Azure Automated ML Demo

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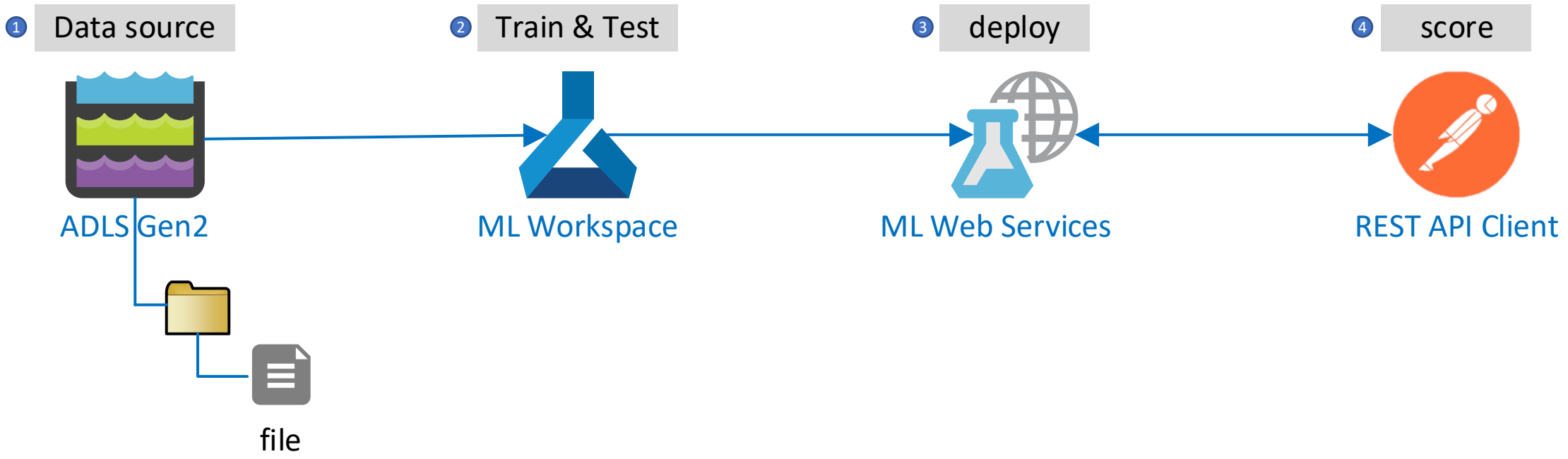
Mar 2020



Overview

What is Azure Automated ML?

Azure Automated Machine Learning (AutoML) focuses on making the entire process of machine learning easy, with the goal of bringing efficiency to data scientists as well as enabling non-data scientists to build models

Aircraft Engine Remaining Useful Life (RUL) Dataset

Dataset Description: Simulated aircraft sensor values to predict when an aircraft engine will fail in the future so that maintenance can be planned, in advance.

Binary classification: Predict if an asset will fail within certain timeframe (e.g., 30 days)

