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Azure ML Studio - Overview

Citizen Analytics – An Initiative by Data Science Team

START ▶

Learning Objectives

By the end of this module, you will be able to:

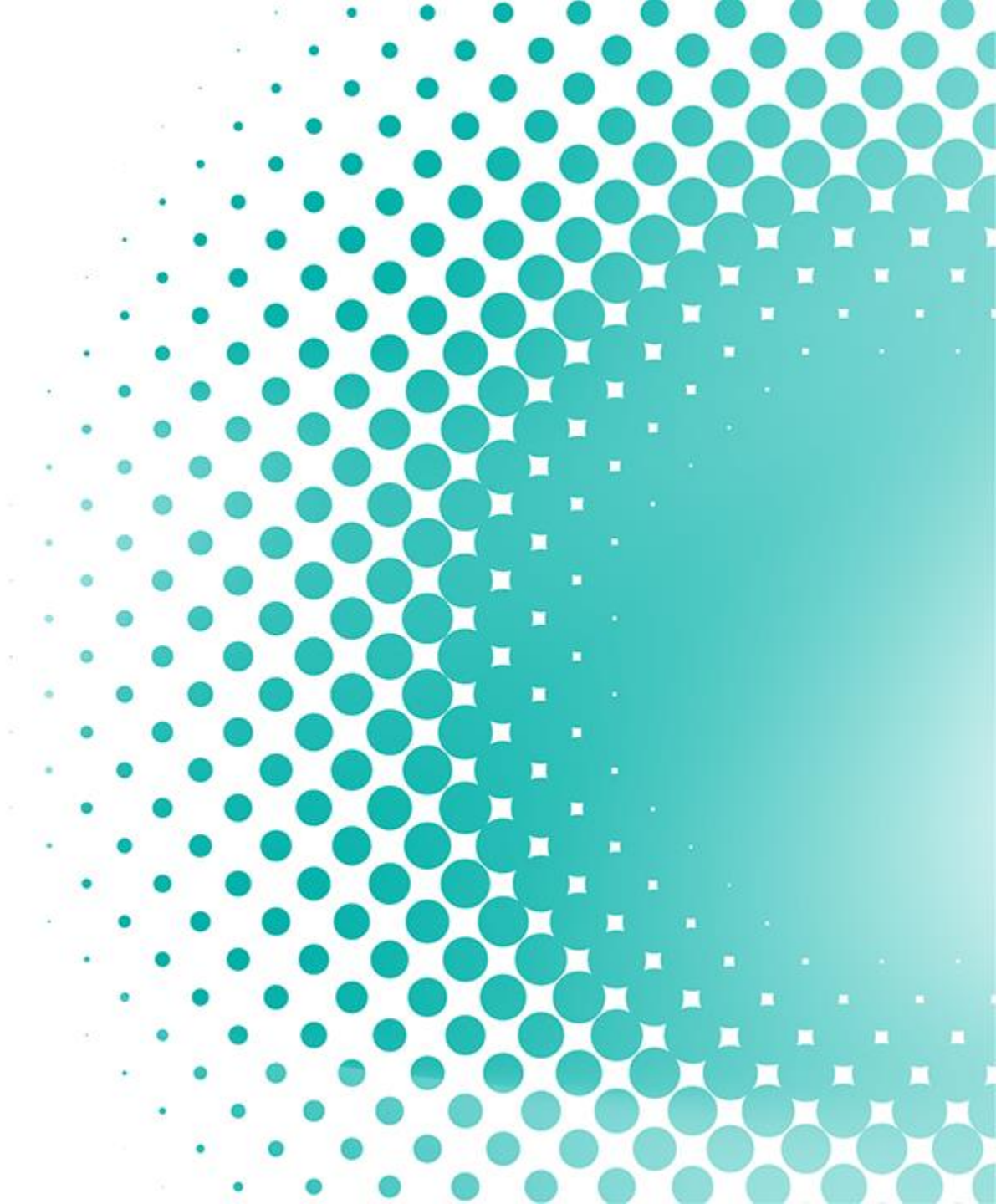
01 Understand the concept of Azure Machine Learning and Machine Learning Studio (classic).

02 Differentiate between Azure Machine Learning and Machine Learning Studio (classic).

03 Identify the components available in Azure Machine Learning Studio.

Content

Azure ML Studio



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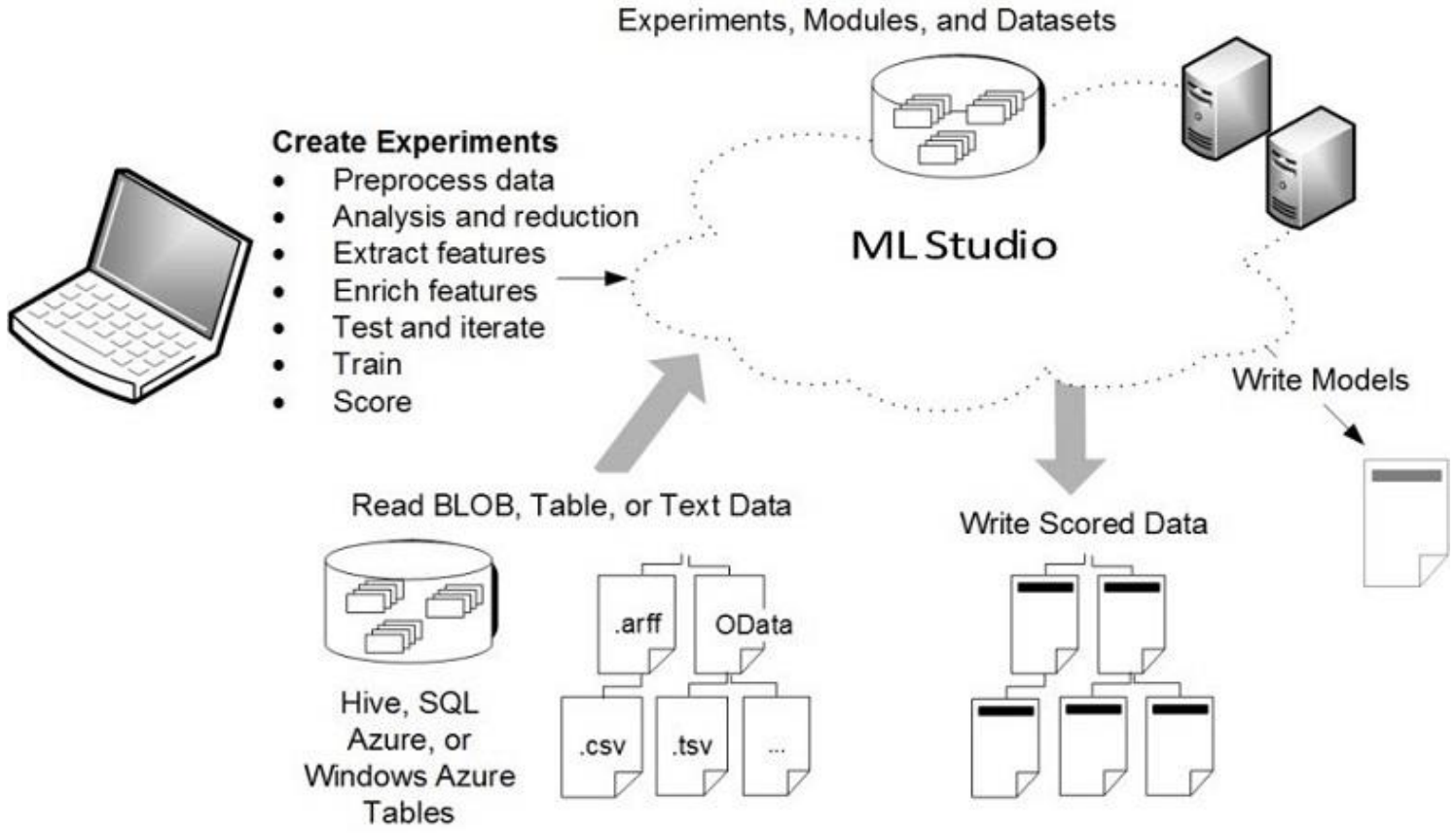
Current challenges with advanced analytics projects

There is a huge demand for advanced analytics projects, but below are the constraints which organization is facing currently:

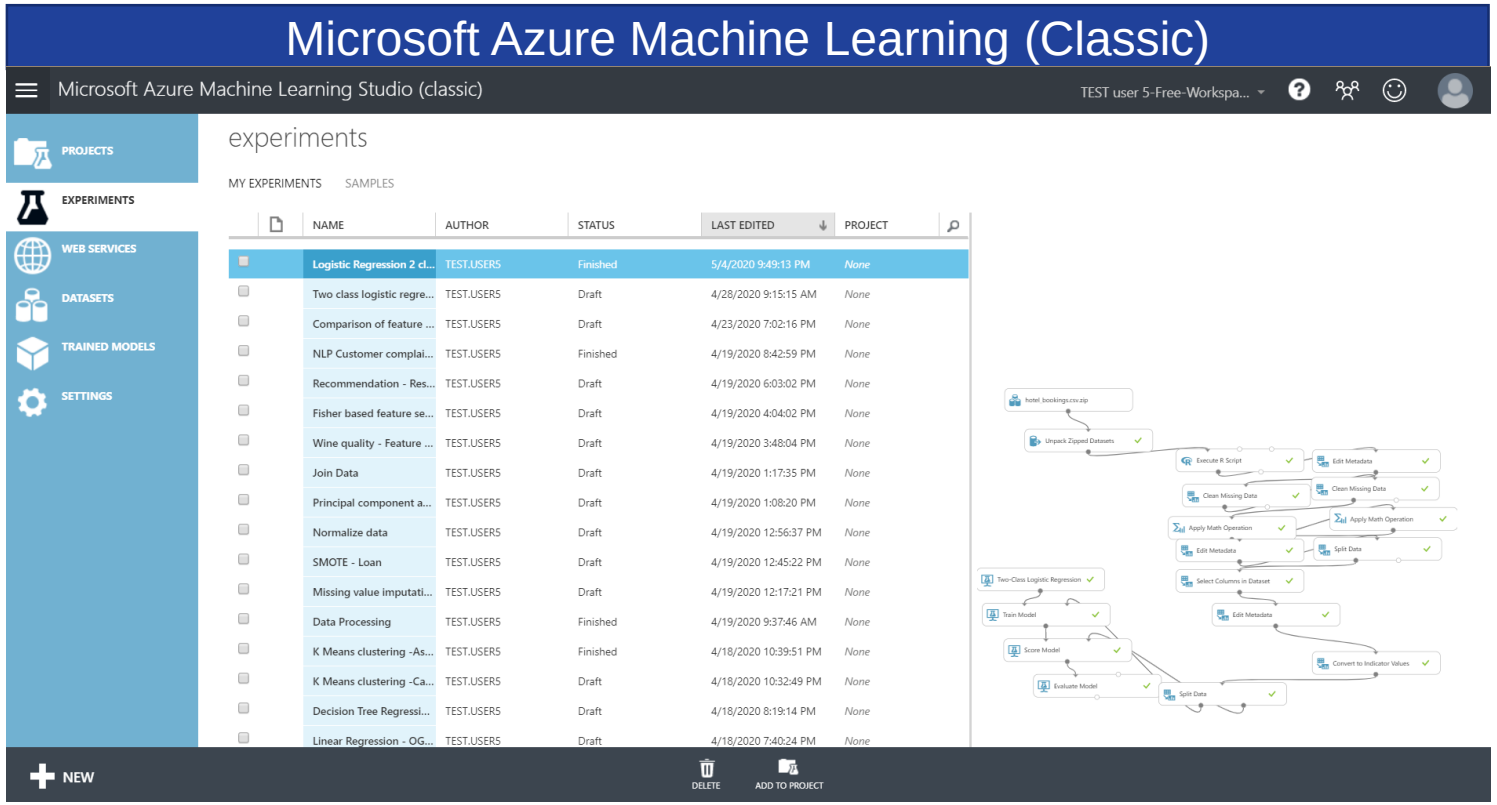
- The need for people with a **very specific, very expensive and a very hard-to-come-by skillset.**
- The **tools and methods to develop machine learning applications are often very expensive** and have historically led to projects that take months to develop and implement.
- Models are typically developed and consumed in a **very specific programming language for a very specific application** and are not regularly available for use across the organization.

Azure ML Studio - Need of the hour solution



What is Azure ML?

- Azure ML is an **end-to-end, cloud-based, advanced/predictive analytics platform**.
- Azure ML allows users to **import training data, build, train, and deploy machine learning models, and even predict outcomes and cluster data all from a simple web browser.**
- Provide a large library of **pre-built machine learning algorithms** and modules
- Allows for extending models with custom **build R and Python code**
- Once deployed, the model can then be accessed from almost anywhere including **custom applications, web sites, Azure Data Factory, Excel and Power BI**



<u>There are 2 versions of Azure ML available:</u>

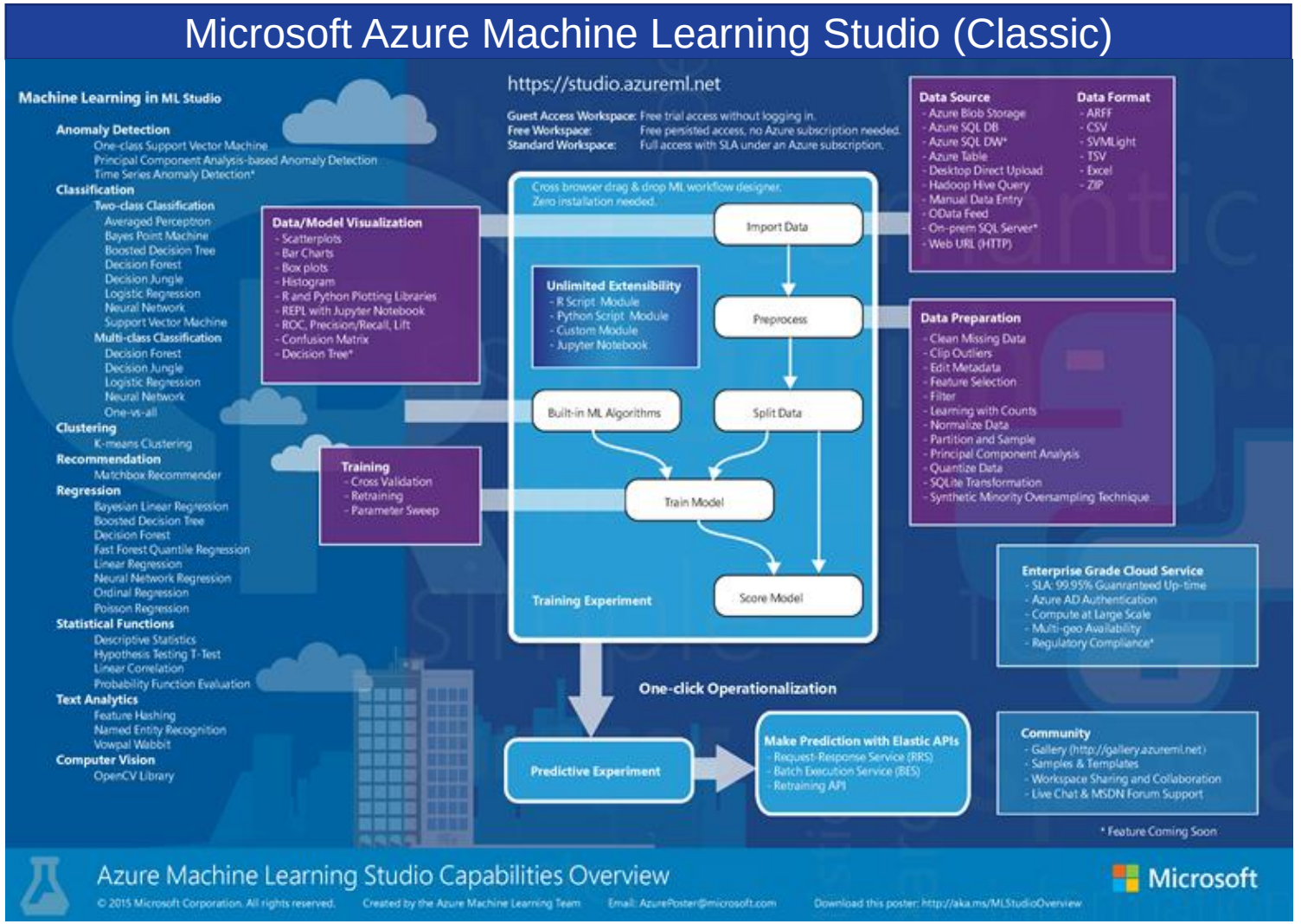
- Machine Learning Studio (classic)
- Azure Machine Learning

Why Azure ML Studio (Classic)?

