Introduction to Azure Machine Learning service: Run experiment

In this example, you'll learn how to use Azure Machine Learning for experimentation.

First, let's load your workspace and create an experiment. When you run *ws = Workspace.from_config()* below, you will be prompted to log in to your Azure subscription.. Once you are connected to your workspace in Azure cloud, you can start experimenting.

The workspace is an Azure resource that contains your experiments, models, deployments and remote compute resources, and the experiment is a container that you use to track and organize your runs.

In [1]:

```python
from azureml.core import Workspace, Experiment, Run
import math, random, pickle
```

In [2]:

```python
ws = Workspace.from_config()
```

```
Performing interactive authentication. Please follow the instructions on t
he terminal.
To sign in, use a web browser to open the page https://microsoft.com/devic
elogin and enter the code GAGF6F7RA to authenticate.
Interactive authentication successfully completed.
```

In [3]:

```python
experiment = Experiment(workspace = ws, name = "my-first-experiment")
```

Next, let's start an experiment run. We use Monte Carlo simulation to estimate pi as a simple example. While the experiment is running, metrics about the accuracy of the estimate are logged into run history.

Let's also save the value as a file into run history. In the next notebook we'll use this file to create a web service that computes an area of a circle using our estimate.

In [4]:

```python
run = experiment.start_logging()

pi_counter = 0
n_iter = 100000

# Log total number of iterations
run.log("Number of iterations",n_iter)

for i in range(1,n_iter):
    # Monte Carlo step to update estimate
    x = random.random()
    y = random.random()
    if x*x + y*y < 1.0:
        pi_counter += 1
    pi_estimate = 4.0*pi_counter / i

    # Log convergence every 10000 iterations
    if i%10000==0:
        error = math.pi-pi_estimate
        run.log("Pi estimate",pi_estimate)
        run.log("Error",error)

# Log final results
run.log("Final estimate: ",pi_estimate)
run.log("Final error: ",math.pi-pi_estimate)

# Write file containing pi value into run history
with open("pi_estimate.txt","wb") as f:
    pickle.dump(str(pi_estimate),f)
run.upload_file(name = 'outputs/pi_estimate.txt', path_or_stream = './pi_estimate.txt')

# Complete tracking and get link to details
run.complete()
```

Once the run has completed, you can view a detailed report of the run from Azure Portal by simply calling "run" and following the link.

In [5]:

```python
run
```

Out[5]:

Experiment	Id	Type	Status	Details Page
my-first-experiment	65c530fa-75df-4b08-b307-802d2192c2ce		Running	Link to Azure Portal (https://mlworkspace.azur fb930a0d0aaa/resourceGroups/saritaresource ws/experiments/my-first-experiment/runs/65c5

Next, learn how to deploy a web service that computes the area of circle using your estimate using following Notebook:

Deploy web service (02.deploy-web-service.ipynb)