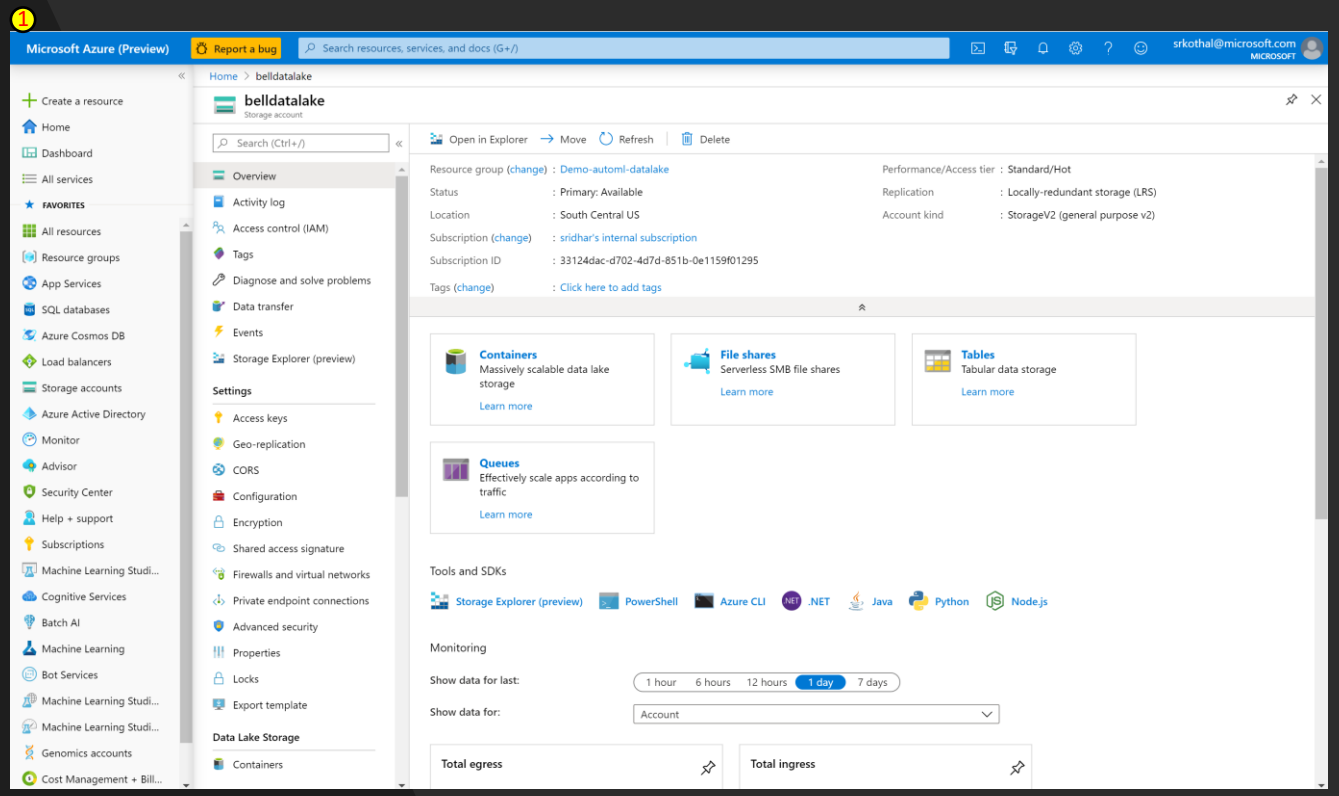
Sample Dataset

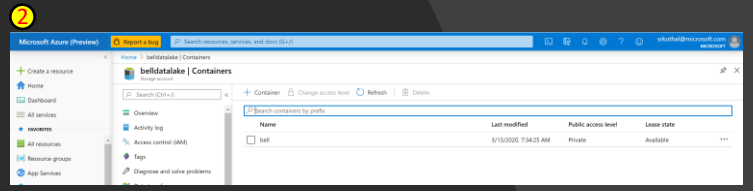
id	cycle	setting1	setting2	setting3	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	s11	s12	s13	s14	s15	s16	s17	s18	s19	s20	s21	label1
1	1	0.0023	3.00E-04	100	518.67	643.02	1585.29	1398.21	14.62	21.61	553.9	2388.04	9050.17	1.3	47.2	521.72	2388.03	8125.55	8.4052	0.03	392	2388	100	38.86	23.3735	1
1	2	-0.0027	-3.00E-04	100	518.67	641.71	1588.45	1395.42	14.62	21.61	554.85	2388.01	9054.42	1.3	47.5	522.16	2388.06	8139.62	8.3803	0.03	393	2388	100	39.02	23.3916	1
2	1	-9.00E-04	4.00E-04	100	518.67	642.66	1589.3	1407.16	14.62	21.61	553.14	2388.1	9040.2	1.3	47.43	521.62	2388.14	8129.59	8.4283	0.03	392	2388	100	39	23.3923	0
2	2	-0.0011	2.00E-04	100	518.67	642.51	1588.43	1405.47	14.62	21.61	553.53	2388.07	9053.77	1.3	47.45	522.02	2388.08	8120.05	8.4414	0.03	393	2388	100	38.84	23.2902	0
3	95	0.0014	-2.00E-04	100	518.67	642.95	1595.37	1408.57	14.62	21.61	553.01	2388.1	9049.88	1.3	47.61	521	2388.16	8129.84	8.4695	0.03	393	2388	100	38.78	23.1833	0
3	96	-0.0017	-4.00E-04	100	518.67	642.83	1588.76	1406.08	14.62	21.61	552.93	2388.15	9053.68	1.3	47.63	521.34	2388.18	8131.72	8.4491	0.03	394	2388	100	38.77	23.3385	1
4	75	-7.00E-04	5.00E-04	100	518.67	642.85	1587.13	1413.85	14.62	21.61	553.16	2388.07	9054.07	1.3	47.65	521.48	2388.07	8129.5	8.4774	0.03	393	2388	100	38.78	23.2761	0
4	76	-0.0047	-4.00E-04	100	518.67	643.11	1583.44	1408.32	14.62	21.61	552.68	2388.13	9052.06	1.3	47.7	521.49	2388.15	8136.24	8.4456	0.03	393	2388	100	38.92	23.2351	1
5	67	-0.0048	1.00E-04	100	518.67	642.58	1586.59	1410.29	14.62	21.61	553.2	2388.1	9058.17	1.3	47.53	521.75	2388.06	8128.16	8.4509	0.03	394	2388	100	38.89	23.2904	0
5	68	-0.0017	-2.00E-04	100	518.67	642.9	1583.33	1413.17	14.62	21.61	553.86	2388.13	9053.78	1.3	47.6	521.08	2388.11	8131.52	8.432	0.03	394	2388	100	38.89	23.26	1
…																										
100	167	0.0011	1.00E-04	100	518.67	642.66	1590.79	1412.69	14.62	21.61	553.57	2388.04	9108.28	1.3	47.59	521.52	2388.05	8172.7	8.4855	0.03	395	2388	100	38.93	23.3488	0
100	168	-0.001	1.00E-04	100	518.67	642.94	1585.16	1406.95	14.62	21.61	553.81	2388.04	9099.31	1.3	47.47	521.65	2388.07	8181.49	8.452	0.03	393	2388	100	38.97	23.3224	1

