Deploy a model as a service

100 XP

10 minutes

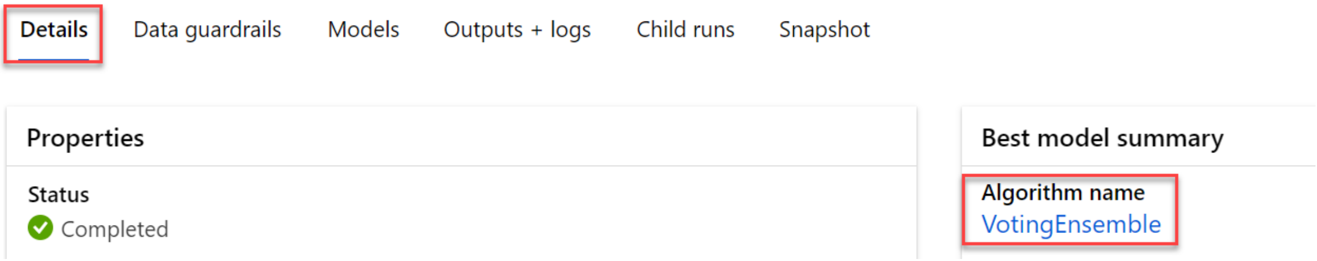
After you've used automated machine learning to train some models, you can deploy the best performing model as a service for client applications to use.

Deploy a predictive service

In Azure Machine Learning, you can deploy a service as an Azure Container Instances (ACI) or to an Azure Kubernetes Service (AKS) cluster. For production scenarios, an AKS deployment is recommended, for which you must create an *inference cluster* compute target. In this exercise, you'll use an ACI service, which is a suitable deployment target for testing, and does not require you to create an inference cluster.

1. In Azure Machine Learning studio, on the **Automated ML** page, select the run for your automated machine learning experiment.

2. On the **Details** tab, select the algorithm name for the best model.



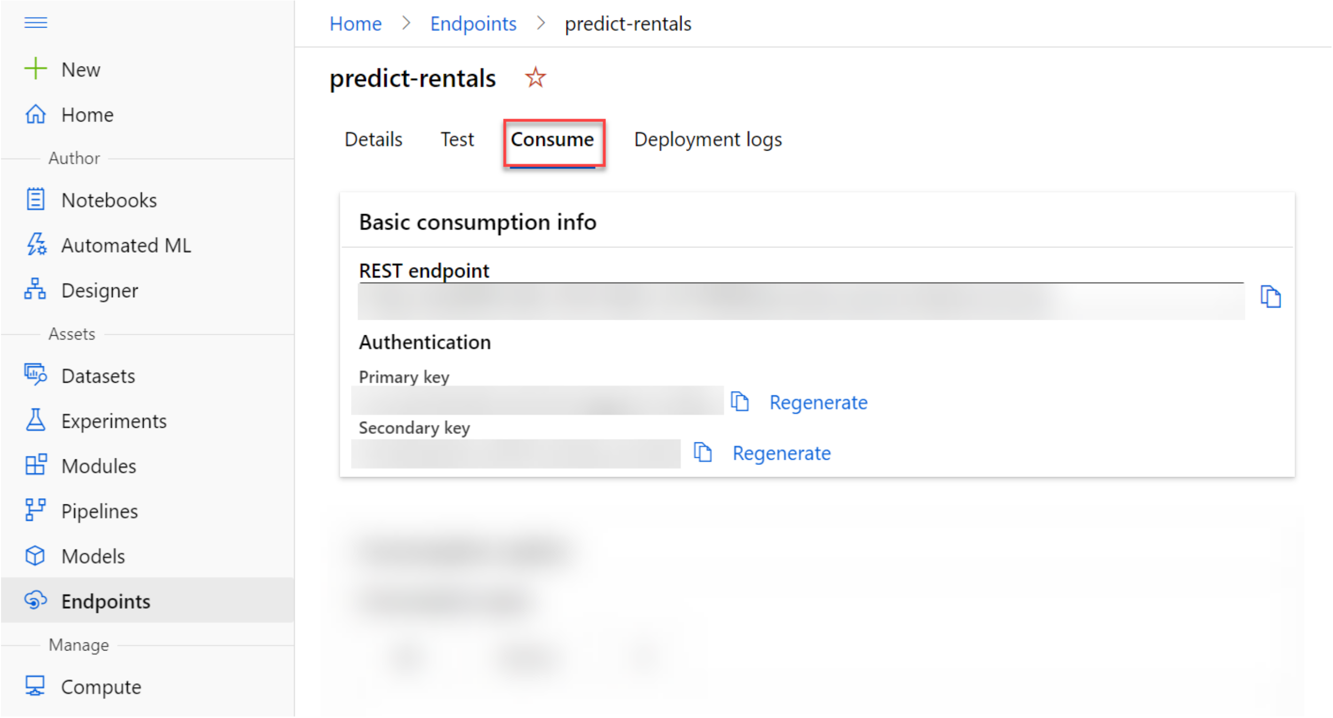
3. on the **Model** tab, select the **Deploy** button and use the **Deploy to web service** option to deploy the model with the following settings:

   - **Name**: predict-rentals
   - **Description**: Predict cycle rentals
   - **Compute type**: Azure Container Instance
   - **Enable authentication**: Selected

4. Wait for the deployment to start - this may take a few seconds. Then, in the **Model summary** section, observe the **Deploy status** for the **predict-rentals** service, which should be **Running**. Wait for this status to change to **Successful**. You may need to select ↻ **Refresh** periodically.

5. In Azure Machine Learning studio, view the **Endpoints** page and select the **predict-rentals** real-time endpoint. Then select the **Consume** tab and note the following information there. You need this information to connect to your deployed service from a client application.

   - The REST endpoint for your service
   - the Primary Key for your service



6. Note that you can use the ⧉ link next to these values to copy them to the clipboard.

Test the deployed service

Now that you've deployed a service, you can test it using some simple code.

1. With the **Consume** page for the **predict-rentals** service page open in your browser, open a new browser tab and open a second instance of Azure Machine Learning studio. Then in the new tab, view the **Notebooks** page (under **Author**).

2. In the **Notebooks** page, under **My files**, use the 🗋 button to create a new file with the following settings:

   - **File location**: Users/*your user name*
   - **File name**: Test-Bikes.ipynb
   - **File type**: Notebook
   - **Overwrite if already exists**: Selected

3. When the new notebook has been created, ensure that the compute instance you created previously is selected in the **Compute** box, and that it has a status of **Running**.

4. Use the ≪ button to collapse the file explorer pane and give you more room to focus on the **Test-Bikes.ipynb** notebook tab.

5. In the rectangular cell that has been created in the notebook, paste the following code:

Python Copy

```python
endpoint = 'YOUR_ENDPOINT' #Replace with your endpoint
key = 'YOUR_KEY' #Replace with your key

import json
import requests

#An array of features based on five-day weather forecast
x = [[1,1,2022,1,0,6,0,2,0.344167,0.363625,0.805833,0.160446],
    [2,1,2022,1,0,0,0,2,0.363478,0.353739,0.696087,0.248539],
    [3,1,2022,1,0,1,1,1,0.196364,0.189405,0.437273,0.248309],
    [4,1,2022,1,0,2,1,1,0.2,0.212122,0.590435,0.160296],
    [5,1,2022,1,0,3,1,1,0.226957,0.22927,0.436957,0.1869]]

#Convert the array to JSON format
input_json = json.dumps({"data": x})

#Set the content type and authentication for the request
headers = {"Content-Type":"application/json",
        "Authorization":"Bearer " + key}

#Send the request
response = requests.post(endpoint, input_json, headers=headers)

#If we got a valid response, display the predictions
if response.status_code == 200:
    y = json.loads(response.json())
    print("Predictions:")
    for i in range(len(x)):
        print (" Day: {}. Predicted rentals: {}".format(i+1, max(0,
round(y["result"][i]))))
else:
    print(response)
```