The most significant reasons to choose Azure ML for Machine Learning solutions

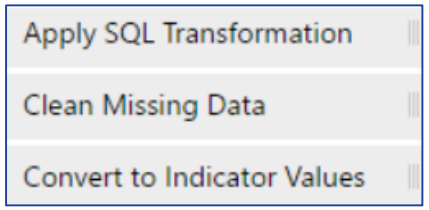
- **Use Machine Learning as a Service**
- **Easy & Flexible building interface**
- **Wide range of supported algorithms**
- **Easy implementation of web services**
- **Great documentation for Machine Learning Solutions**
- **The ability to train/retrain models through APIs**
- **Learn with terabyte-sized data**

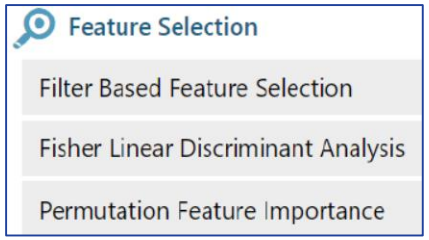
With the above significant reasons, it is obvious for businesses to go ahead with auto ML solutions like Azure ML

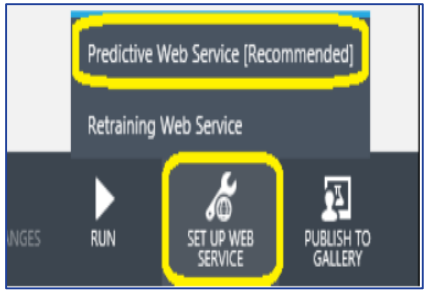


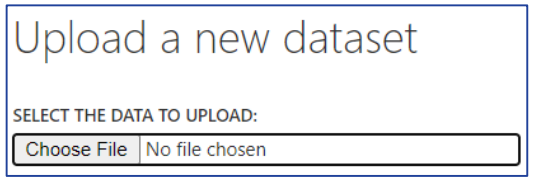
Architecture and concepts

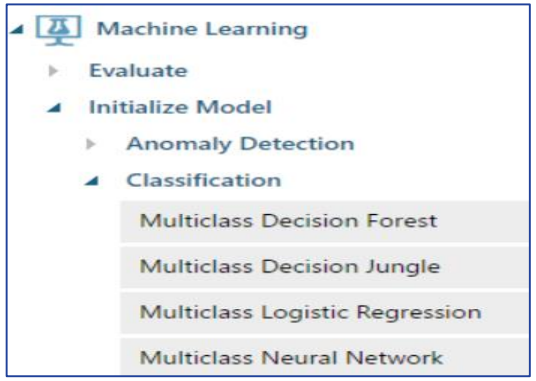
Azure ML Studio (Classic) - ML Model Workflow

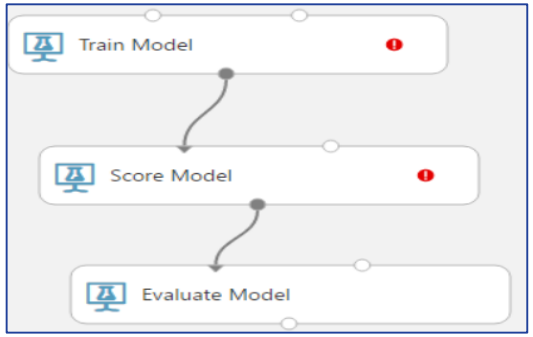












1. Get the data
2. Prepare the data
3. Feature selection
4. Model development
5. Train & evaluate the model
6. Deploy the model

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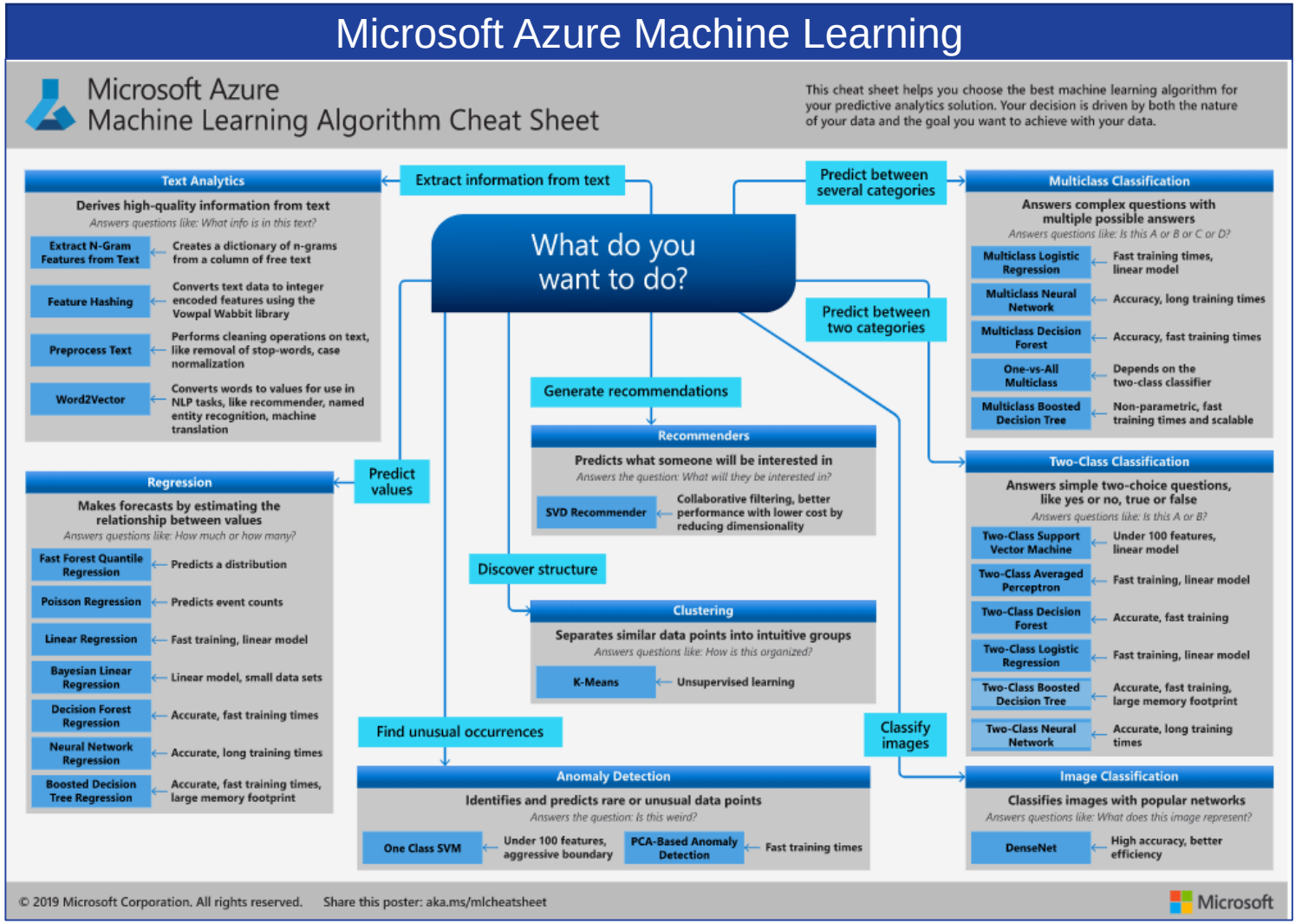
ML Model: Choose The Best Algorithm

What algorithms should be used?

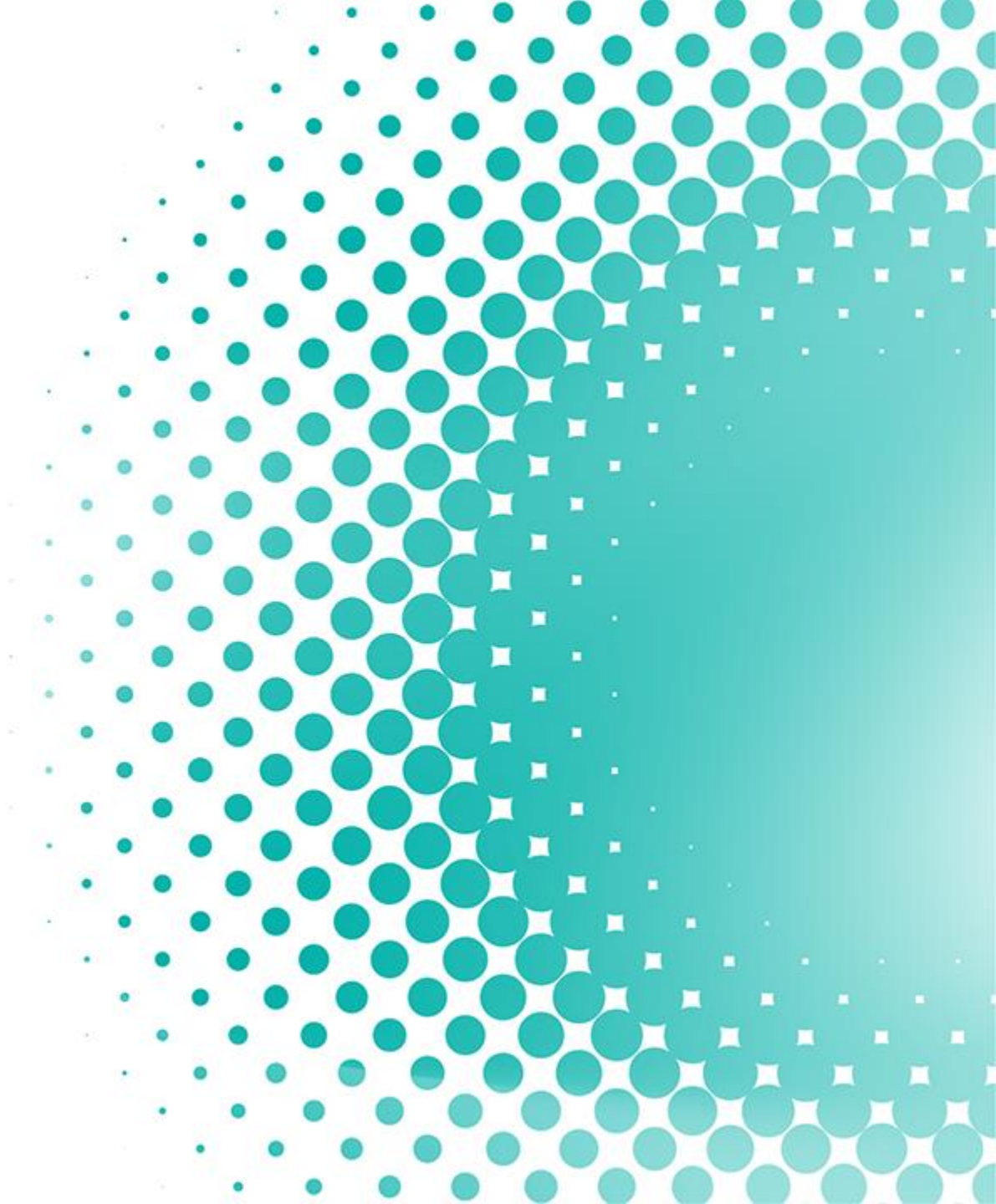
- **Scenario: Extract information from text**
  - Text analytics
- **Scenario: Predict values**
  - Regression
- **Scenario: Find unusual occurrences**
  - Anomaly Detection
- **Scenario: Discover structures**
  - Clustering
- **Scenario: Generate Recommendations**
  - Recommendation
- **Scenario: Classification**
  - Two–class
  - Multi-class



Differences: Machine Learning Studio (Classic) vs Azure Machine Learning

	Features	Machine Learning Studio (classic)	Azure Machine Learning
01.	**Drag and drop interface**	Supported	Supported
02.	**Experiment**	Scalable (10-GB training data limit)	**Scale with compute target**
03.	**Training / Deployment compute**	Proprietary compute target, CPU support only	Wide range of customizable training compute targets. **Includes GPU and CPU support**
04.	**ML Pipeline**	Not supported	Build flexible, modular pipelines to automate workflows
05.	**MLOps**	Basic model management and deployment	Advanced model management and deployment
06.	**Automated model training and hyperparameter tuning**	Not supported	Supported in the SDK and visual workspace
07.	**Data drift detection**	Not supported	Supported in the SDK and visual workspace

Getting started with Azure ML



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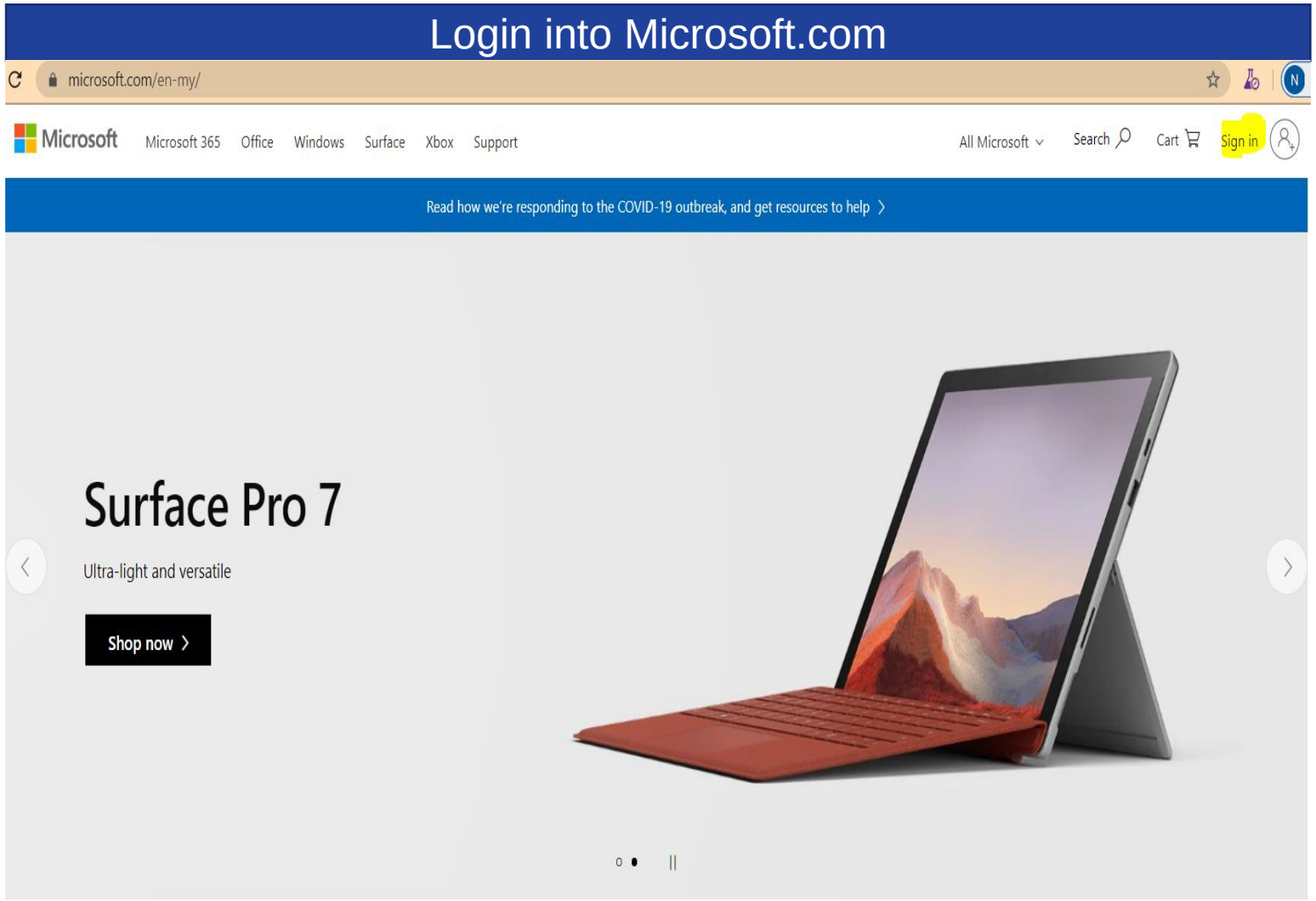
Create Azure account

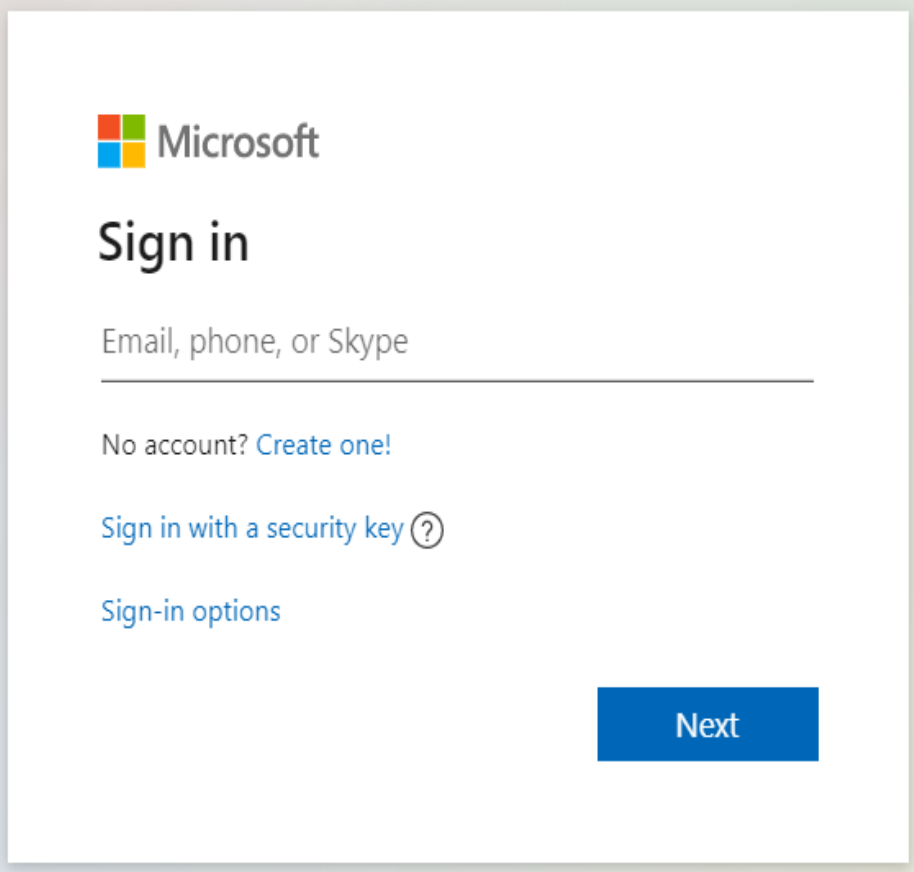
Login into Microsoft.com

Click on “**Sign In**”

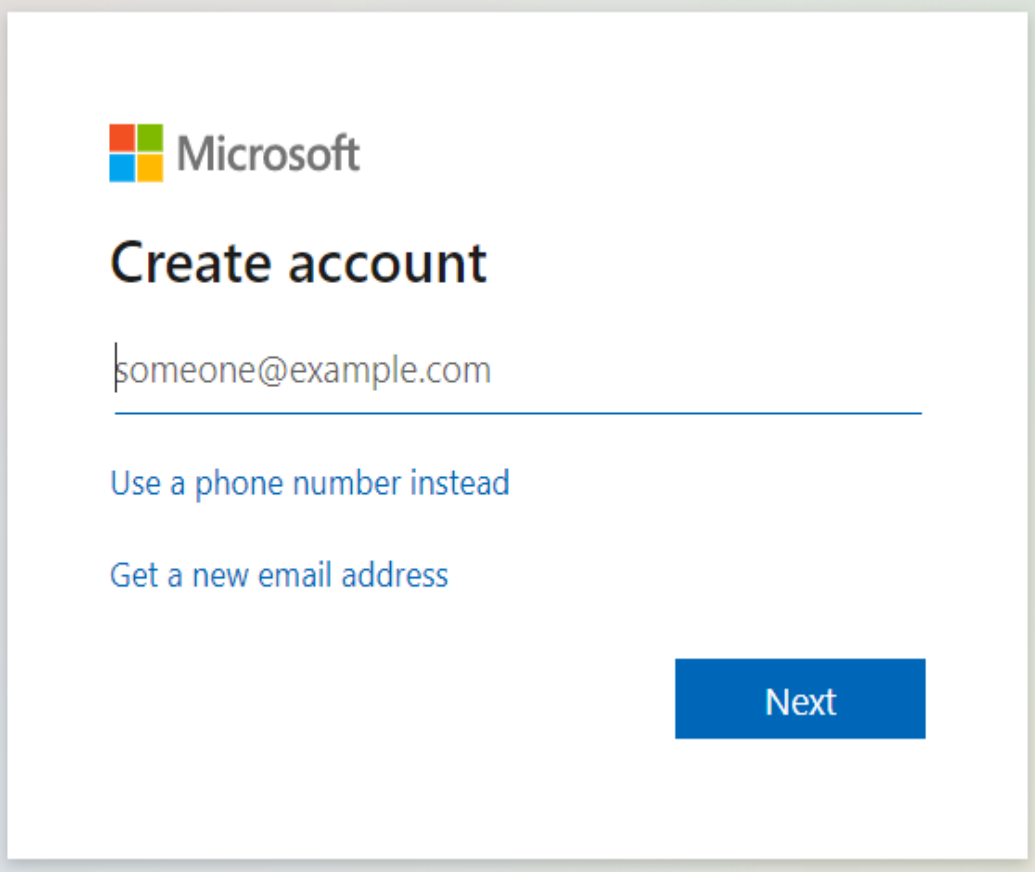


Create Azure account

Click on “**Create One**”