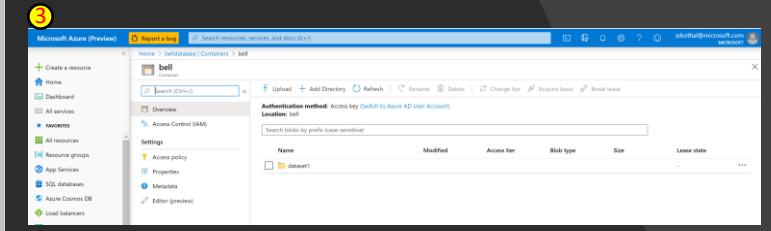
Mapping to Bell sampleProcessData.xlsx

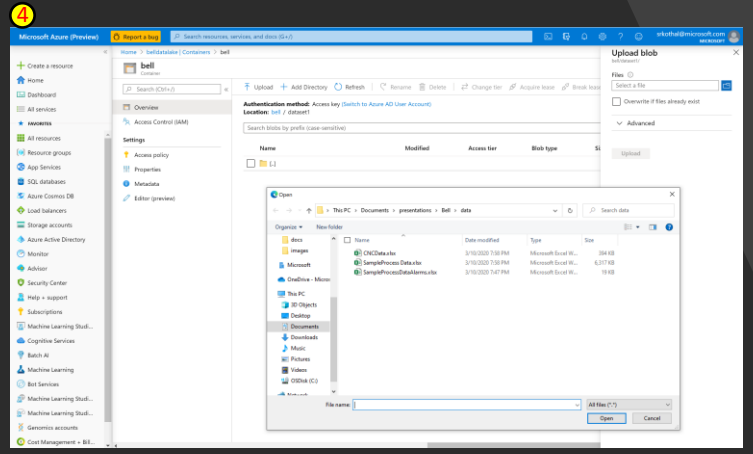
Column Name	Description	Bell sampleprocessdata.xlsx (guessing the mapping)
Id	Aircraft engine identifier, range [1,100]	Machine Id
Cycle	Time, in cycles	Date, Timestamp, Load Code
Setting 1, 2, 3	Operational settings (settings1 – settings3)	Setpoint e.g., “Nitrogen Setpoint”
s1 – s21	Sensor measurement (s1 – s21)	Present Value e.g., “Nitrogen PV”
label1	Ground truth - maintenance required in 30 days (1)	<not available>

