

GTSC2143 Machine Learning for Business Analytics

Tutorial 1 – Python Basics

Please write down your answers in this document and submit it at iSpace by the end of this tutorial.

Activity 1. Jupyter Notebook Experience

1. Launch Jupyter Notebook using one of these methods:

- a) Command line: Type `jupyter notebook`

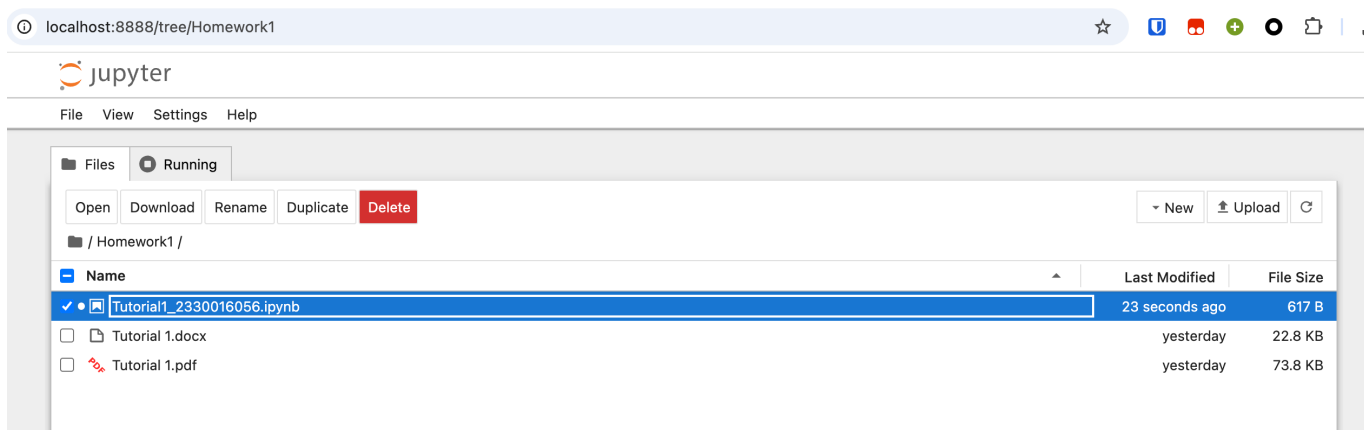
```
~ /Developments/GTSC2143-MLBus on P main +2
jupyter notebook
[I 2025-09-10 16:03:36.446 ServerApp] Package notebook took 0.0000s to import
[I 2025-09-10 16:03:36.467 ServerApp] Package jupyter_lsp took 0.0202s to import
[W 2025-09-10 16:03:36.467 ServerApp] A `_jupyter_server_extension_points` function was not found in jupyter_lsp. Instead, a `_jupyter_server_extension_paths` function was found and will be used for now. This function name will be deprecated in future releases of Jupyter Server.
[I 2025-09-10 16:03:36.474 ServerApp] Package jupyter_server_terminals took 0.0074s to import
[I 2025-09-10 16:03:36.475 ServerApp] Package jupyterlab took 0.0000s to import
[I 2025-09-10 16:03:36.989 ServerApp] Package notebook_shim took 0.0000s to import
[W 2025-09-10 16:03:36.990 ServerApp] A `_jupyter_server_extension_points` function was not found in notebook_shim. Instead, a `_jupyter_server_extension_paths` function was found and will be used for now. This function name will be deprecated in future releases of Jupyter Server.
[I 2025-09-10 16:03:37.634 ServerApp] Package panel.io.jupyter_server_extension took 0.6437s to import
[I 2025-09-10 16:03:37.634 ServerApp] jupyter_lsp | extension was successfully linked.
[I 2025-09-10 16:03:37.637 ServerApp] jupyter_server_terminals | extension was successfully linked.
[I 2025-09-10 16:03:37.639 ServerApp] jupyterlab | extension was successfully linked.
[I 2025-09-10 16:03:37.642 ServerApp] notebook | extension was successfully linked.
[I 2025-09-10 16:03:37.949 ServerApp] notebook_shim | extension was successfully linked.
[I 2025-09-10 16:03:37.949 ServerApp] panel.io.jupyter_server_extension | extension was successfully linked.
[I 2025-09-10 16:03:38.016 ServerApp] notebook_shim | extension was successfully loaded.
[I 2025-09-10 16:03:38.017 ServerApp] jupyter_lsp | extension was successfully loaded.
[I 2025-09-10 16:03:38.018 ServerApp] jupyter_server_terminals | extension was successfully loaded.
[I 2025-09-10 16:03:38.021 LabApp] JupyterLab extension loaded from /opt/homebrew/anaconda3/lib/python3.11/site-packages/jupyterlab
[I 2025-09-10 16:03:38.021 LabApp] JupyterLab application directory is /opt/homebrew/anaconda3/share/jupyter/lab
[I 2025-09-10 16:03:38.021 LabApp] Extension Manager is 'pypi'.
[I 2025-09-10 16:03:38.023 ServerApp] jupyterlab | extension was successfully loaded.
[I 2025-09-10 16:03:38.025 ServerApp] notebook | extension was successfully loaded.
[I 2025-09-10 16:03:38.025 ServerApp] panel.io.jupyter_server_extension | extension was successfully loaded.
[I 2025-09-10 16:03:38.026 ServerApp] Serving notebooks from local directory: /Users/tosaka/Developments/GTSC2143-MLBus
[I 2025-09-10 16:03:38.026 ServerApp] Jupyter Server 2.10.0 is running at:
[I 2025-09-10 16:03:38.026 ServerApp] http://localhost:8888/tree?token=9c6a3edc4faf44911bf18d017f9e4b7c25f040810f9bb96e
[I 2025-09-10 16:03:38.026 ServerApp] http://127.0.0.1:8888/tree?token=9c6a3edc4faf44911bf18d017f9e4b7c25f040810f9bb96e
[I 2025-09-10 16:03:38.026 ServerApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 2025-09-10 16:03:38.030 ServerApp]

To access the server, open this file in a browser:
file:///Users/tosaka/Library/Jupyter/runtime/jpserver-19917-open.html
Or copy and paste one of these URLs:
http://localhost:8888/tree?token=9c6a3edc4faf44911bf18d017f9e4b7c25f040810f9bb96e
http://127.0.0.1:8888/tree?token=9c6a3edc4faf44911bf18d017f9e4b7c25f040810f9bb96e
```