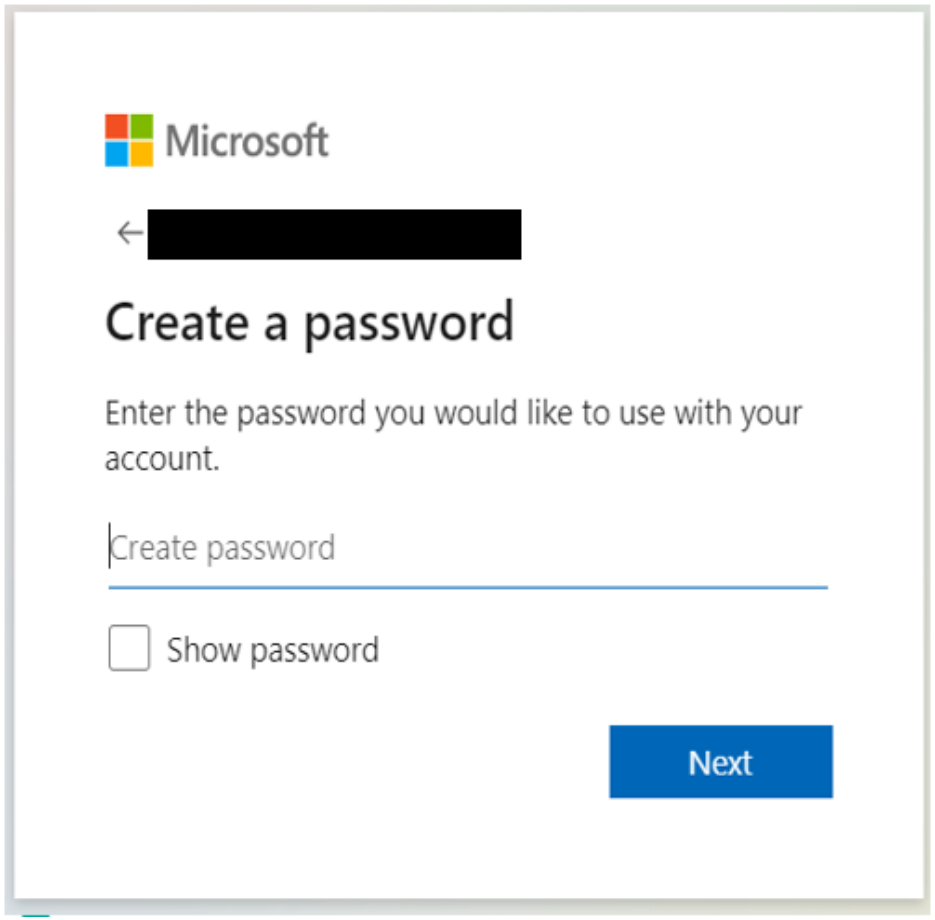


Create a new account. Put your email Id

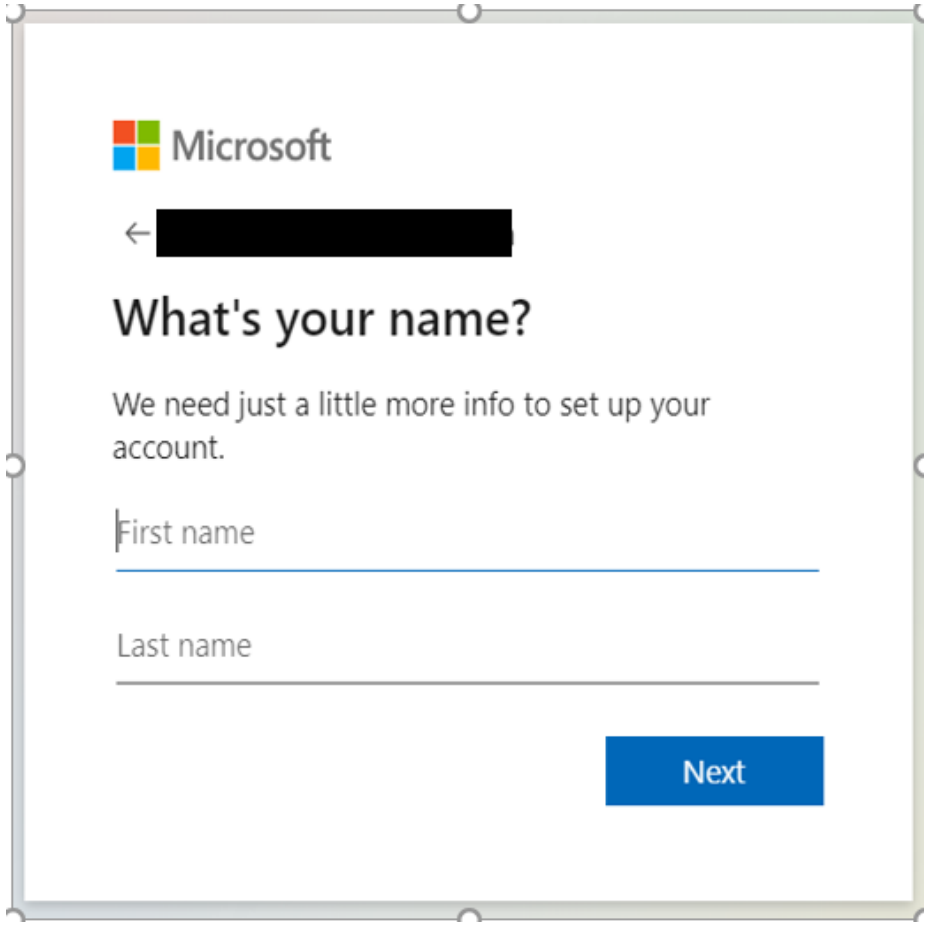


Create Azure account

Enter a password for the account

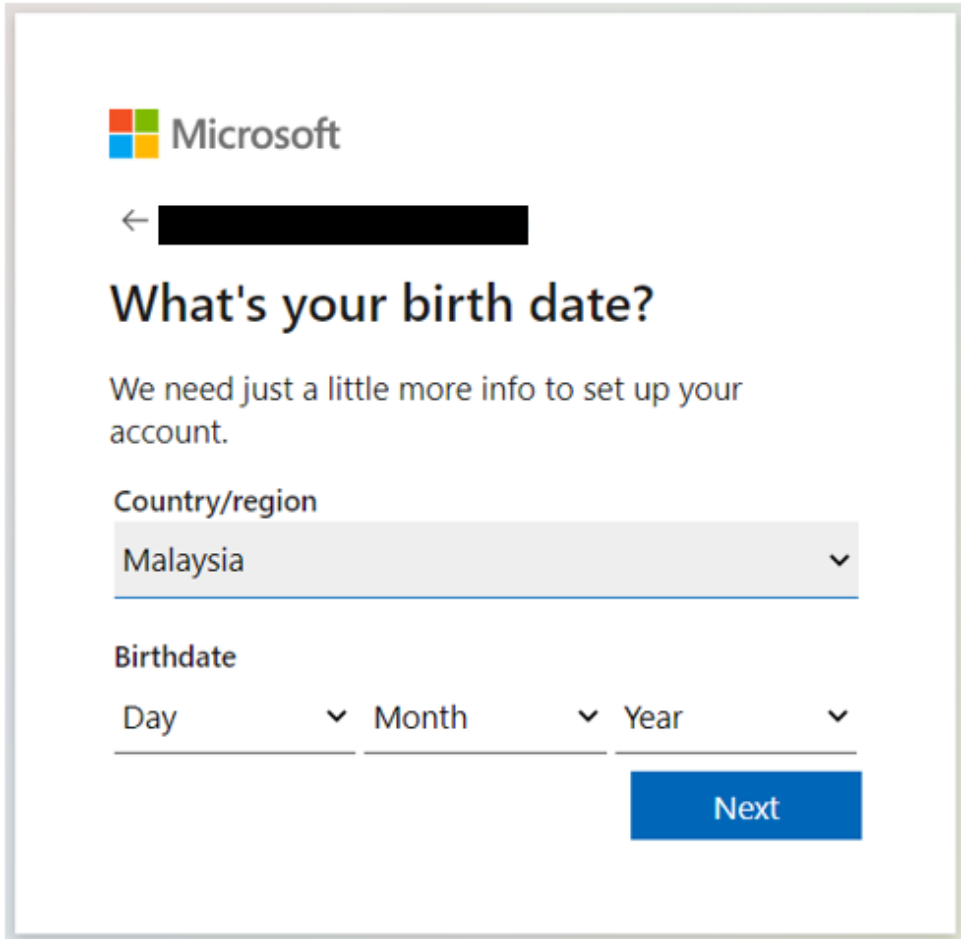


Enter account details

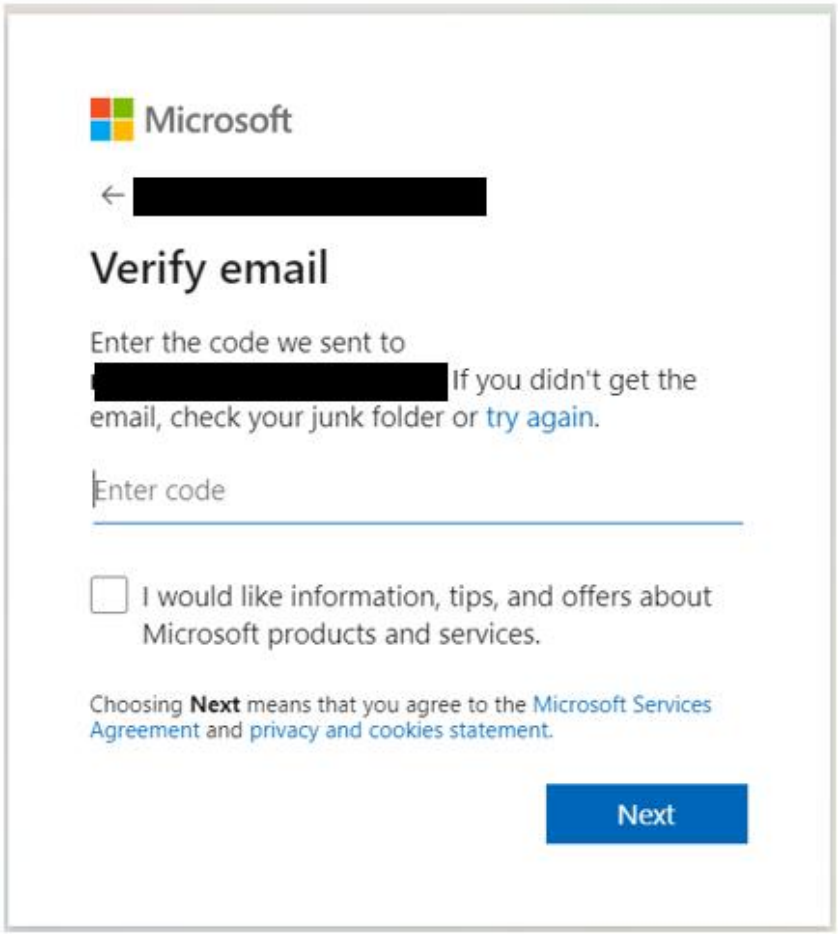


Create Azure account

Provide the account related details

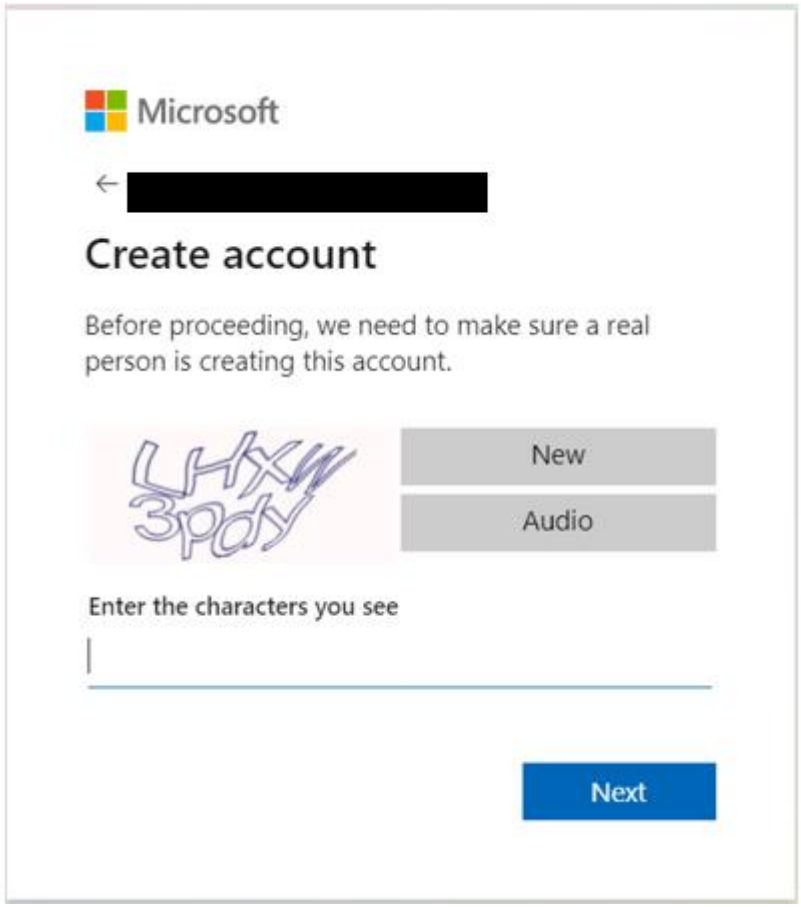


Enter the code sent to your email

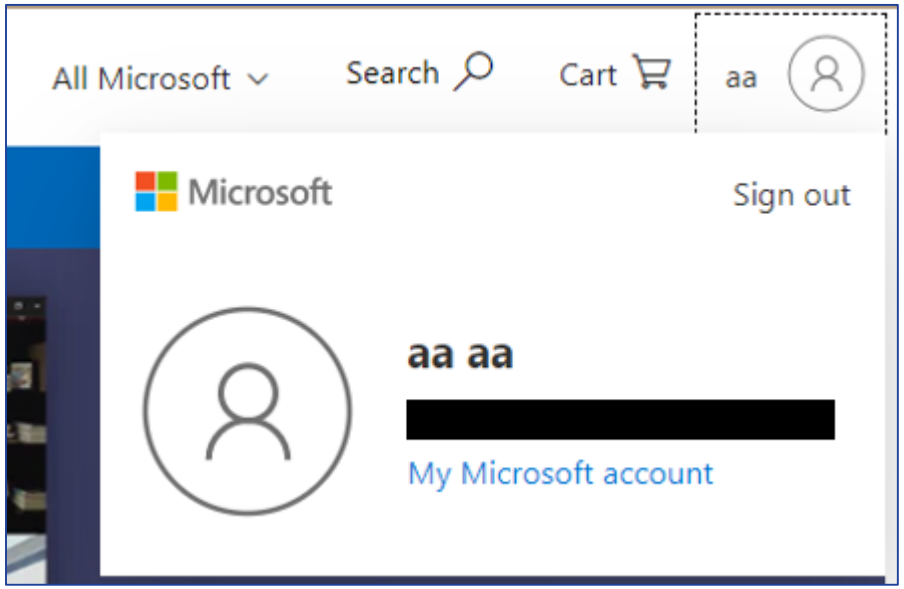


Create Azure account

Enter CAPTCHA

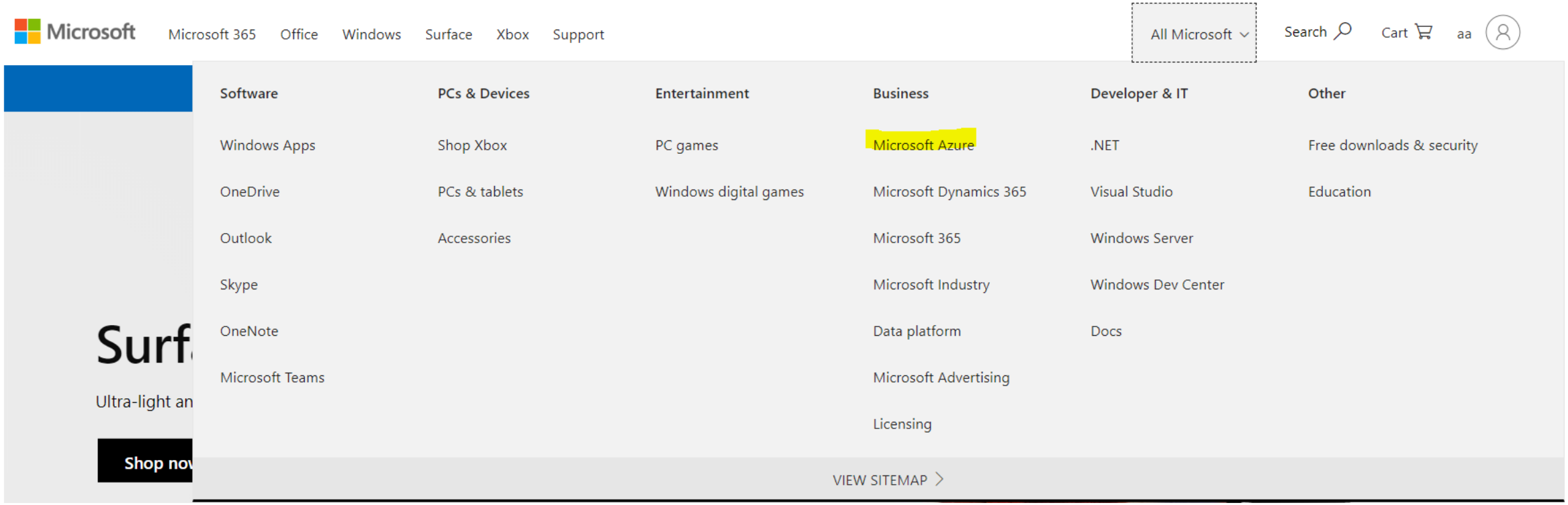


Account has beensuccessfully created



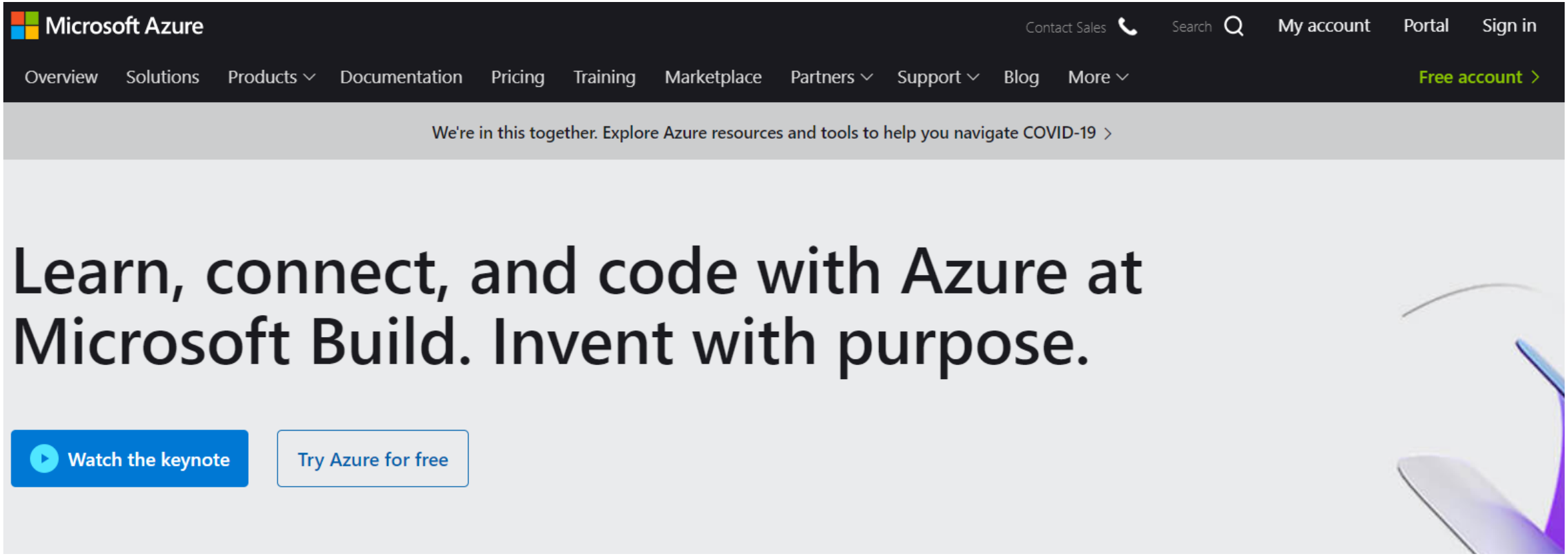
Azure Portal

Click on “**Microsoft Azure**”