Create an ADLS-Gen2 resource and initialize it









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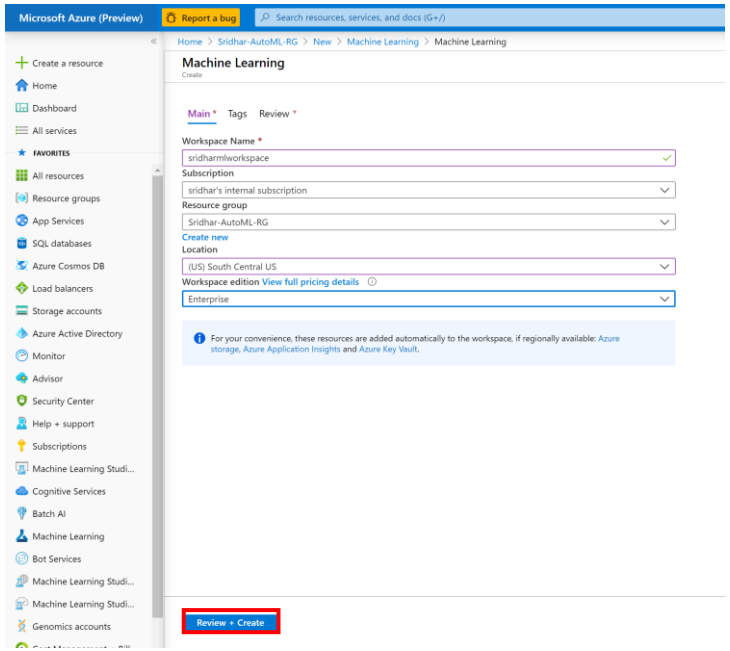

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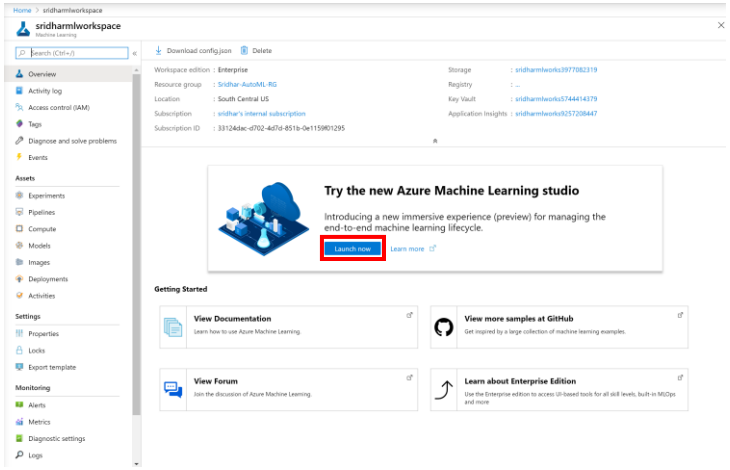

