

# Essential Mathematics for Machine Learning and AI

## Module 4: Vectors and Matrices

### What You will Need

To complete this lab, you will need the following:

- A Microsoft account (for example, an *outlook.com*, *live.com*, or *hotmail.com* address)
- A Microsoft Azure subscription
- A Windows, Linux, or Mac OS X computer
- The lab files for this course

**Note:** To set up the required environment for the lab, follow the instructions in the [setup guide](#) for this course.

### Complete the Lab in Azure Notebooks

This lab is provided in a Jupyter notebook that you can upload to the Azure Notebooks in Azure Machine Learning Studio.

#### To Upload the Notebook

1. Open your browser and navigate to <https://portal.azure.com>, and sign in using your Microsoft account.
2. Create an Azure Machine Learning Workspace following the steps outlined in following guide (Select Portal in top right corner)  
- <https://docs.microsoft.com/en-us/azure/machine-learning/how-to-manage-workspace>
3. Once the Azure Machine Learning Workspace is created, open Machine Learning workspace and click “**Launch Studio**”.

## Manage your machine learning lifecycle

Use the Azure Machine Learning studio to build, train, evaluate, and deploy machine learning models. [Learn more](#)





[Launch studio](#)

[Getting started quickly](#)

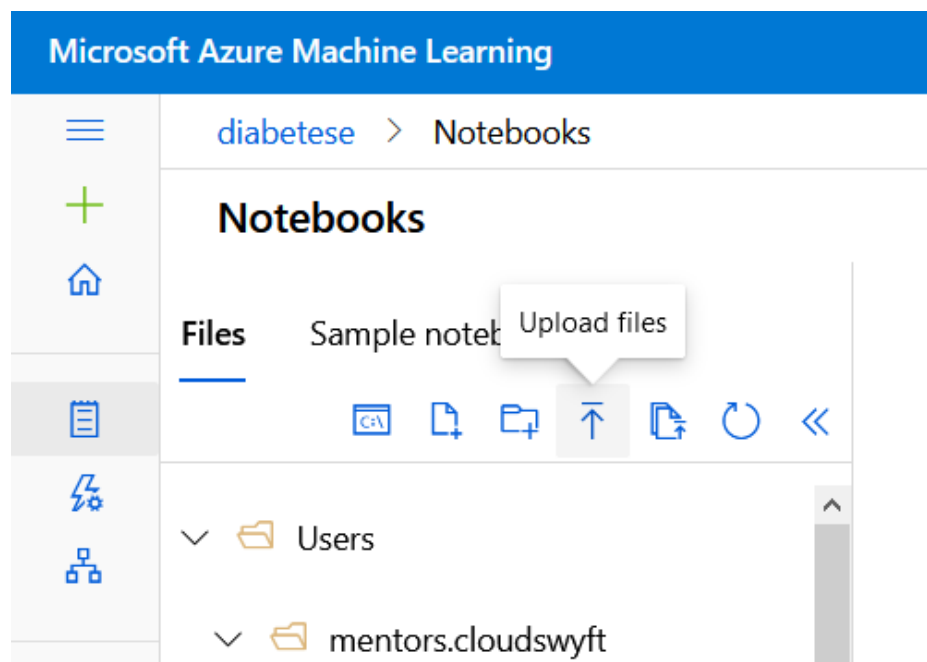
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- Click on **Start now** button under Notebooks.

### Azure Machine Learning studio

 Create new	 <b>Notebooks</b> Code with Python SDK and run sample experiments. <a href="#">Start now</a>	 <b>Automated ML</b> Automatically train and tune a model using a target metric. <a href="#">Start now</a>	 <b>Designer</b> Drag-and-drop interface from prepping data to deploying models. <a href="#">Start now</a>
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- Select upload files button and navigate to the relevant notebook (from “04-01-Data and Visualization.ipynb” to “04-06-Hypothesis Testing.ipynb”) file in the **Module04** folder inside the “**Lab Files**” folder. Then click **Open**.