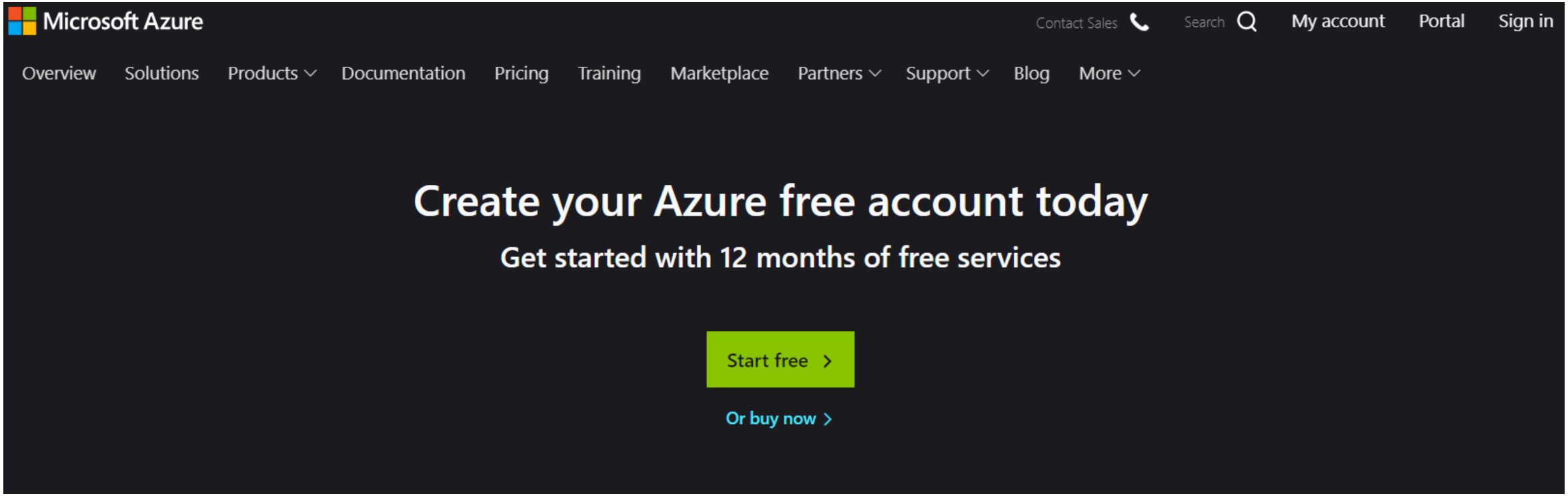
Azure Portal

Click on “**Try Azure for free**”



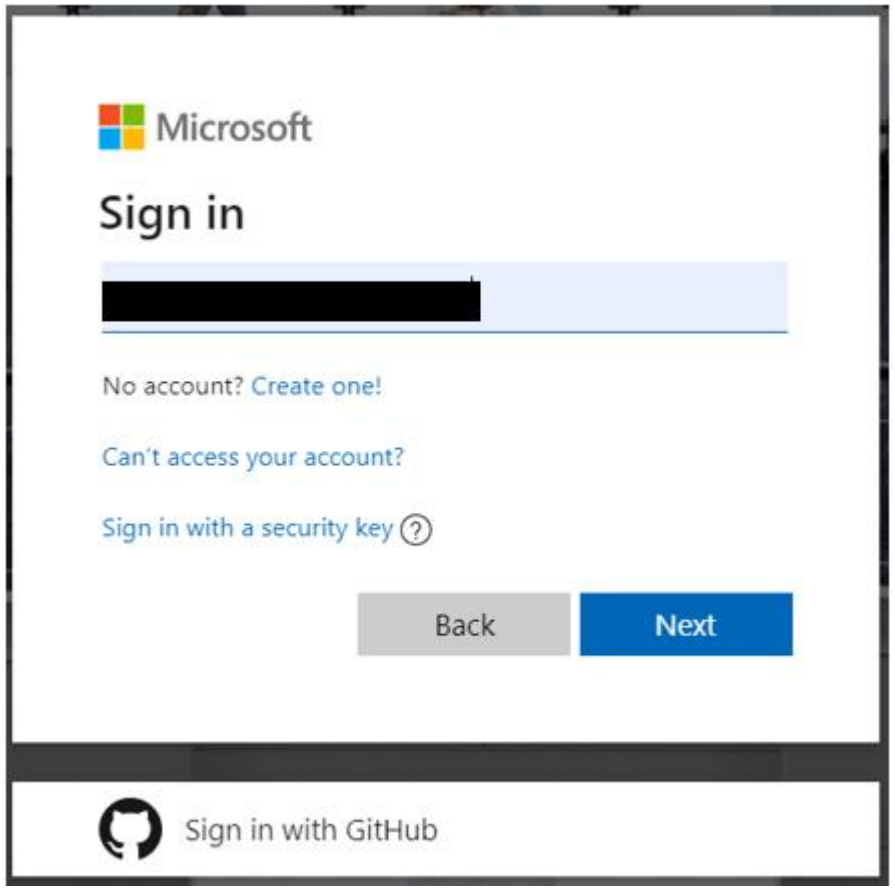
Azure Portal

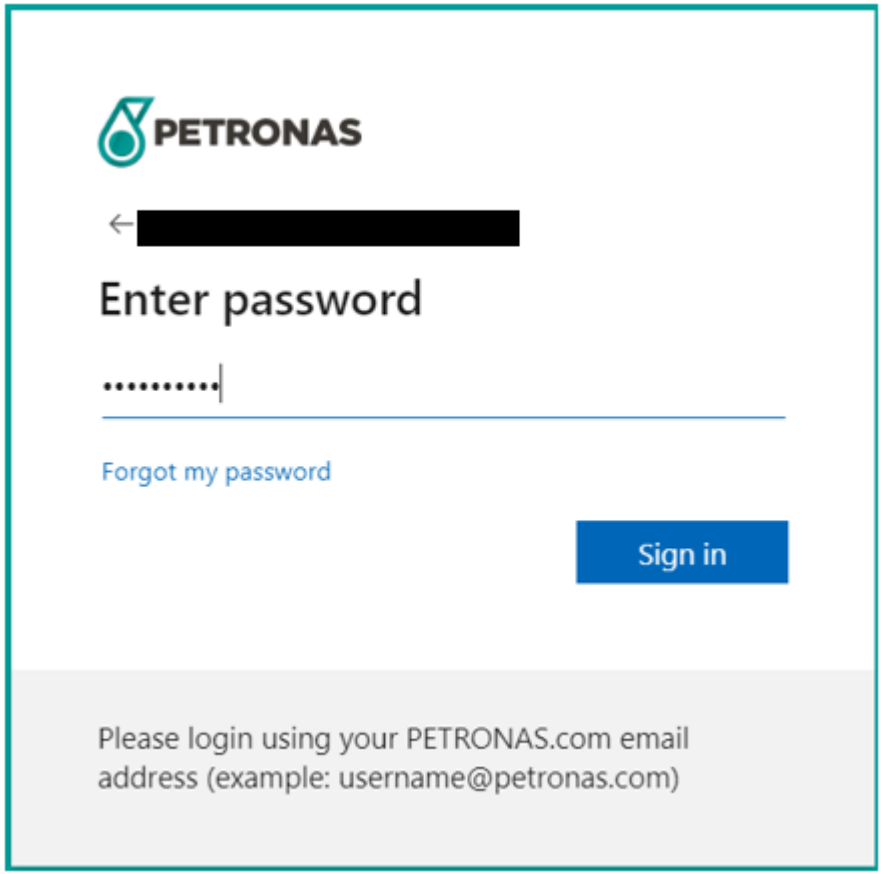
Click on “**Start free**”



Azure Portal

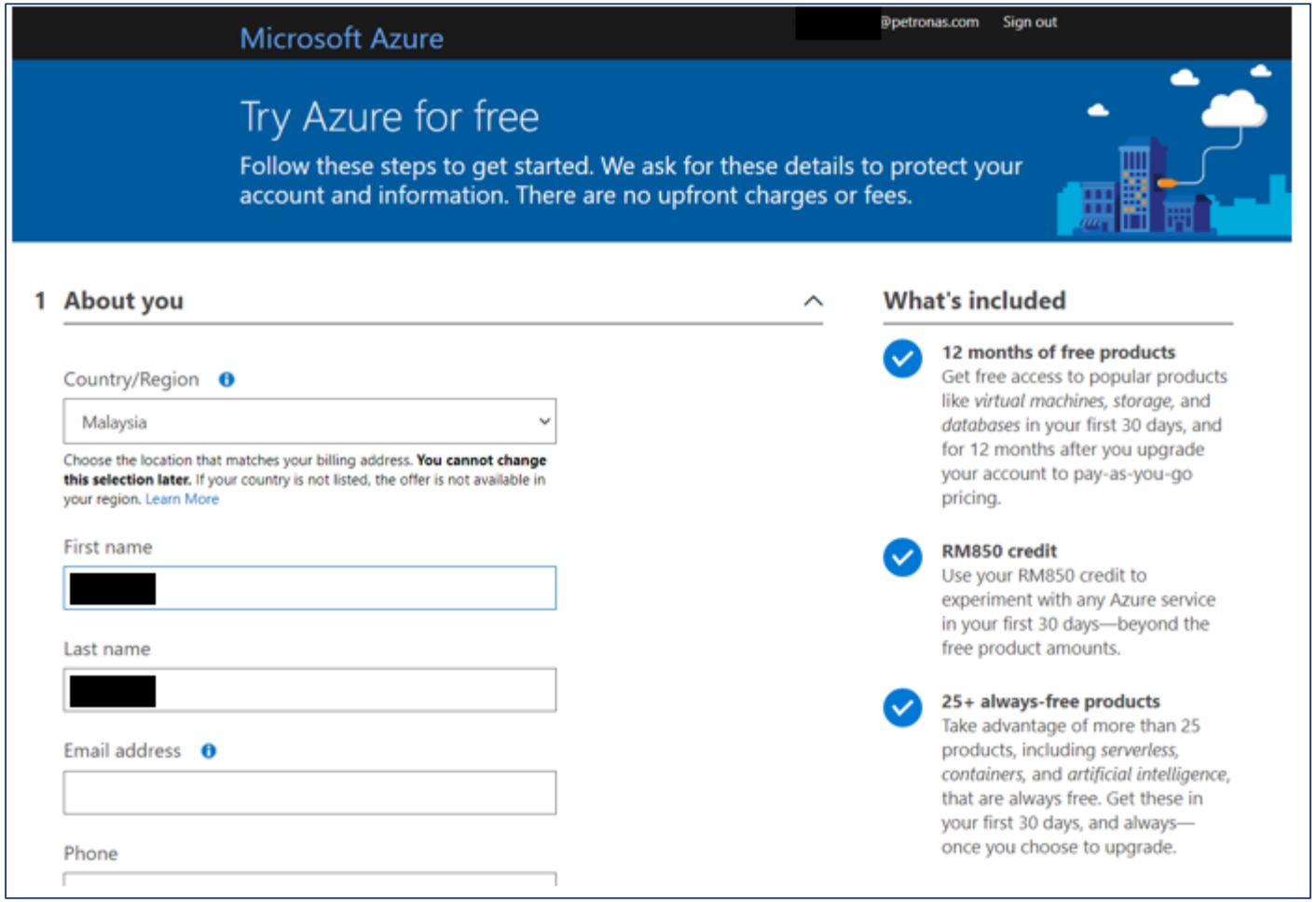
"**Sign in**" with newly created account





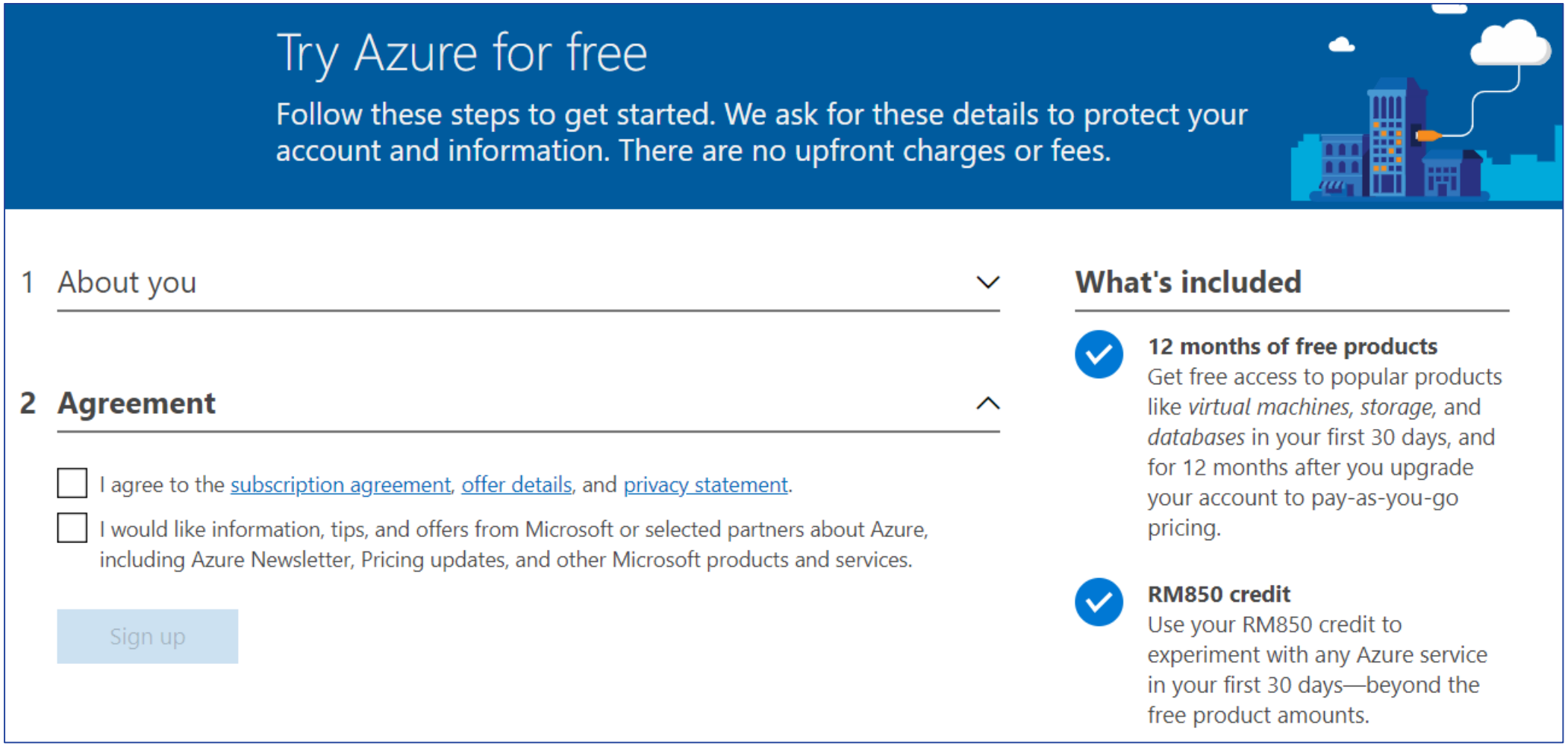
Azure Portal

Provide the below details



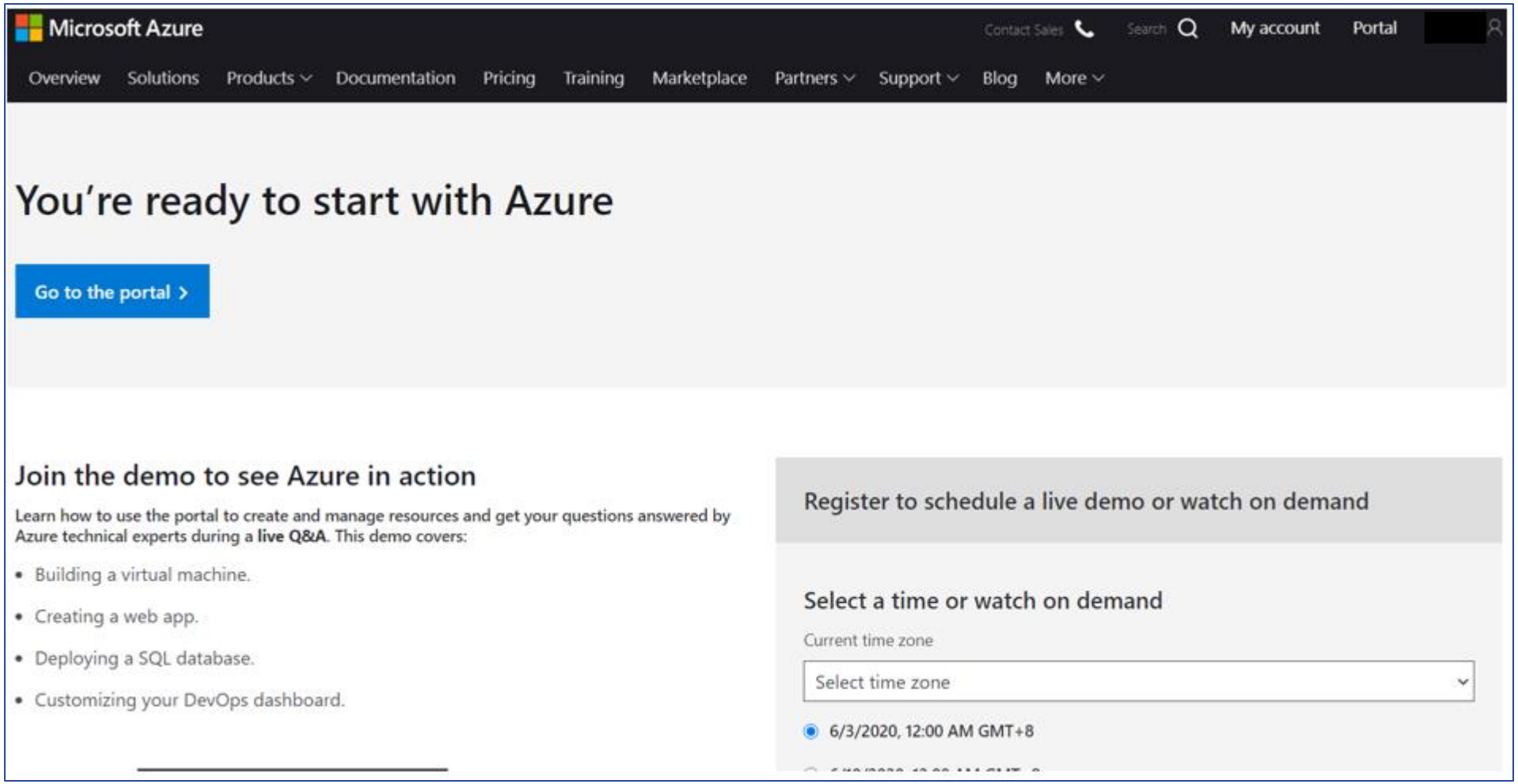
Azure Portal

Provide a confirmation for “**Agreement**”