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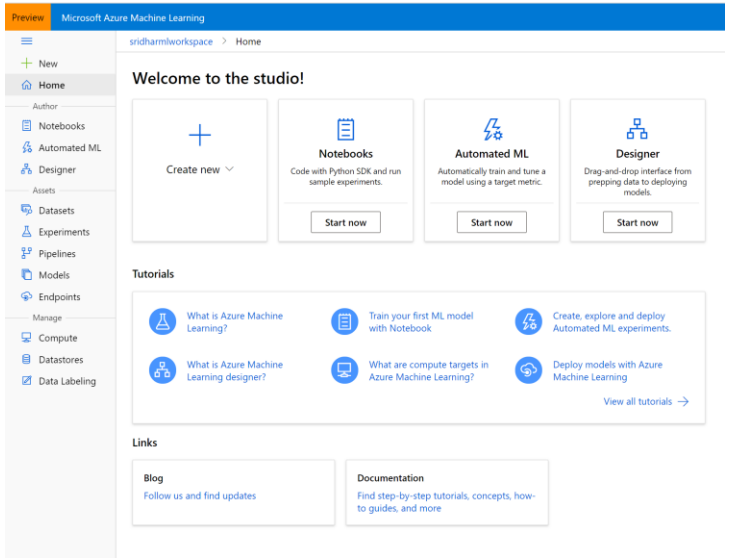
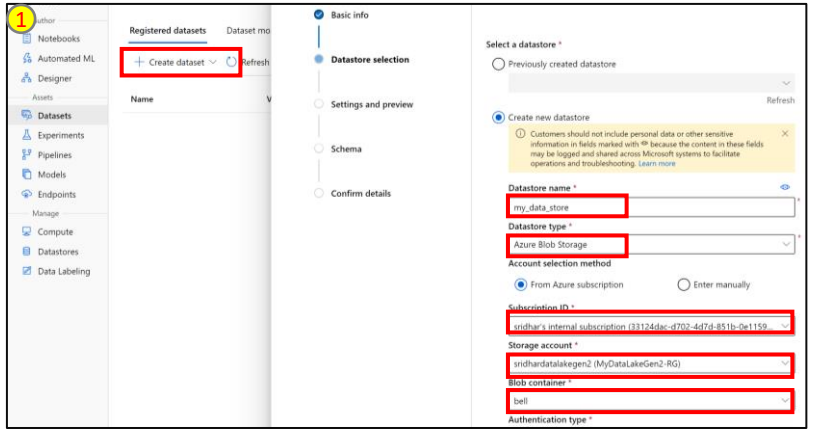
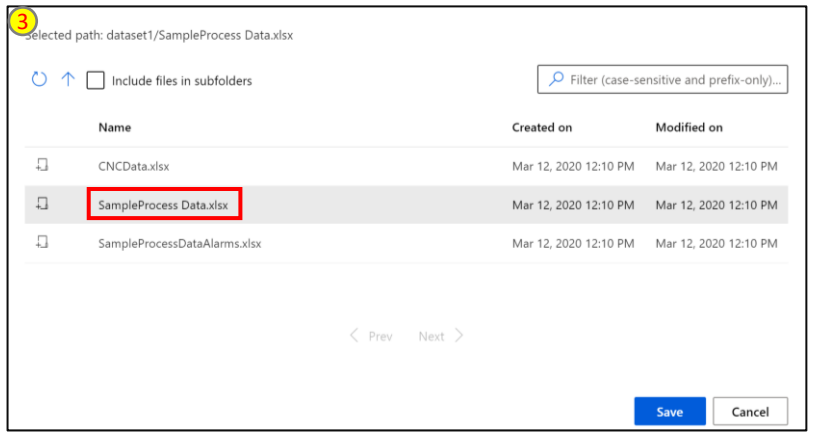
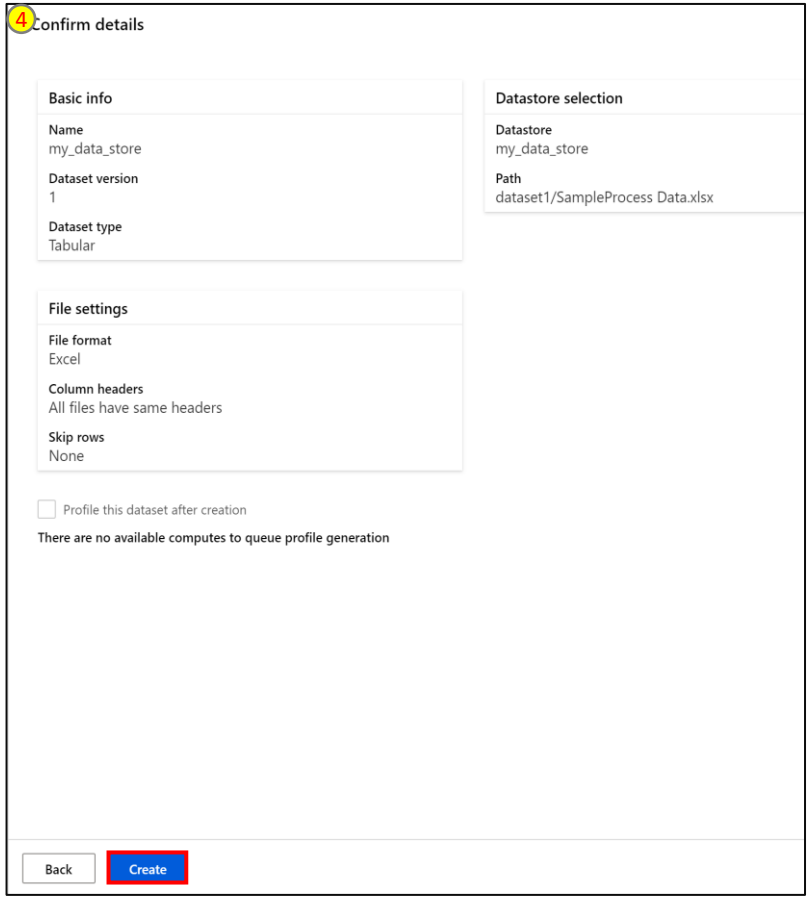
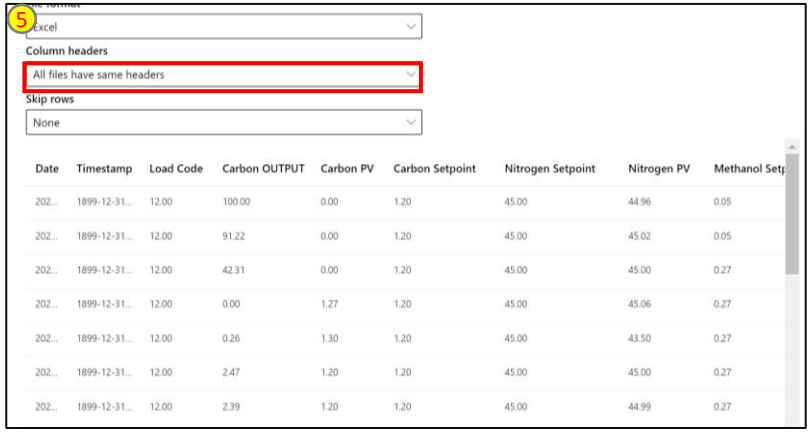