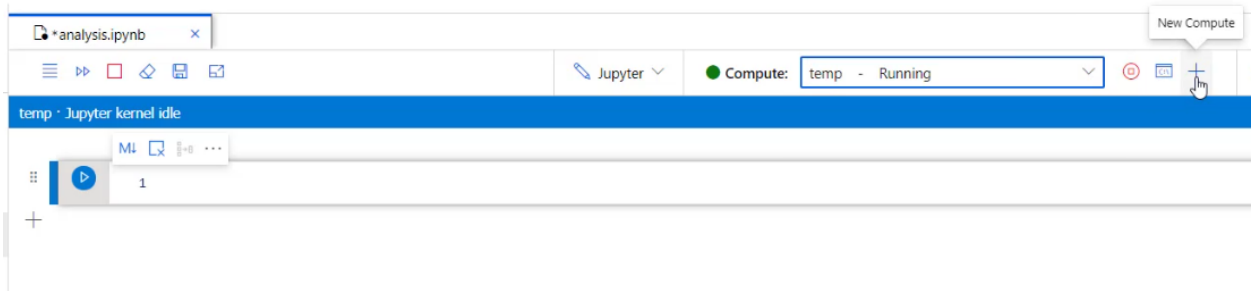


- In the box that pops up check **I trust content of the file** box and click **Upload**.

7. When the file has been uploaded, open it.

Note: steps 8 - 10 are required only once to create the compute

8. click on + icon to create a new compute. (Note: You need to do this only if you do not already have created a compute)

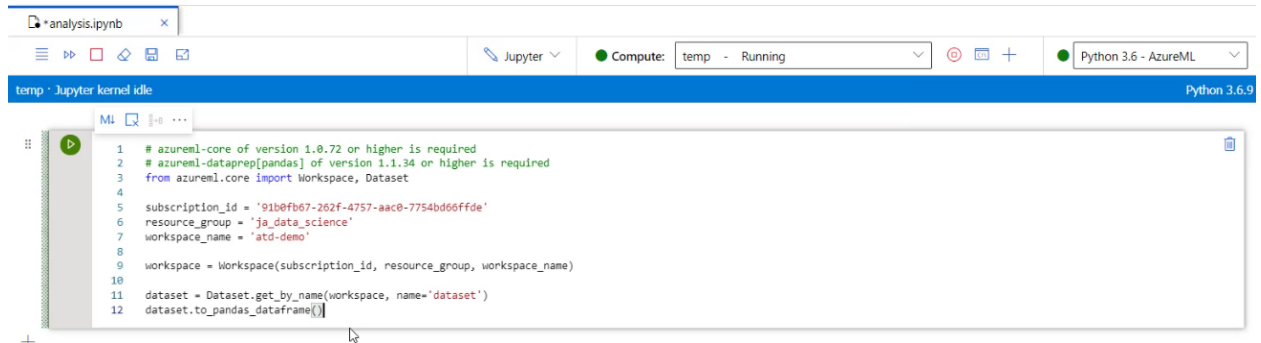


9. Enter compute name and click create as show in following image:

A screenshot of the 'New compute instance' dialog box. The dialog has a title bar with a close button. Inside, there are several fields: 'Compute name' with a required asterisk and an info icon, containing the text 'temp-compute'; 'Region' with a required asterisk and an info icon, showing 'southeastasia'; 'Virtual machine type' with a required asterisk and an info icon, showing 'CPU (Central Processing Unit)'; and 'Virtual machine size' with a required asterisk and an info icon, showing 'Standard\_DS3\_v2' and its specifications '4 Cores, 14 GB (RAM), 28 GB (Disk)'. There is also a toggle for 'Enable SSH access' which is currently turned on. Below these fields is a link for 'Advanced settings'. At the bottom, there are three buttons: 'Download a template for automation', 'Create' (highlighted in blue), and 'Cancel'.

10. Wait for compute to get created. (If you have already created compute on your azure, you can use that)

11. Select the Python 3.6 – AzureML in the top right drop box as shown:



```
1 # azureml-core of version 1.0.72 or higher is required
2 # azureml-dataprep[pandas] of version 1.1.34 or higher is required
3 from azureml.core import Workspace, Dataset
4
5 subscription_id = '91b0fb67-262f-4757-aac0-7754bd66ffde'
6 resource_group = 'ja_data_science'
7 workspace_name = 'atd-demo'
8
9 workspace = Workspace(subscription_id, resource_group, workspace_name)
10
11 dataset = Dataset.get_by_name(workspace, name='dataset')
12 dataset.to_pandas_dataframe()
```

12. Now follow the instructions in notebook. You can run the code in the shell by clicking on green play button on top-left of the shell.