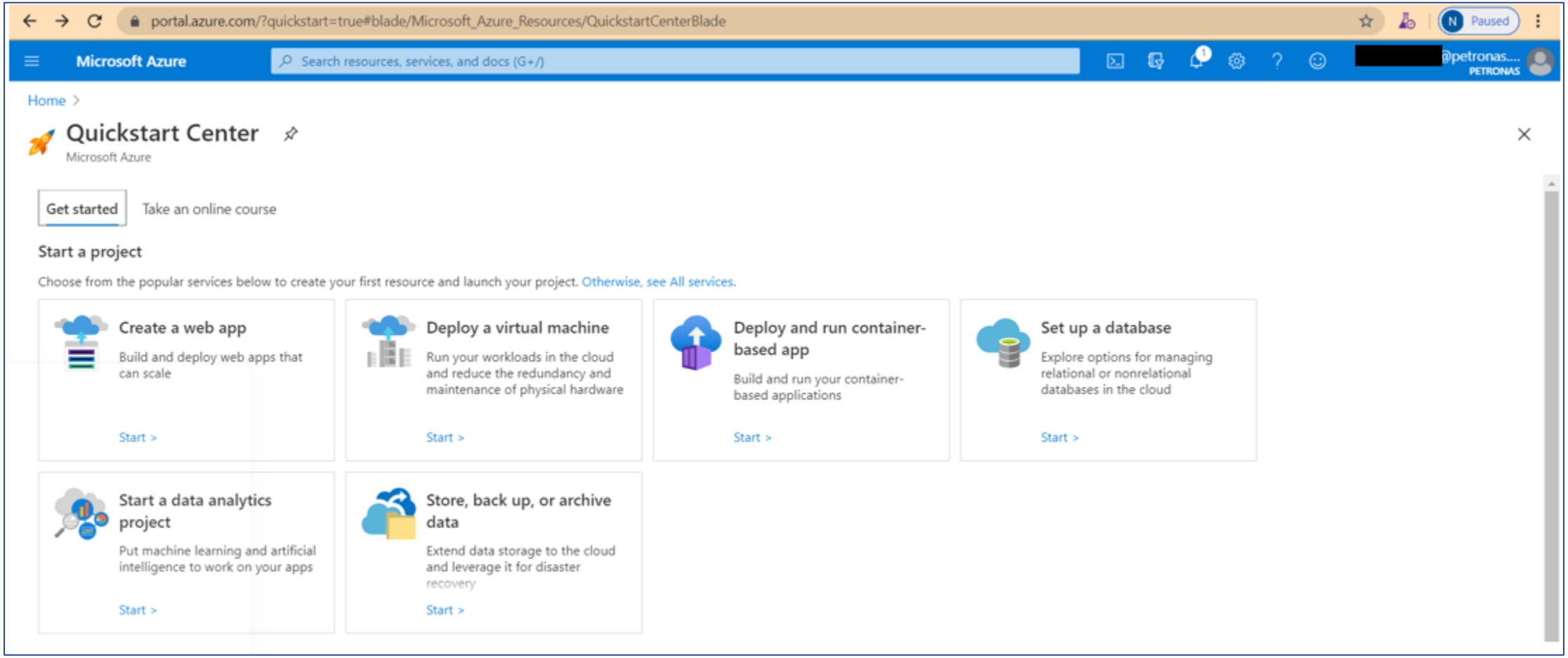
Azure Portal

All set. Click on “**Go to the portal**”



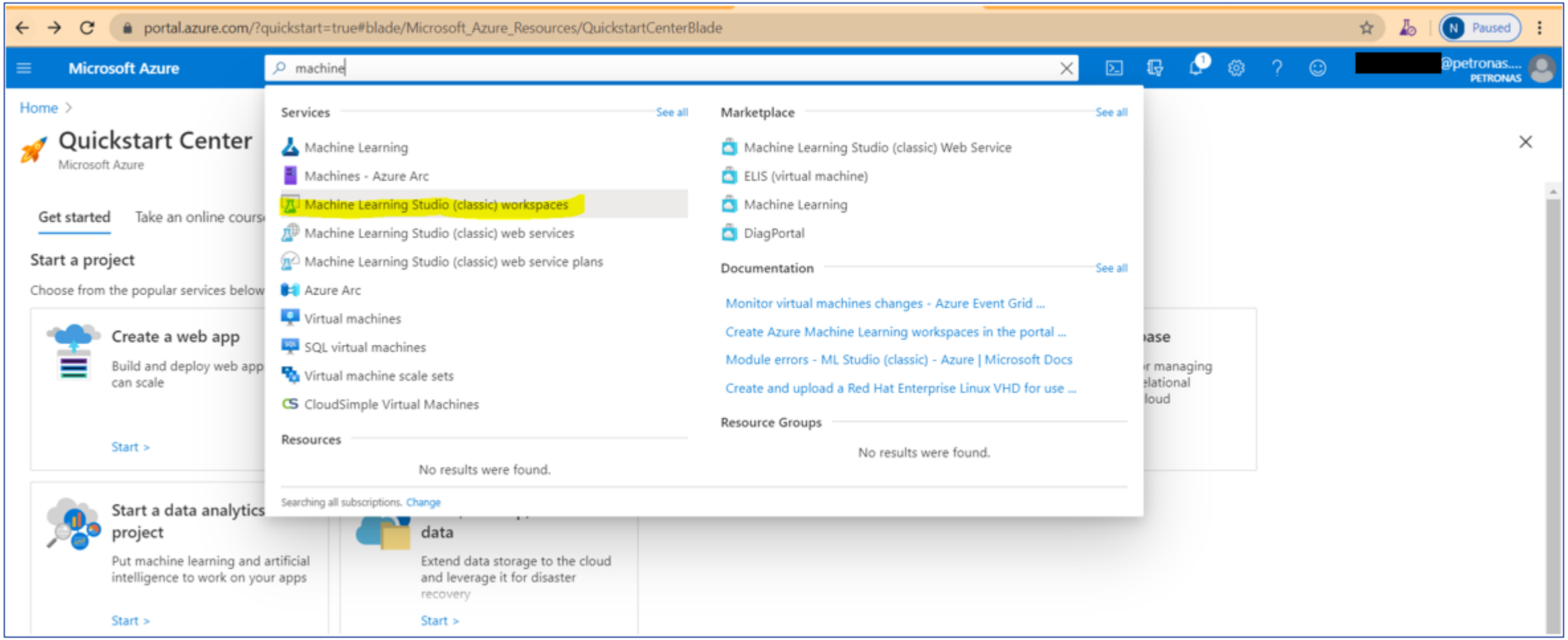
Azure Portal

Portal.Azure.com will open up



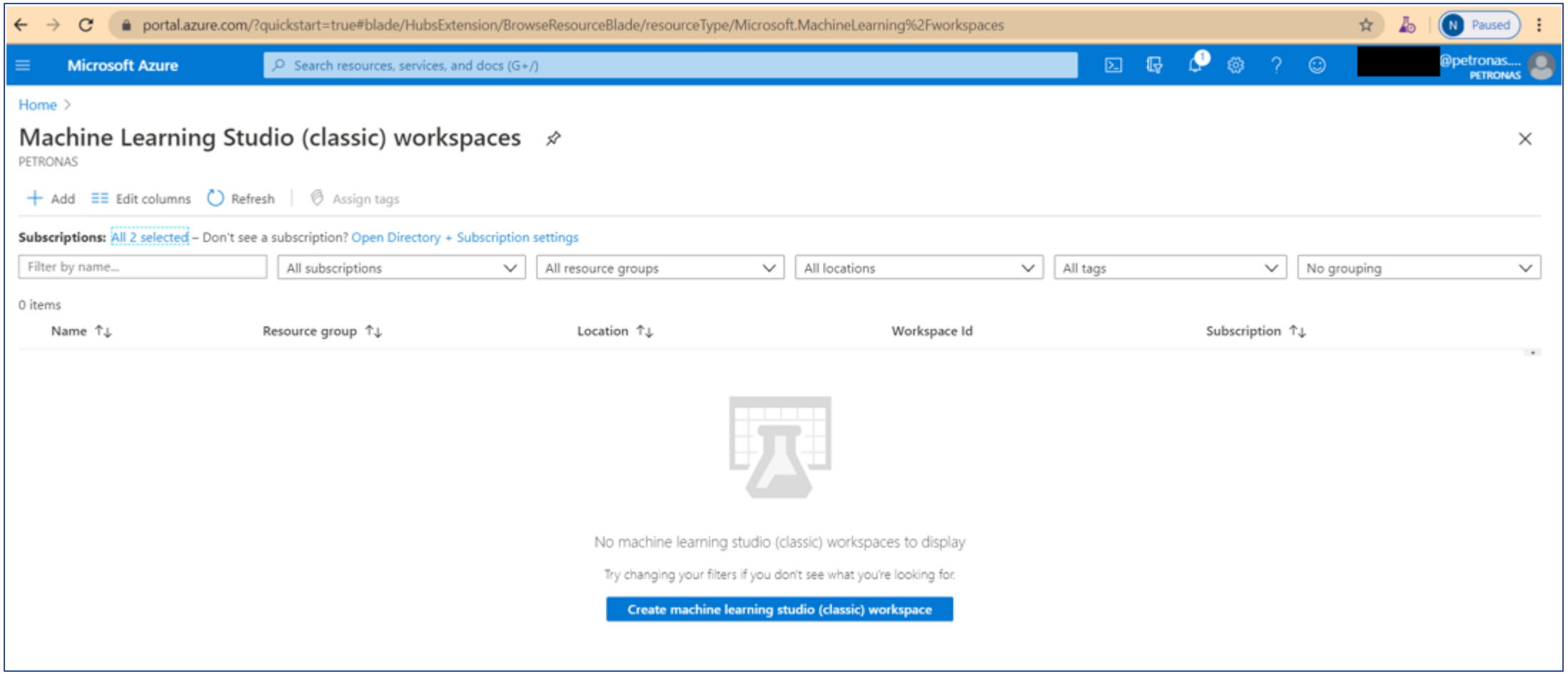
Azure ML Studio (Classic) - Workspace

Search for “**Machine Learning studio (classic) workspaces**”



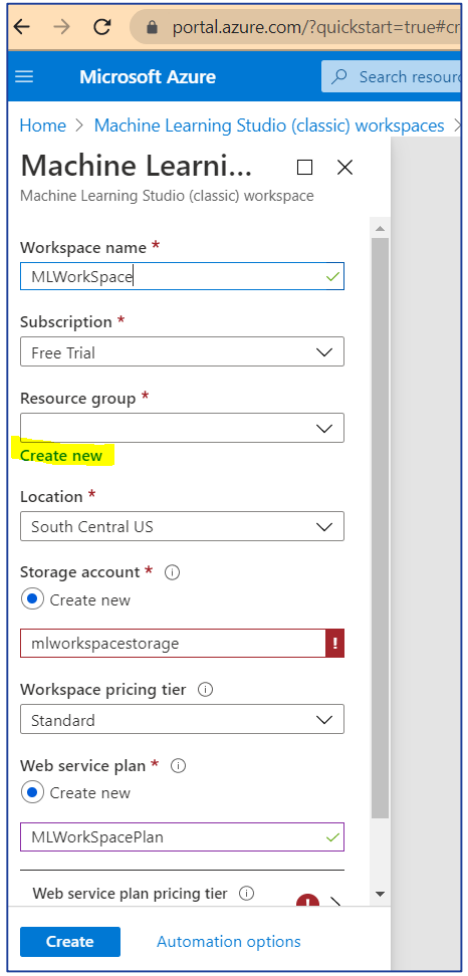
Azure ML Studio (Classic) - Workspace

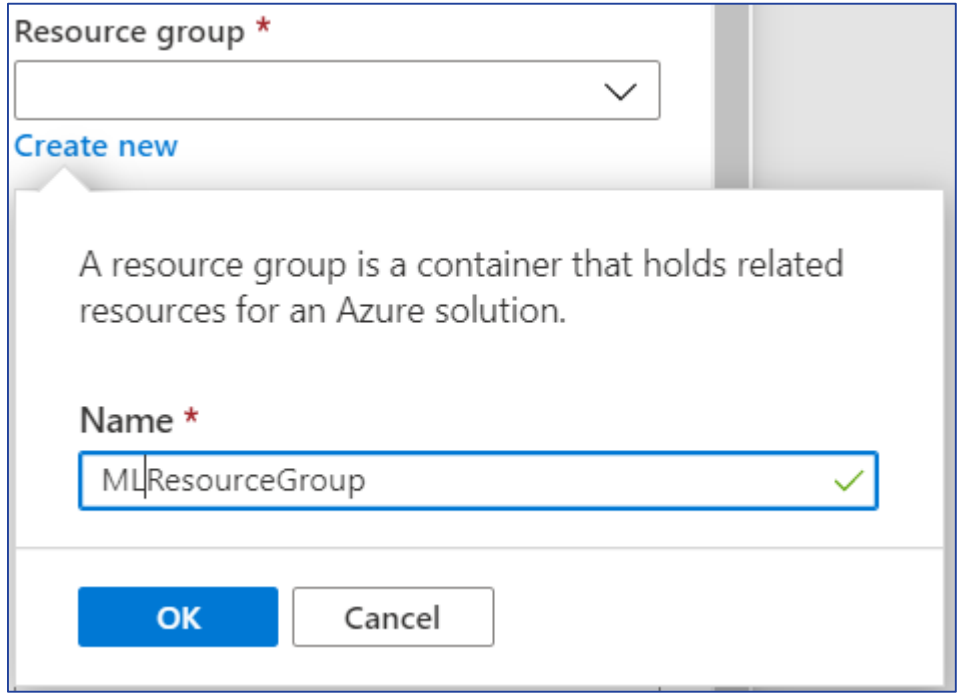
Click on “**Create machine learning studio (classic) workspace**”