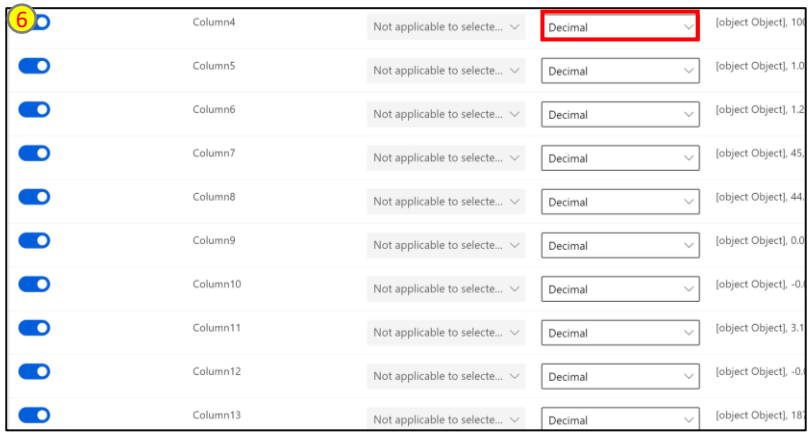
Create a Machine Learning workspace







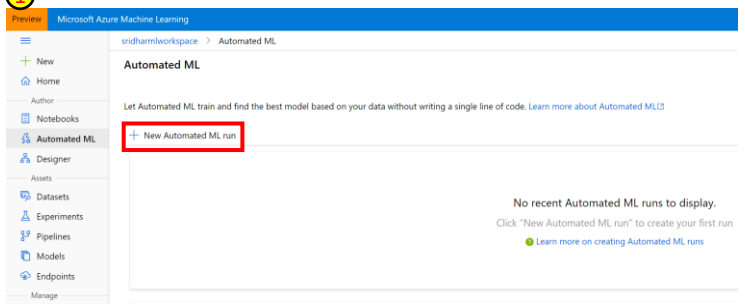




Create a Dataset

Create an Auto ML run

1



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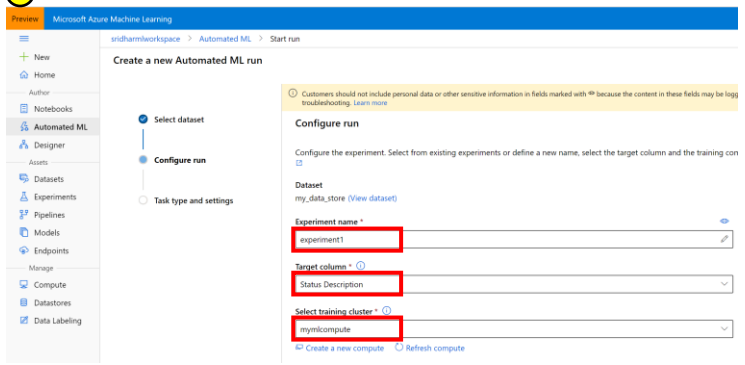

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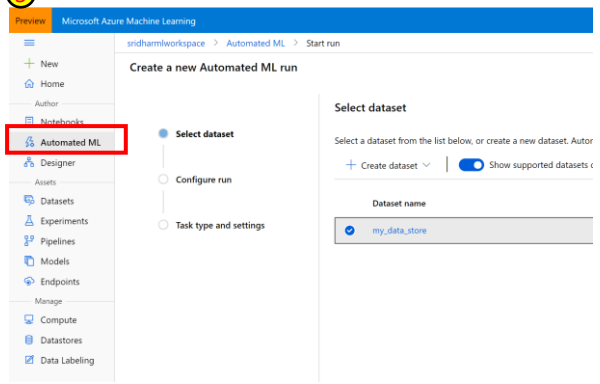