- b) Anaconda Navigator: Click the Jupyter Notebook icon

2. Create New Notebook

- a) Create a new notebook and name it: `Tutorial1_<your_student_id>`



3. Execute Python Exercises

- a) Complete Activity 2 exercises in separate Jupyter notebook cells

jupyter Tutorial1_2330016056 Last Checkpoint: 2 minutes ago

File Edit View Run Kernel Settings Help Trusted

JupyterLab Python 3 (ipykernel)

```
[7]: # 1.
# a)
name = "Bohan YANG"
id = "2330016056"

# b)
res = 15 ** 3

# c)
res = 114 / 514

# d)
a = 114
b = 514
c = str(a) + str(b)

[12]: # 2.
# a)
a = [10, 20, 30, 40, 50]

# b)
a.append(60)

# c)
res1 = a[:3]

# d)
res2 = a[-2:]

# e)
res3 = a[-2]
```

jupyter Tutorial1_2330016056 Last Checkpoint: 2 minutes ago

File Edit View Run Kernel Settings Help Trusted

JupyterLab Python 3 (ipykernel)

```
[18]: # 3.
# a)
student_info = {"name": name, "student_id": id}

# b)
student_info["major"] = "Computer Science and Technology"

# c)
has_gender = "gender" in student_info

# d)
del student_info["major"]

# e)
for key, value in student_info.items():
    print(key, ":", value)

# f)
student_info2 = {"name": "test", "student_id": 1234}

print("Has gender key:", has_gender)
print("Second dictionary:", student_info2)

name : Bohan YANG
student_id : 2330016056
Has gender key: False
Second dictionary: {'name': 'test', 'student_id': 1234}

[19]: # 4.
# a)
import pandas as pd

# b)
df = pd.DataFrame([student_info, student_info2])

# c)
df.to_csv("student_info.csv", index=False)
```

Activity 2. Python Basic Exercise

1. Basic Data Types and Operations

- Create variables to store your name and student ID
- Calculate 15 to the power of 3
- Divide two integers to get a float result

d) Convert numbers to strings and perform string concatenation

```
# 1.  
# a)  
name = "Bohan YANG"  
id = "2330016056"  
  
# b)  
res = 15 ** 3  
  
# c)  
res = 114 / 514  
  
# d)  
a = 114  
b = 514  
c = str(a) + str(b)
```

2. List Operations

- a) Create a list containing 5 numbers
- b) Append a new element to the end of the list
- c) Get the first 3 elements of the list
- d) Get the last 2 elements of the list
- e) Access the second-to-last element using negative indexing

```
# 2.  
# a)  
a = [10, 20, 30, 40, 50]  
  
# b)  
a.append(60)  
  
# c)  
res1 = a[:3]  
  
# d)  
res2 = a[-2:]  
  
# e)  
res3 = a[-2]
```

3. Dictionary Operations

- a) Create a student information dictionary containing your name and student ID
- b) Add a new key-value pair to include your major information

- c) Check if a certain key ("gender") exists in the dictionary
- d) Delete the key-value pair (major information) from the dictionary
- e) Iterate through all key-value pairs in the dictionary
- f) Create another student information dictionary with name: "test" and student ID: 1234

```
# 3.
# a)
student_info = {"name": name, "student_id": id}

# b)
student_info["major"] = "Computer Science and Technology"

# c)
has_gender = "gender" in student_info

# d)
del student_info["major"]

# e)
for key, value in student_info.items():
    print(key, ":", value)

# f)
student_info2 = {"name": "test", "student_id": 1234}

print("Has gender key:", has_gender)
print("Second dictionary:", student_info2)
```

4. Package Import and Usage

- a) Import Pandas
- b) Create a DataFrame from the two student information dictionary
- c) Export the DataFrame to a CSV file

```
# 4.
# a)
import pandas as pd

# b)
df = pd.DataFrame([student_info, student_info2])

# c)
df.to_csv("student_info.csv", index=False)
```

Delimiter: ,

	name	student_id
1	Bohan YANG	2330016056
2	test	1234

- End of Tutorial 1 -