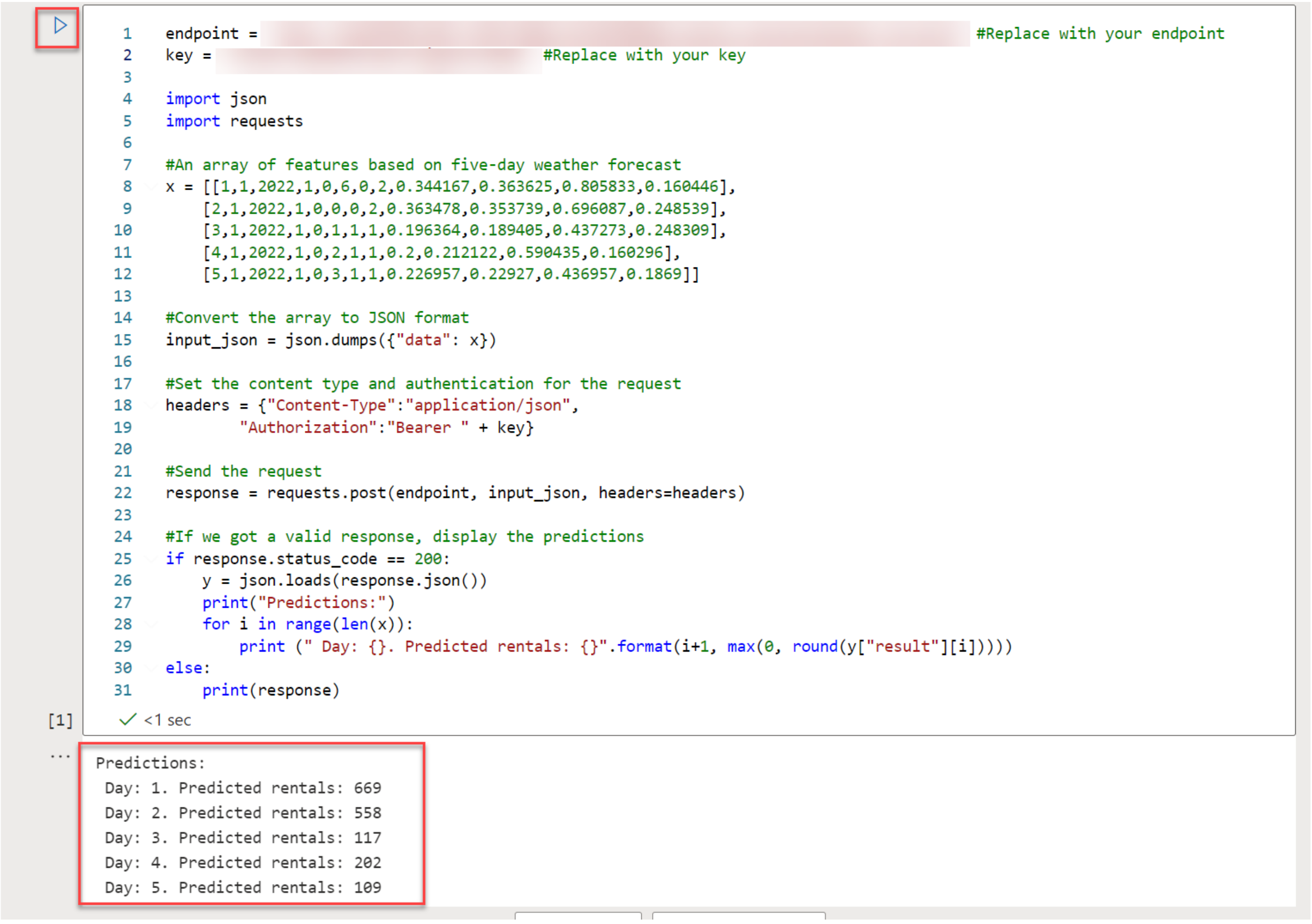
Note

Don't worry too much about the details of the code. It just defines features for a five day period using hypothetical weather forecast data, and uses the **predict-rentals** service you created to predict cycle rentals for those five days.

6. Switch to the browser tab containing the **Consume** page for the **predict-rentals** service, and copy the REST endpoint for your service. The switch back to the tab containing the notebook and paste the key into the code, replacing YOUR_ENDPOINT.

7. Switch to the browser tab containing the **Consume** page for the **predict-rentals** service, and copy the Primary Key for your service. The switch back to the tab containing the notebook and paste the key into the code, replacing YOUR_KEY.

8. Save the notebook, Then use the ▷ button next to the cell to run the code. You will get predictions for the number of bicycle rentals expected per day.



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```

```
Predictions:
 Day: 1. Predicted rentals: 669
 Day: 2. Predicted rentals: 558
 Day: 3. Predicted rentals: 117
 Day: 4. Predicted rentals: 202
 Day: 5. Predicted rentals: 109
```

9. Verify that predicted number of rentals for each day in the five day period are returned.

Let's review what you have done. You used a dataset of historical bicycle rental data to train a model. The model predicts the number of bicycle rentals expected on a given day, based on seasonal and meteorological *features*. In this case, the *labels* are number of bicycle rentals.

Next unit: Knowledge check