Azure ML Studio (Classic) - Workspace

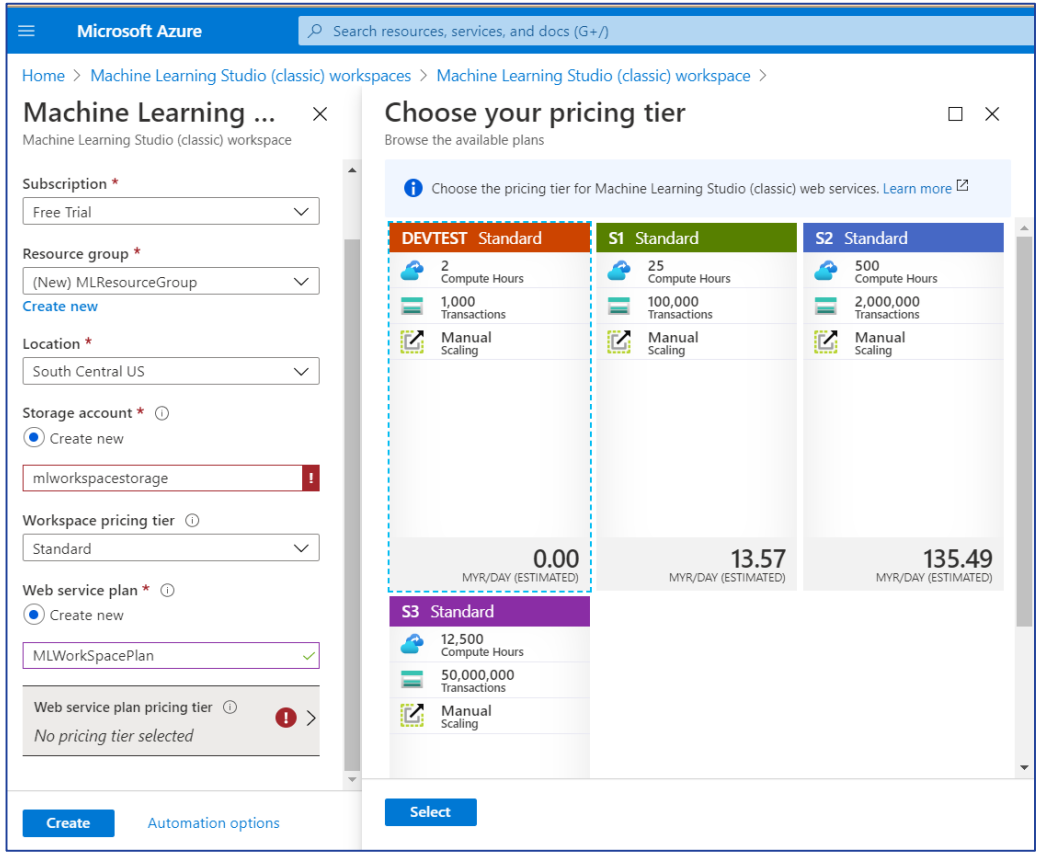
Resource Group creation

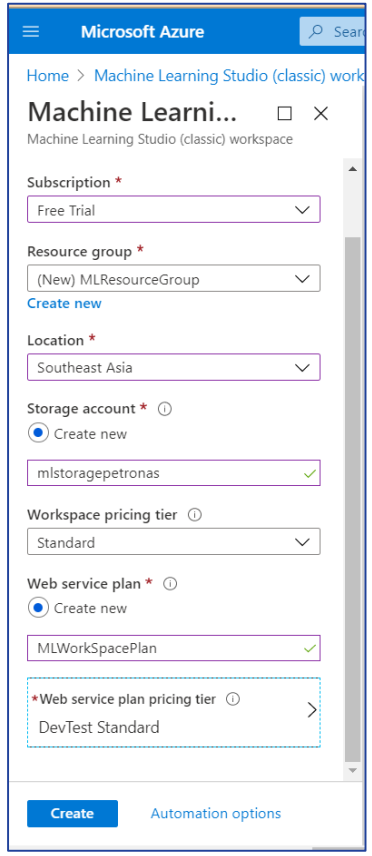




Azure ML Studio (Classic) - Workspace

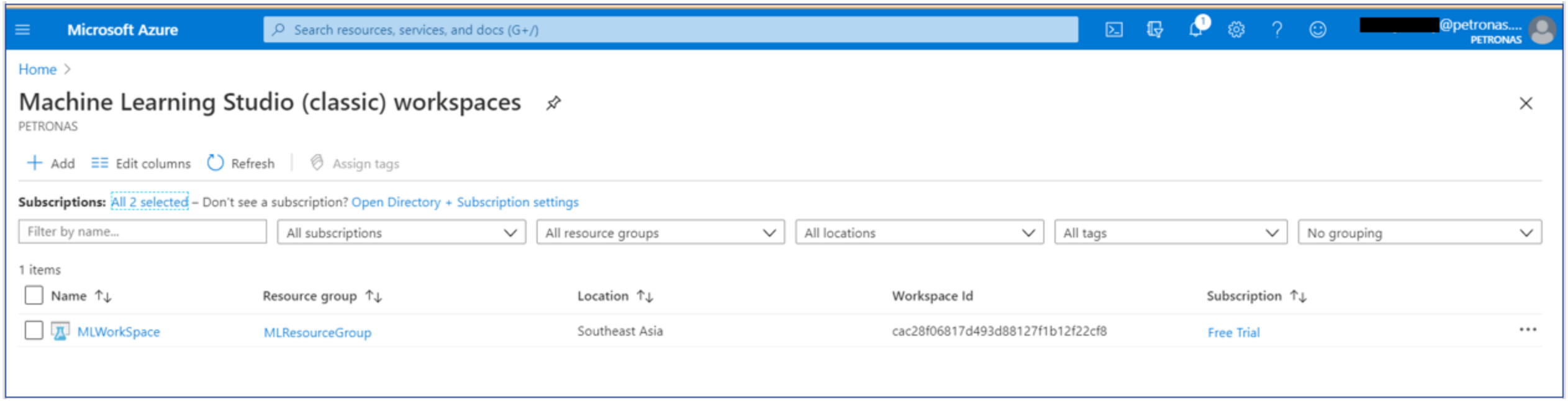
Choosing the pricing tier





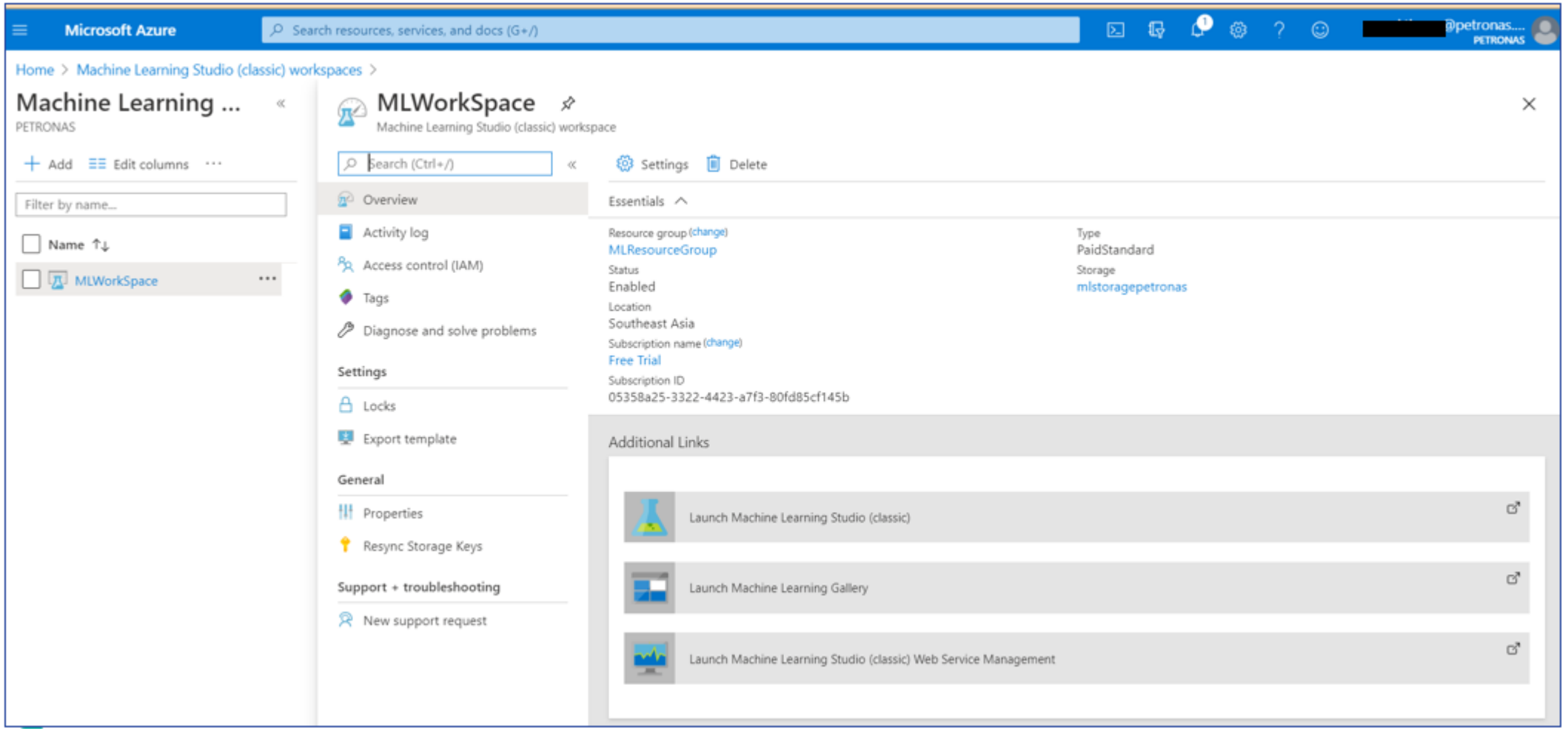
Azure ML Studio (Classic) - Workspace

Workspace has been created. Click on the workspace.



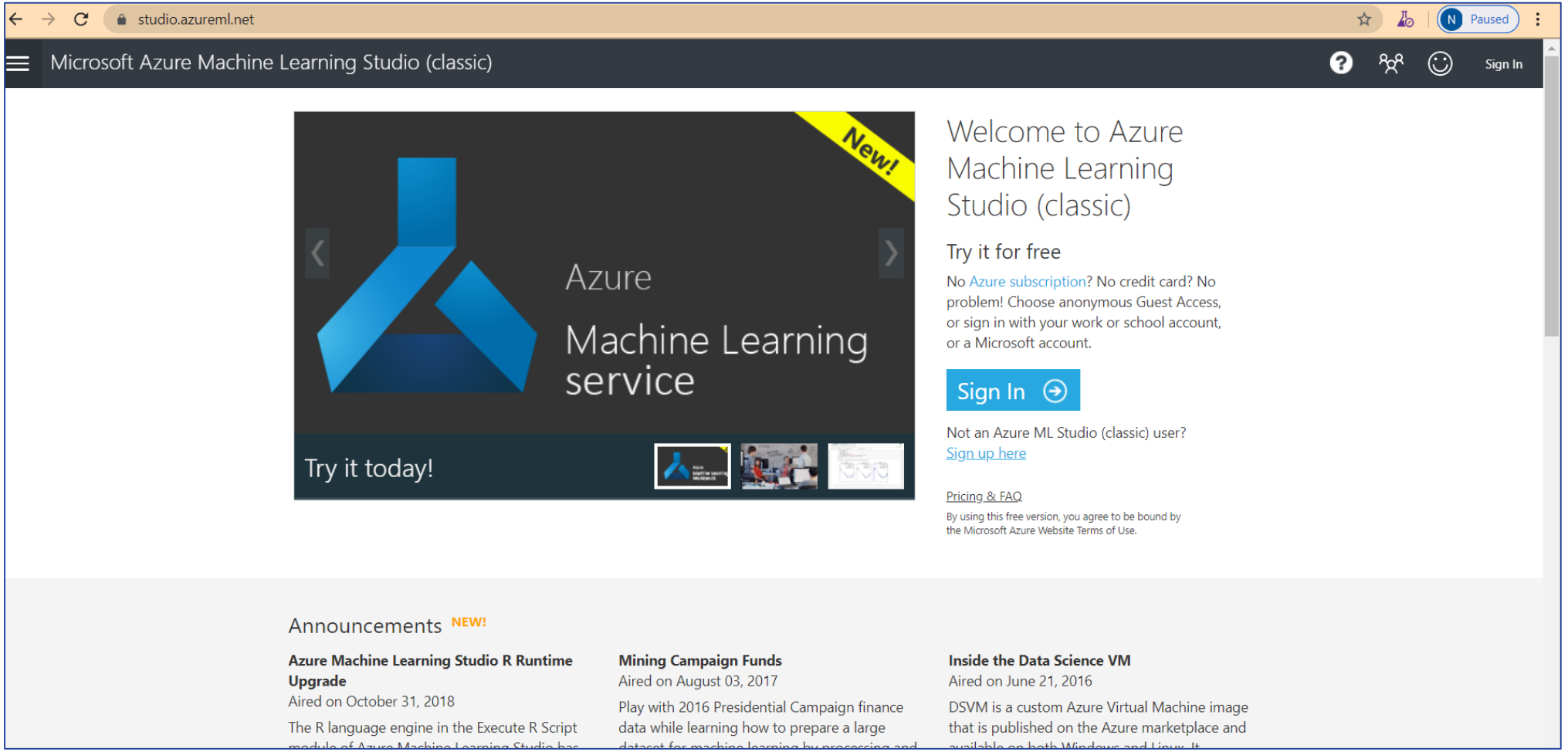
Azure ML Studio (Classic)

Click on “**Launch Machine Learning Studio (Classic)**”



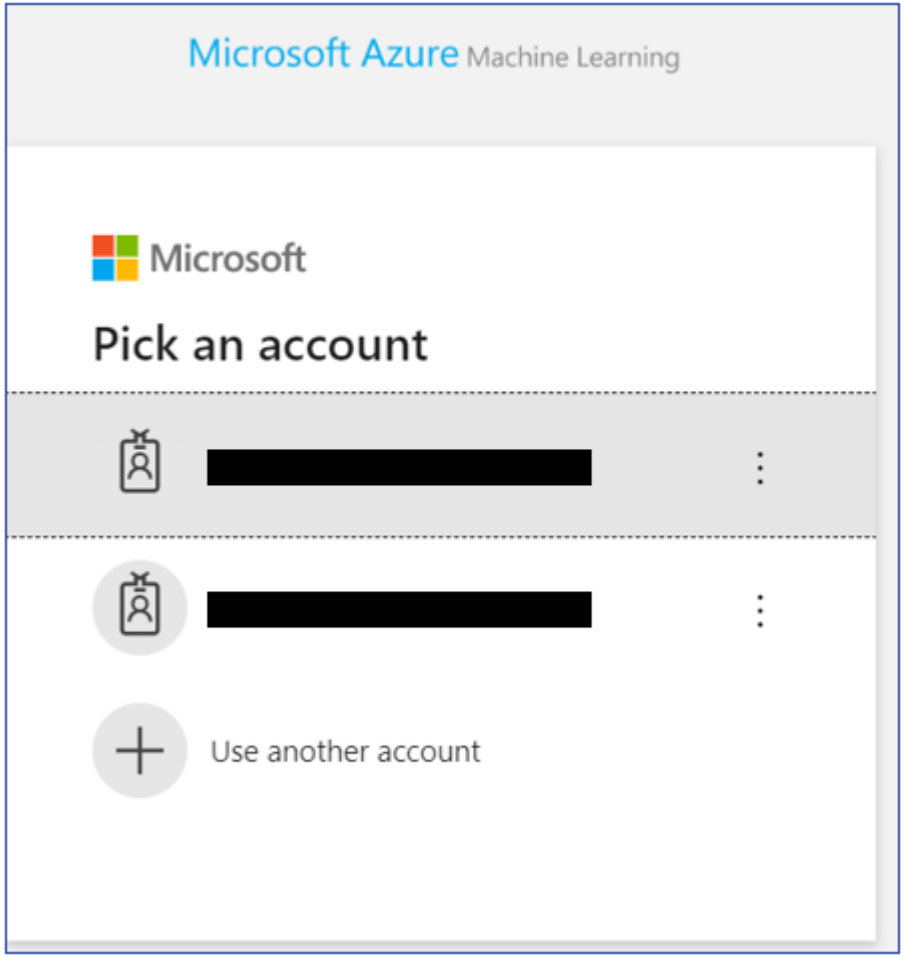
Azure ML Studio (Classic)

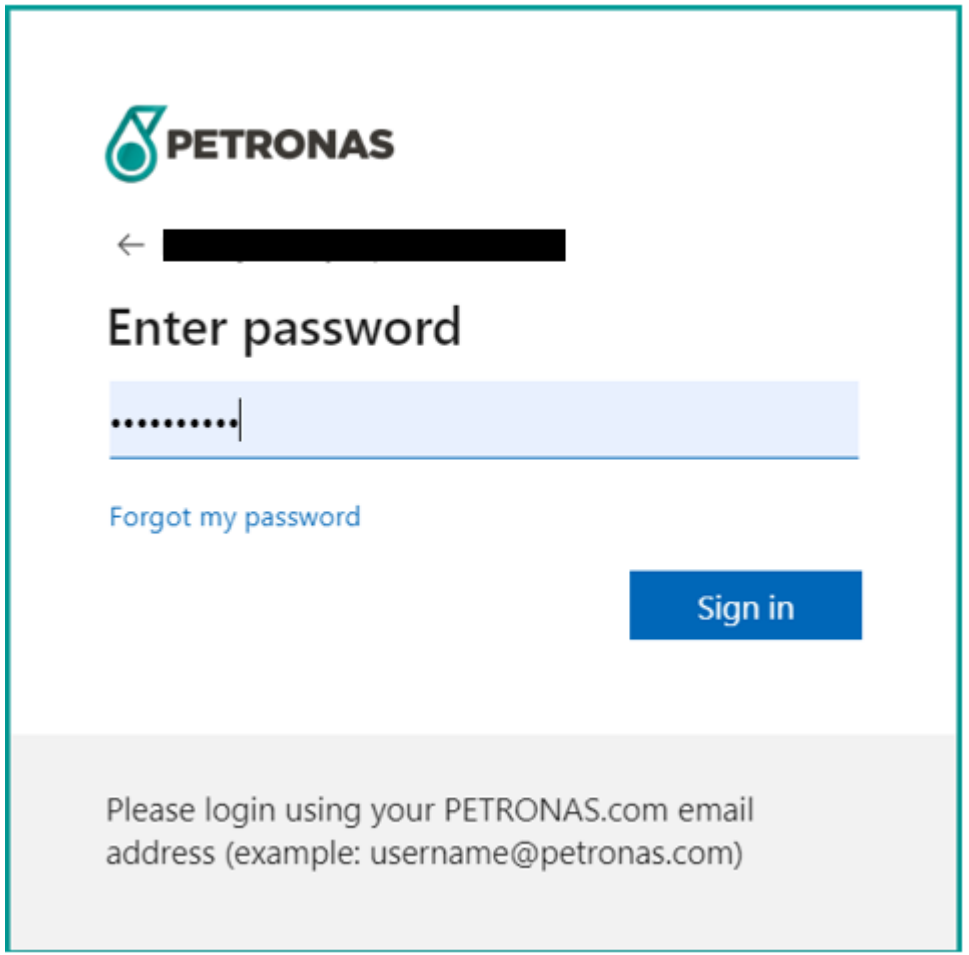
Click on “**Sign In**”



Azure ML Studio (Classic)

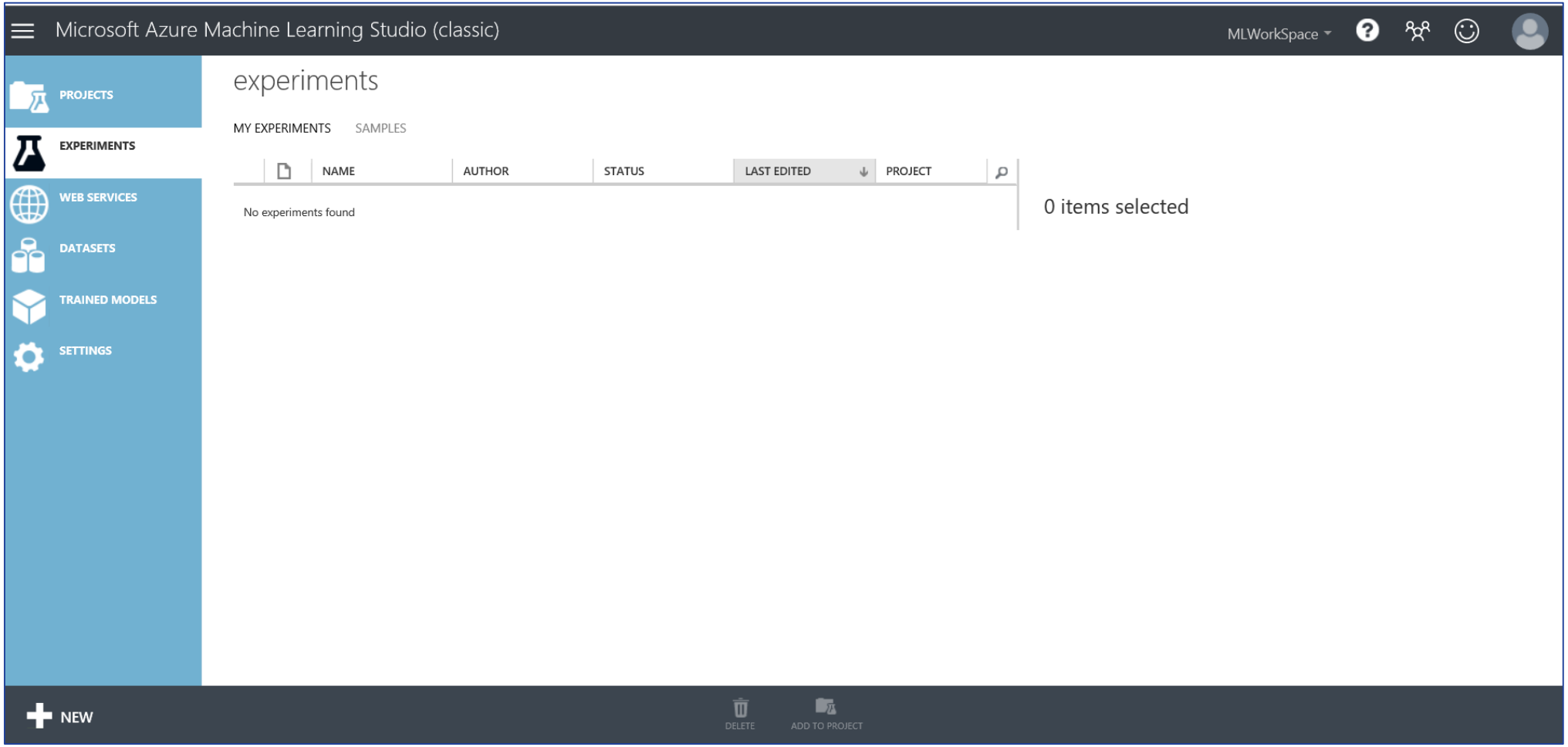
Provide your authentication





Azure ML Studio (Classic)

