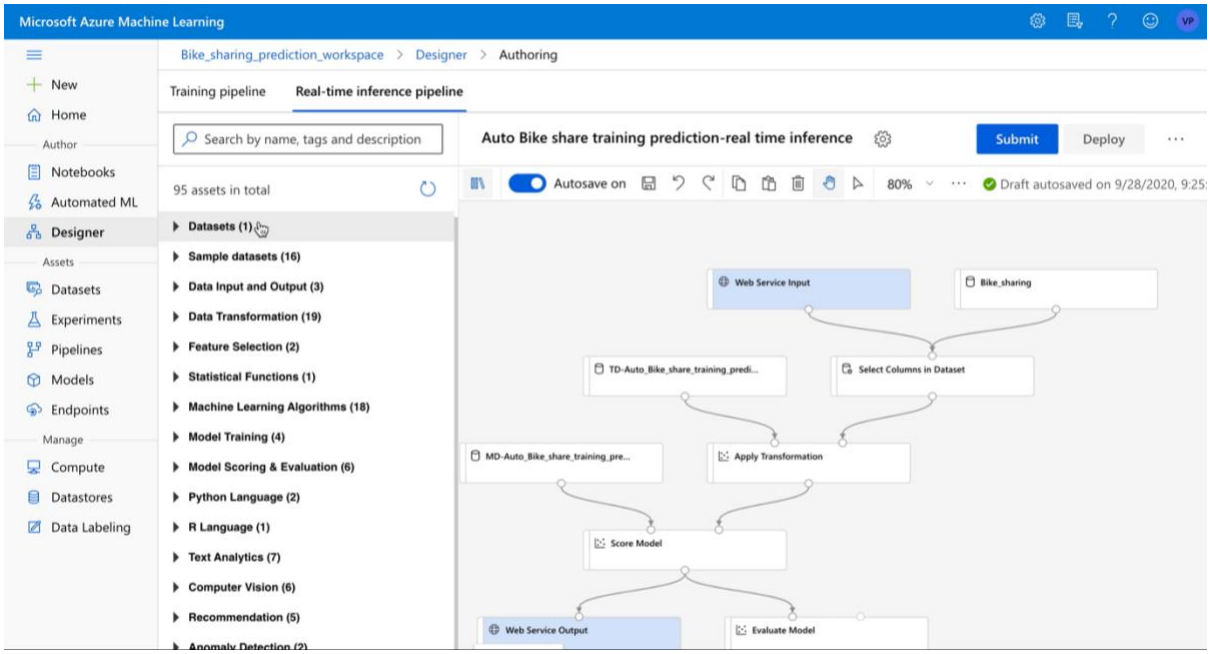


8. Set up model for deployment

As the pipeline was submitted and it ran successfully, this pipeline can now be used for real time predictions. For this, the model was deployed as a web-service. For this, following steps were taken:

- The 'Create inference pipeline' tab was clicked to deploy the model as a web service using the inference cluster.
- Some modifications to the above model were made like removing one model. Secondly, the transformations like splitting data and training model were all part of the 'Apply Transformation' module.Moreover, removing the output variable from the 'Select columns in Dataset' module as that is something which the model will predict in real time.

Now this model, just needs to be connected to the client side for real-time predictions


Microsoft Azure Machine Learning
Bike_sharing_prediction_workspace > Designer > Authoring
New
Home
Author
Notebooks
Automated ML
Designer
Assets
Datasets
Experiments
Pipelines
Models
Endpoints
Manage
Compute
Datastores
Data Labeling
Training pipeline
Real-time inference pipeline
Search by name, tags and description
Auto Bike share training prediction-real time inference
Submit
Deploy
95 assets in total
Autosave on
80%
Draft autosaved on 9/28/2020, 9:25
Datasets (1)
Sample datasets (16)
Data Input and Output (3)
Data Transformation (19)
Feature Selection (2)
Statistical Functions (1)
Machine Learning Algorithms (18)
Model Training (4)
Model Scoring & Evaluation (6)
Python Language (2)
R Language (1)
Text Analytics (7)
Computer Vision (6)
Recommendation (5)
Anomaly Detection (2)
Web Service Input
Bike_sharing
TD-Auto_Bike_share_training_predi...
Select Columns in Dataset
MD-Auto_Bike_share_training_pre...
Apply Transformation
Score Model
Web Service Output
Evaluate Model