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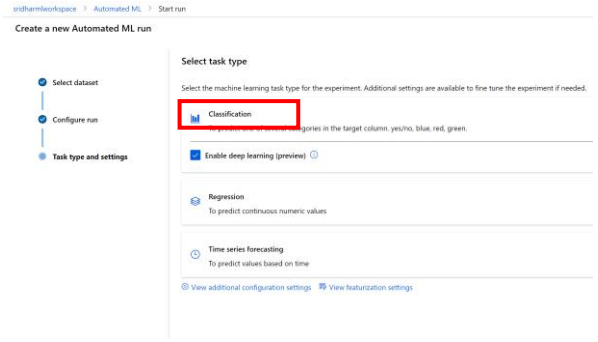

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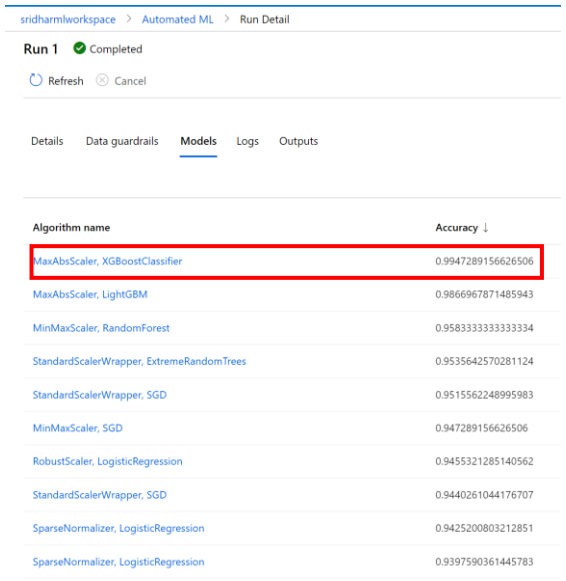

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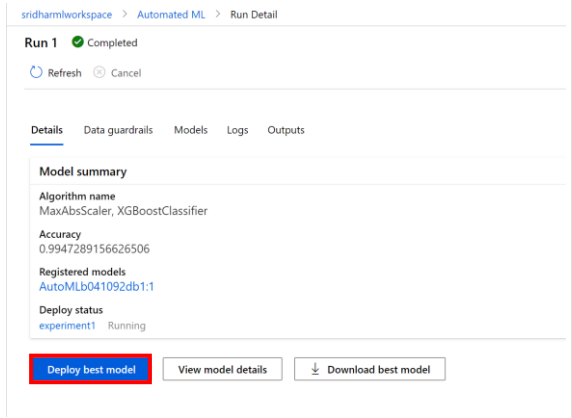

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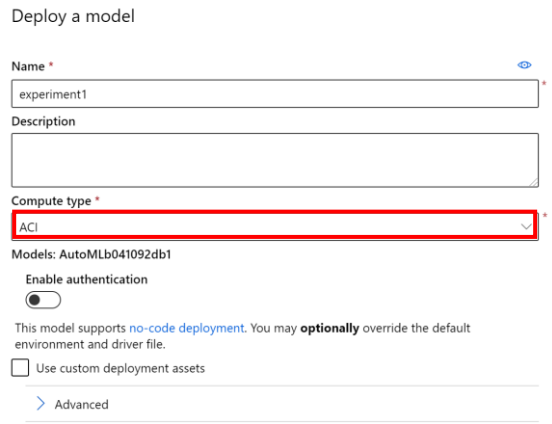