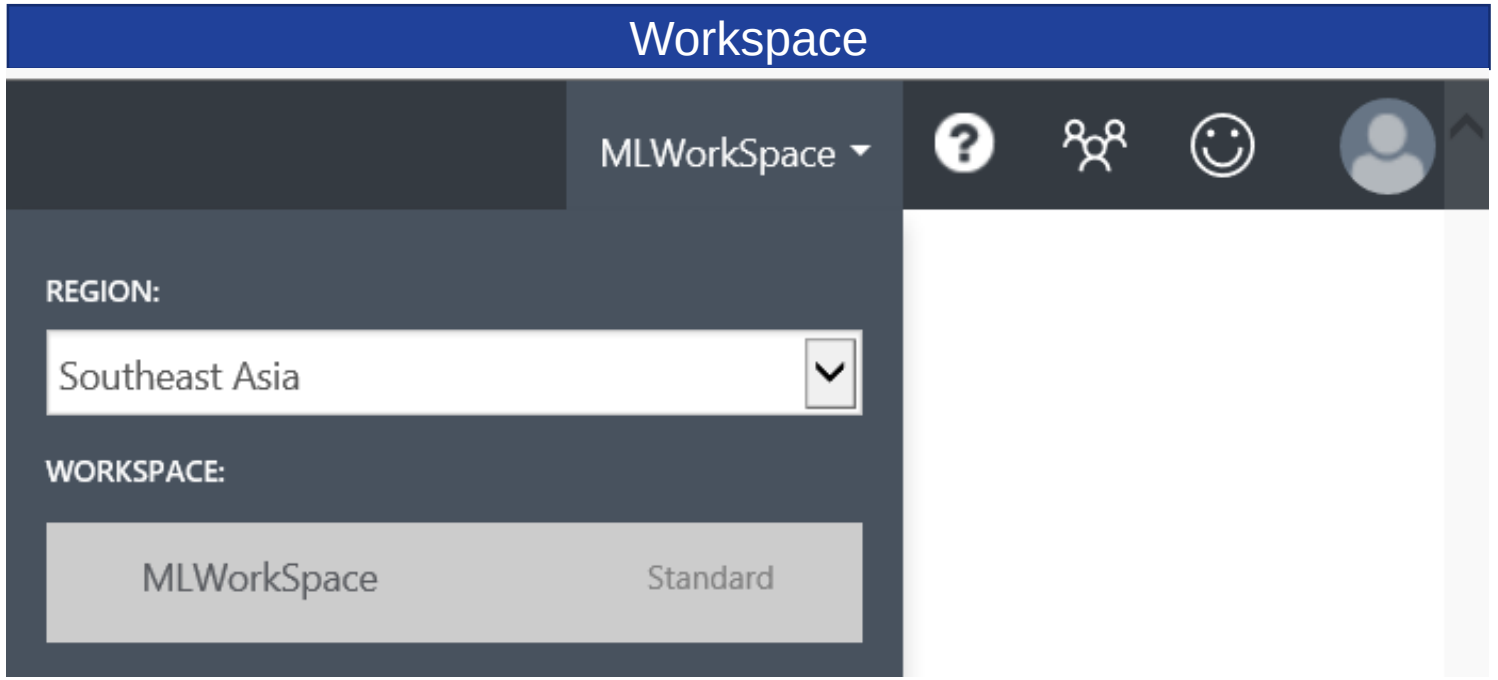
Azure ML Studio – Classic version



Components

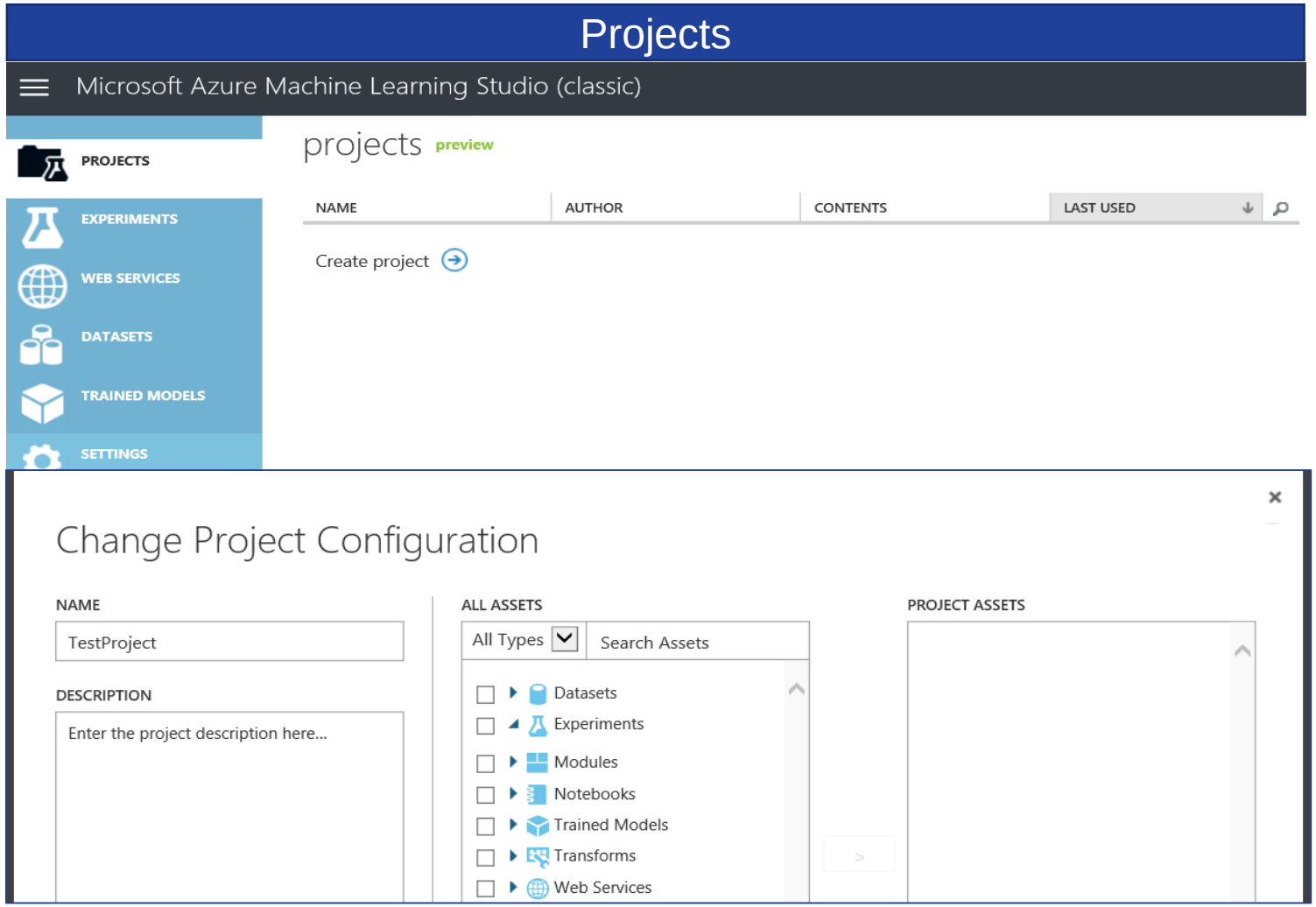
Azure ML Studio - Workspace

- This area consists of all the workspaces available against the user logins.
- A workspace is associated with certain region:
    - Southeast Asia
    - South Central US
    - West Europe
    - Japan East
    - West Central US
    - Central US EUAP



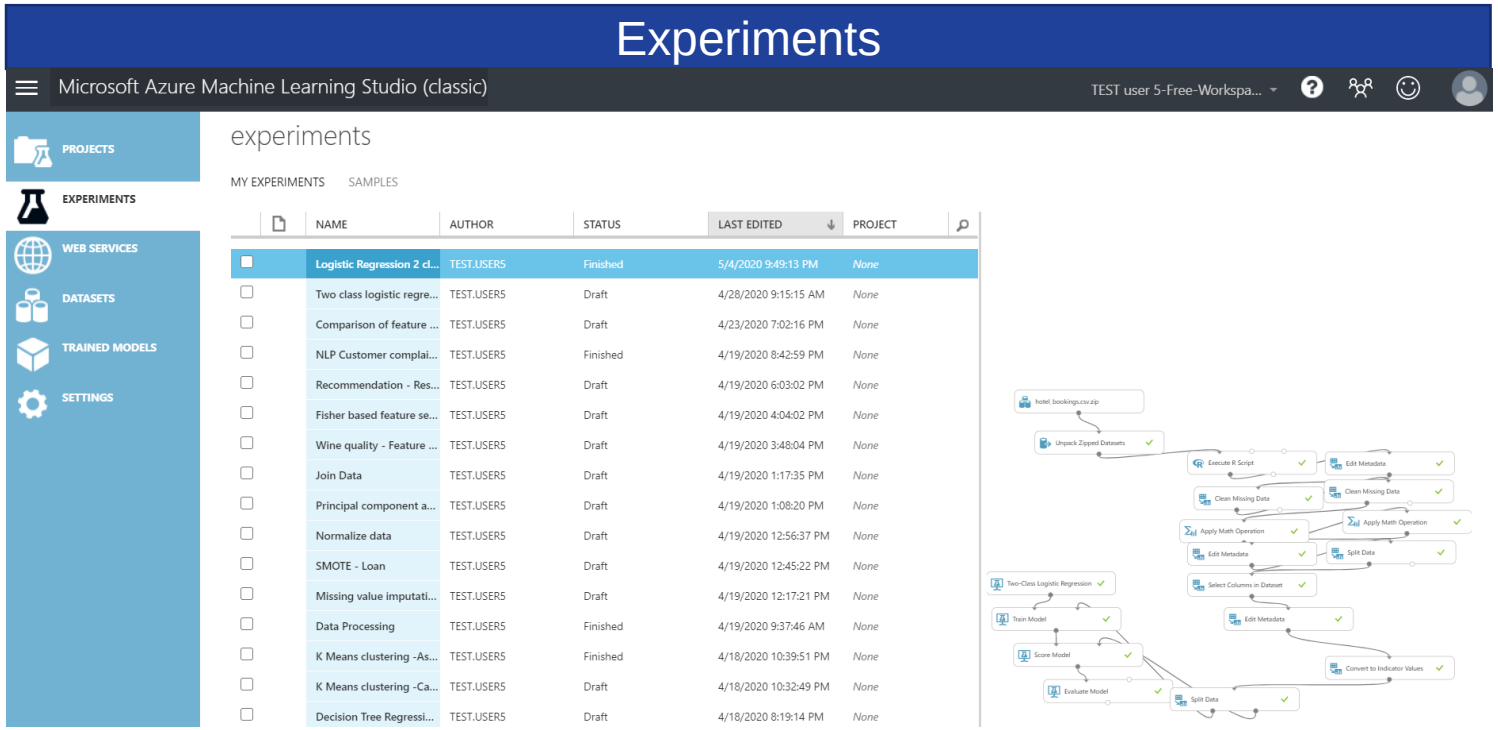
Azure ML Studio - Projects

- This area consists of all the projects available against the user logins.
- A project is a collection of scripts, notebooks, and/or data designed to support the everyday work of data scientists.
- Inside the project, one can have the related datasets, experiments and other artefacts.



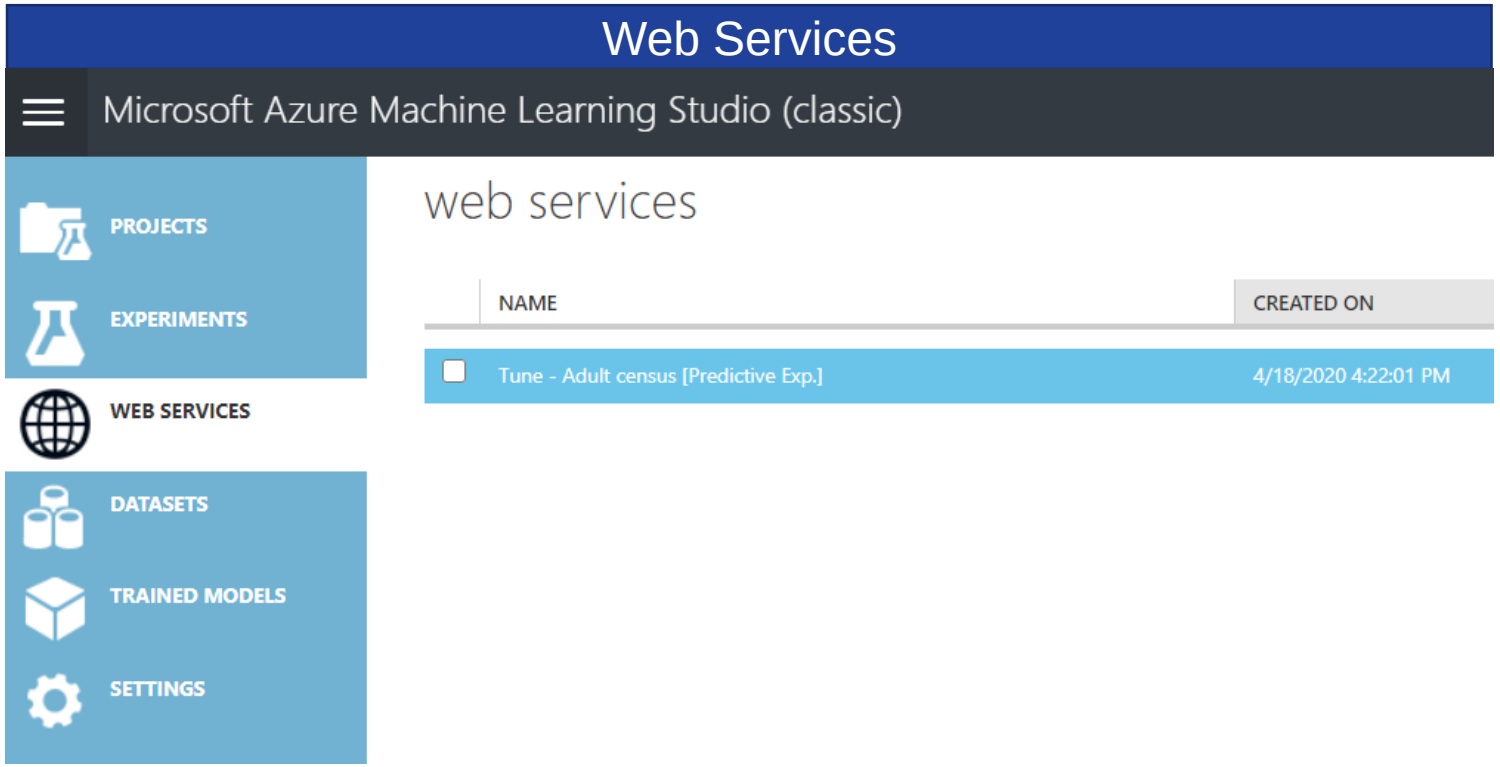
Azure ML Studio - Experiments

- This area consists of all the experiments available against the user logins in a project.
- "**Experiment**" is the name that **ML studio** uses to identify a visual workflow.



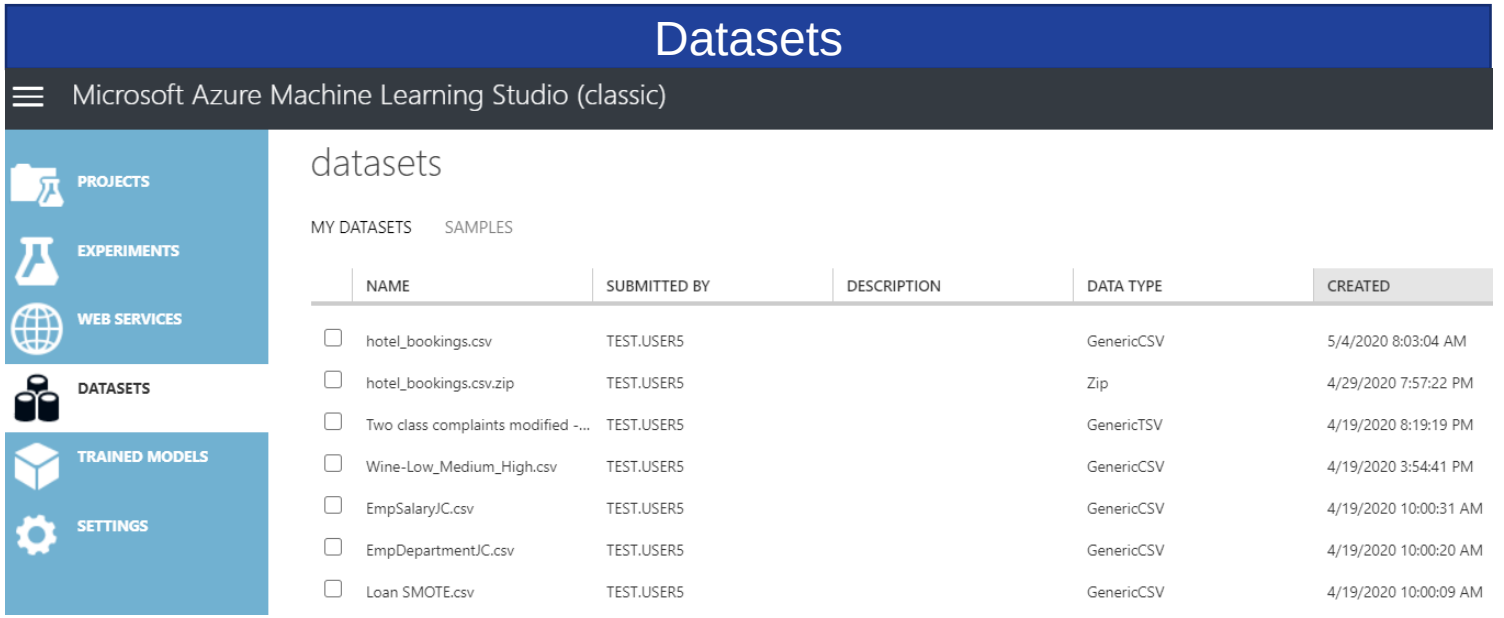
Azure ML Studio – Web Services

- This area consists of all the deployed experiments available against the user logins in a project.
- "**Web Services**" are the REST API calls that can be called from any application.



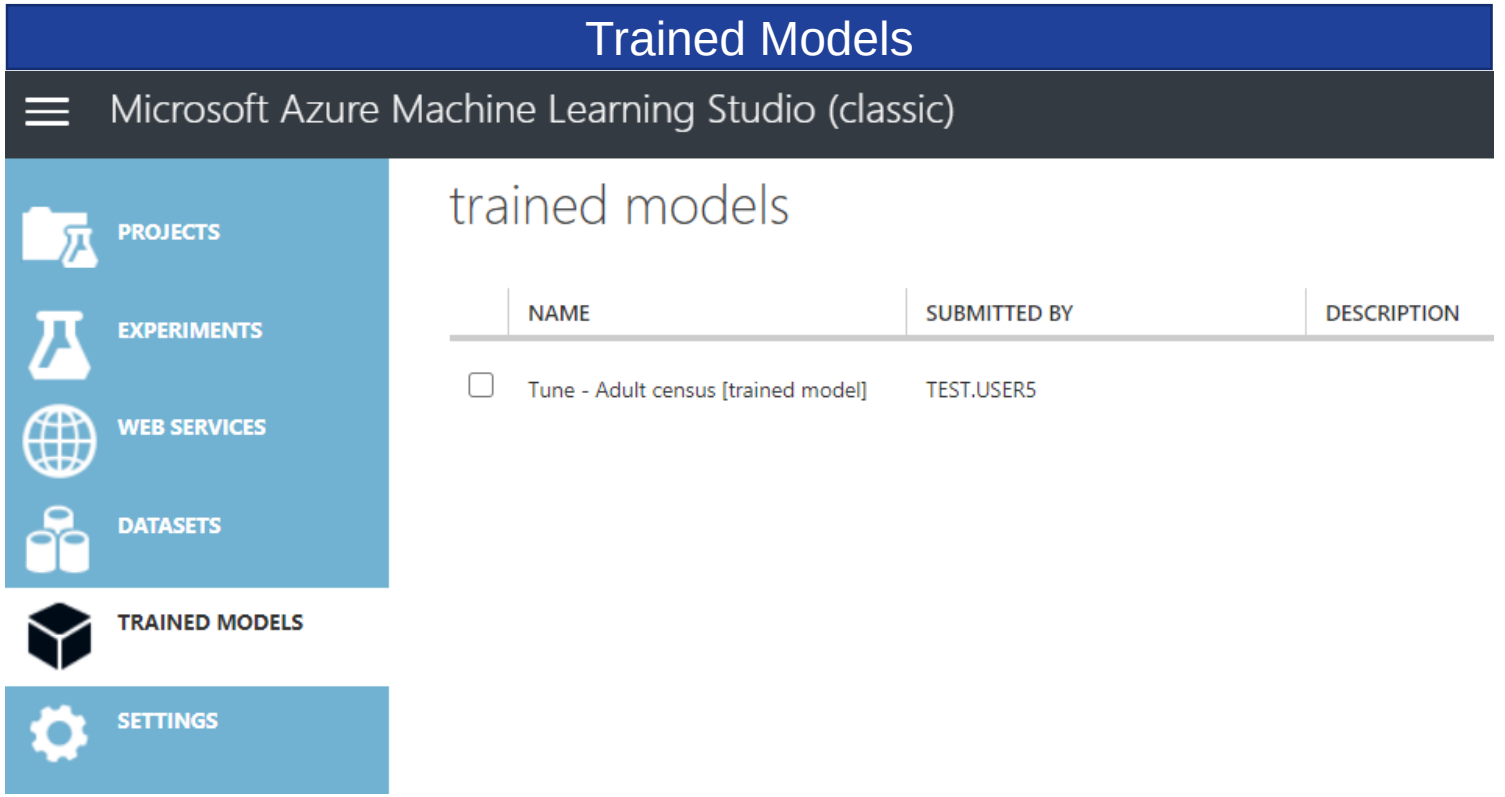
Azure ML Studio - Datasets

- This area consists of all the datasets available against the user logins in a project.



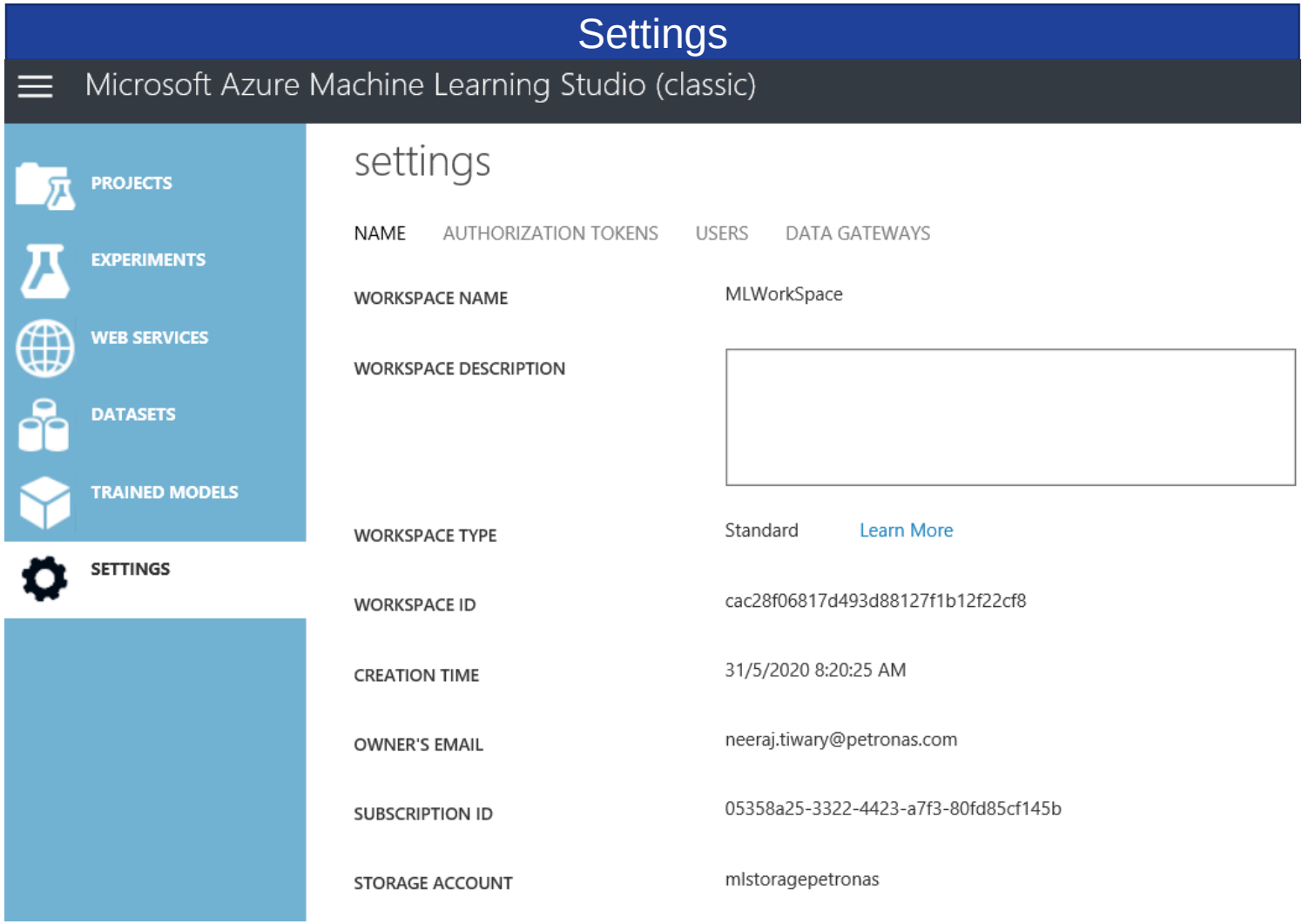
Azure ML Studio – Trained Models

- This area consists of all the trained models available against the user logins in a project.



Azure ML Studio – Settings

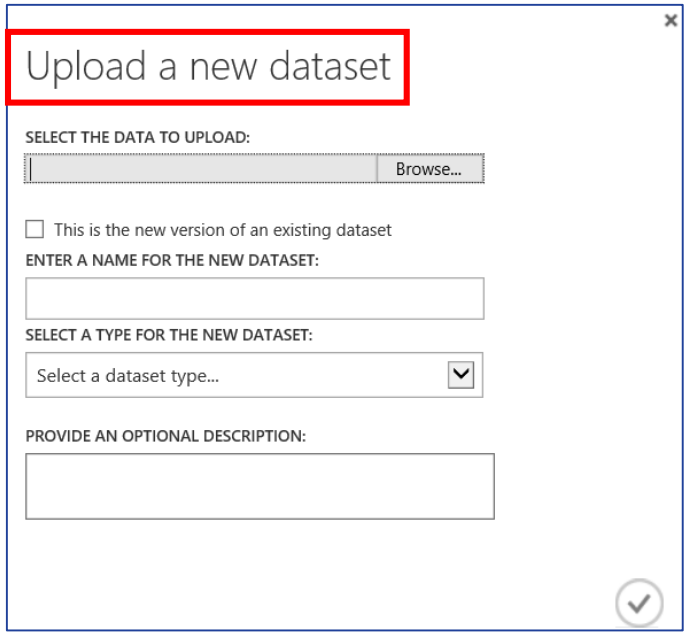
- This area consists of settings related to user login.

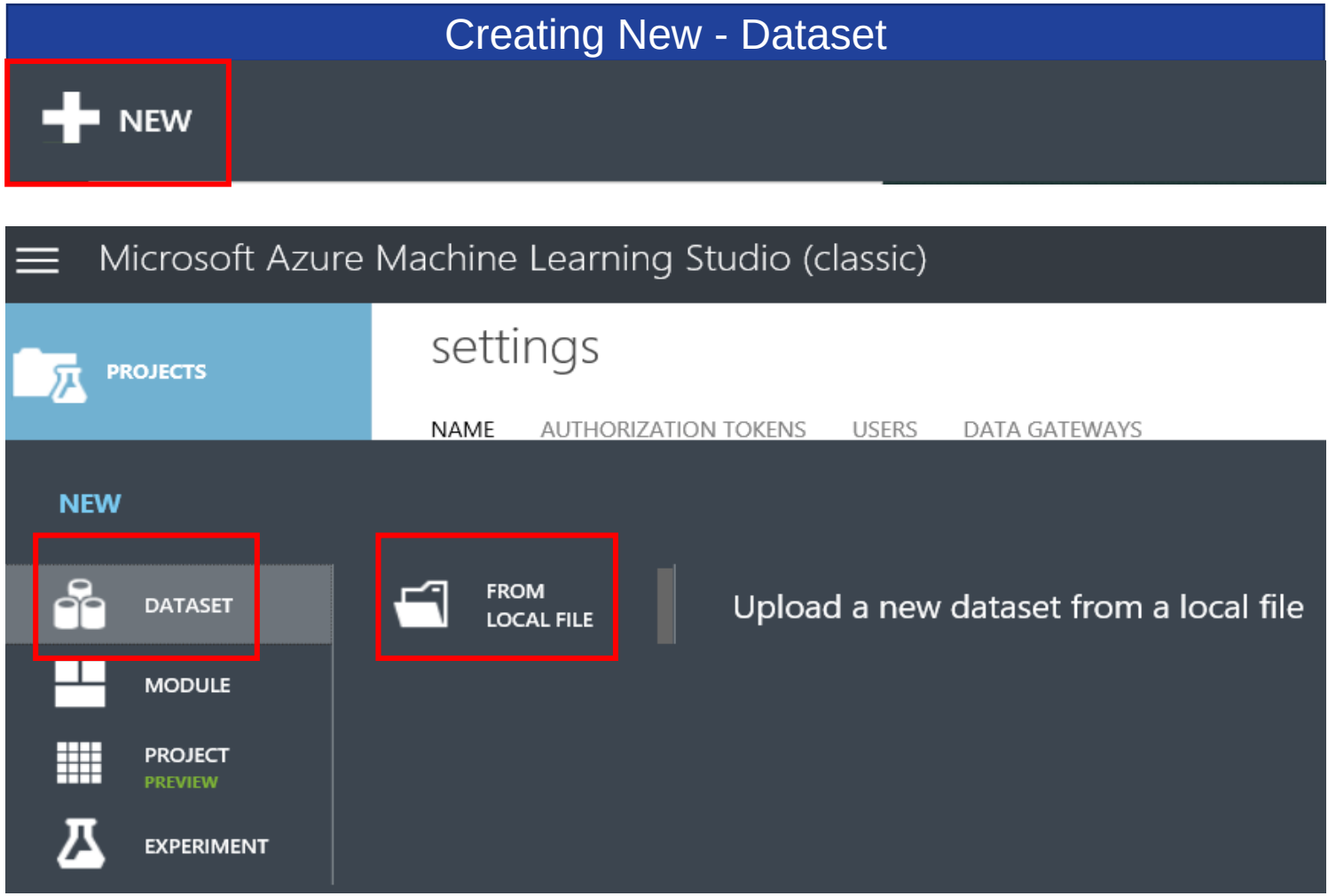


Azure ML Studio – Create new Datasets

- This area consists of creating new datasets:

  1. Click on the (+) sign
  2. Click on “**DATASET**”
  3. Click on **“FROM LOCAL FILE”**
  4. “**Upload a new dataset**”

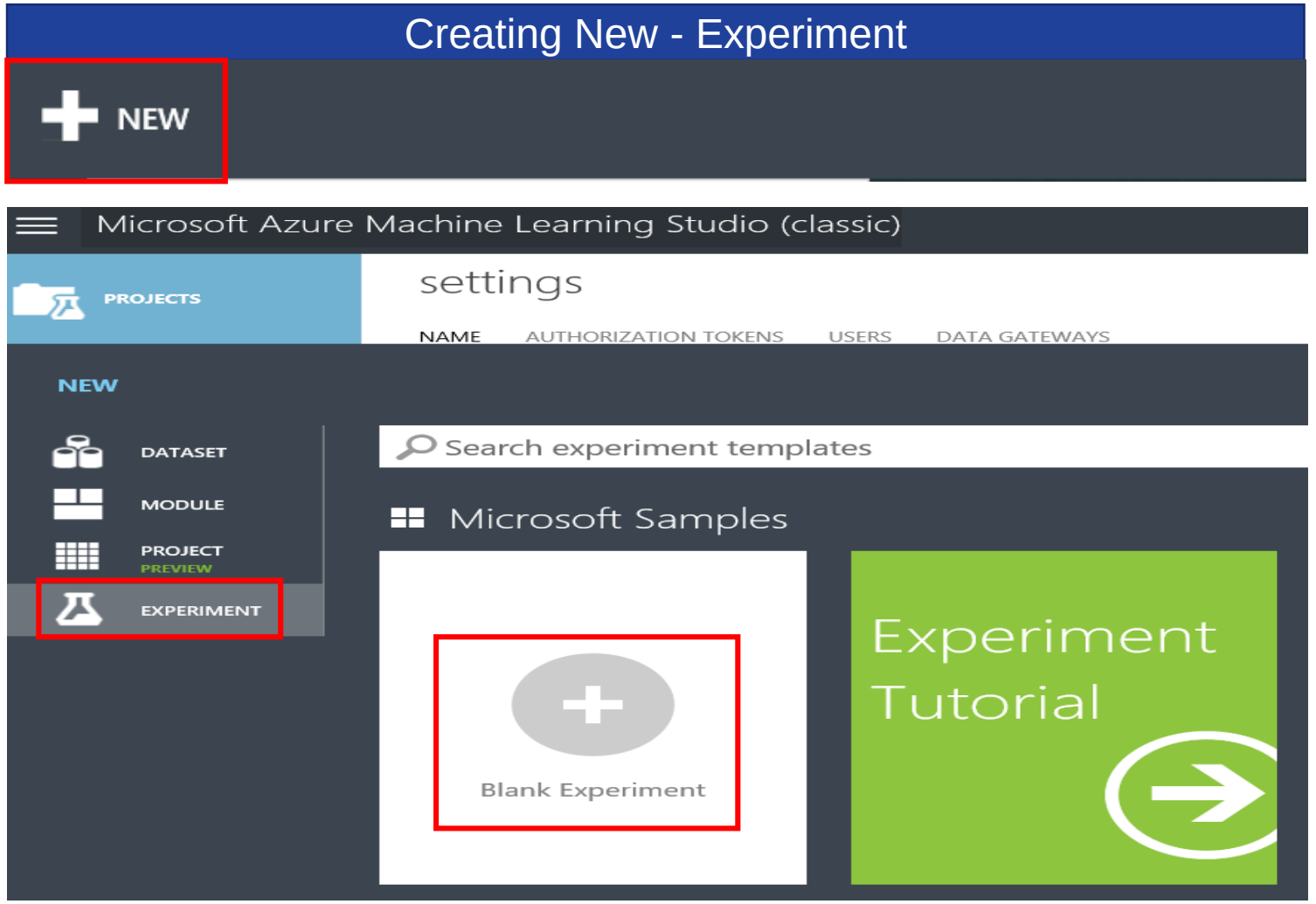




Azure ML Studio – Create new Experiments

- This area consists of creating new experiments

  1. Click on the (+) sign
  2. Go to “**Experiment**”
  3. Click on “**Blank Experiment**”



Summary and References

Summary

1. Azure ML is an auto ML Framework to develop experiments through drag and drop modules. Its quite easy, and intuitive for any novice person to develop any kind of visual workflows.

2. The deployed model can be accessed via REST APIs through any kind of applications like Power BI or Excel.

3. This is for all kind of users i.e. Citizen Data Scientists, or a person with just having a novice idea of machine learning.

References

Getting Started with Machine Learning Using Microsoft Azure ML Studio	https://www.codemag.com/article/1709071/Getting-Started-with-Machine-Learning-Using-Microsoft-Azure-ML-Studio
Documentation: Azure Machine Learning vs Machine Learning Studio (classic)	https://docs.microsoft.com/en-us/azure/machine-learning/compare-azure-ml-to-studio-classic
Documentation: Machine Learning Studio (classic)	https://docs.microsoft.com/en-us/azure/machine-learning/studio/what-is-ml-studio
Documentation: Machine learning products at Microsoft	https://docs.microsoft.com/en-us/azure/architecture/data-guide/technology-choices/data-science-and-machine-learning?context=azure/machine-learning/studio/context/ml-context

Thank you for your passion!