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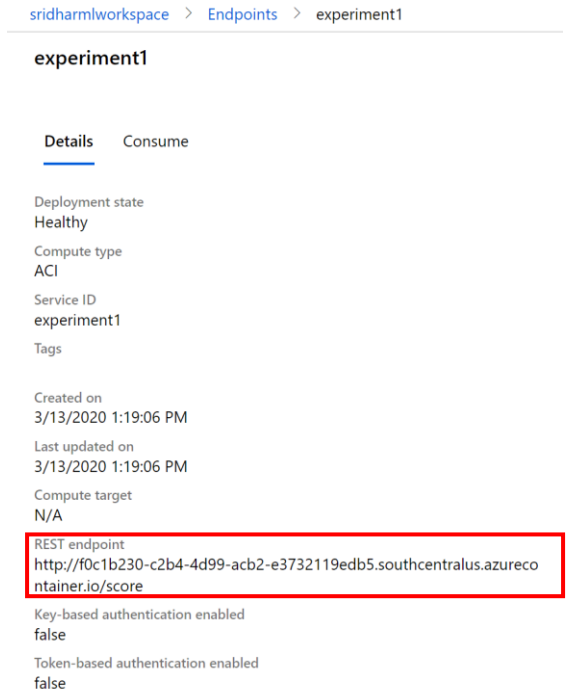
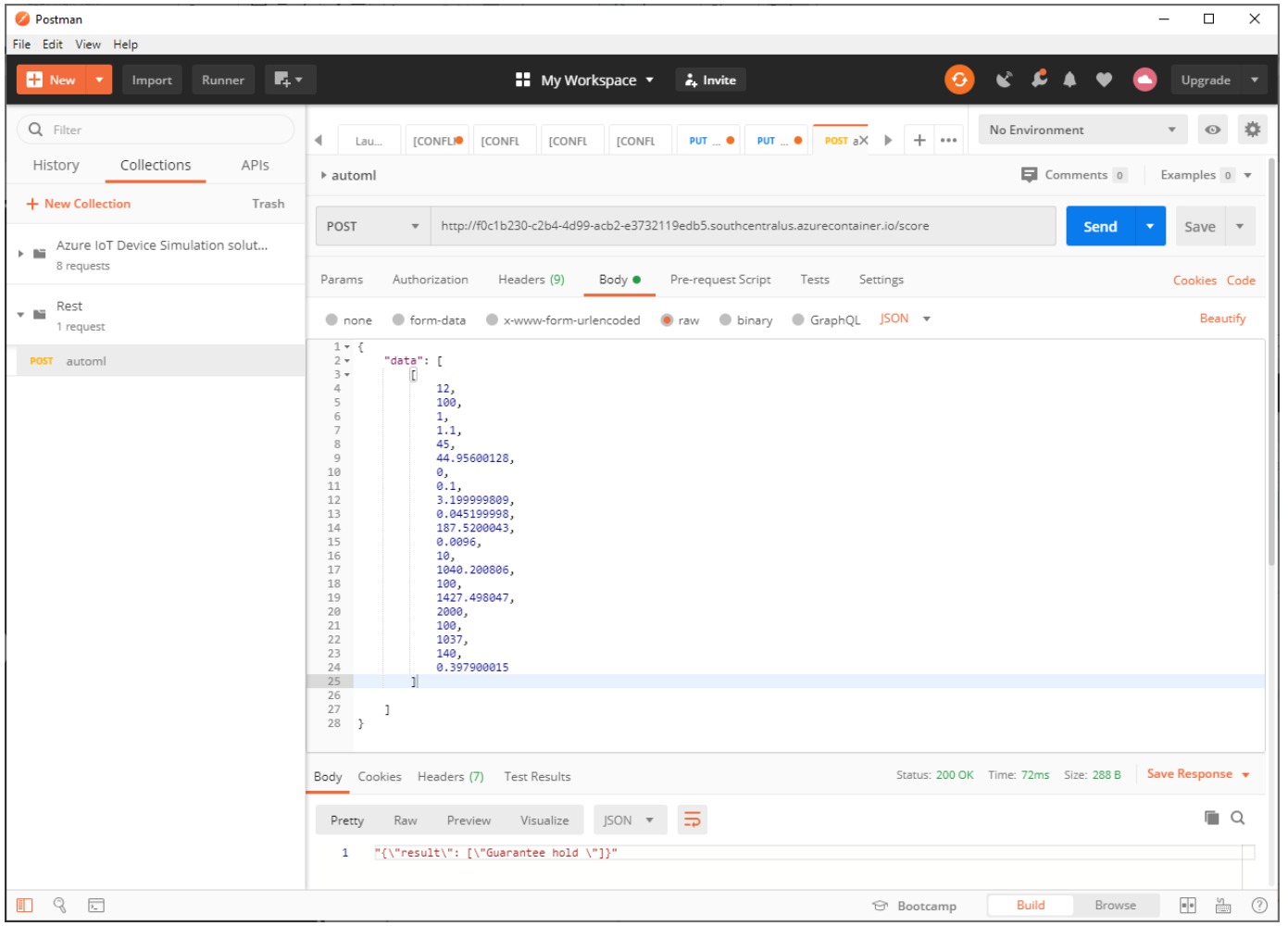


Deploy the best model

Score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New
Import
Runner
My Workspace
Invite
Upgrade
Filter
History
Collections
APIs
New Collection
Trash
Azure IoT Device Simulation solut...
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Rest
1 request
POST automl
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automl
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Examples 0
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Send
Save
Params
Authorization
Headers (9)
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Pre-request Script
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Settings
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Bootcamp
Build
Browse

Thank You