MIS710 Machine Learning in Business
Week 0 - Introduction

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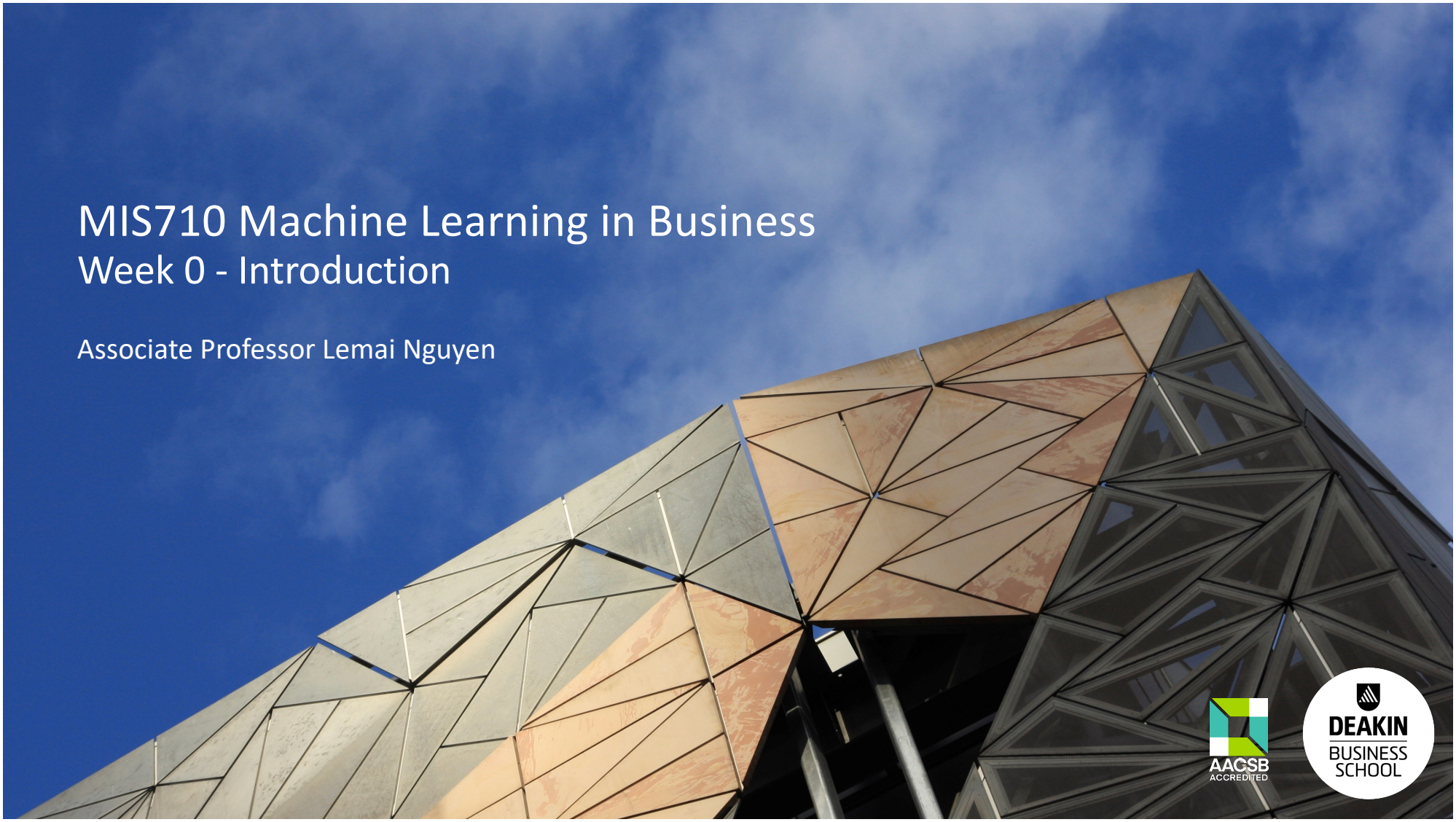


You should read this slide set

and

follow the instructions on slides 8 and 9

Complete the Intro Exercises

PRIOR TO

coming to the class in Week 1!

Introduction to Python and Colab

We use Python 3 and scikit-learn in MIS710

- Python is a programming language
- Interactive and popular
- We will use Python libraries, e.g., NumPy, Pandas, matplotlib, seaborn and more.
- scikit-learn is a free software machine learning library for Python

https://docs.python.org/3/tutorial/

https://scikit-learn.org/stable/

Introduction to Colab

Colab, or 'Colaboratory', allows you to write and execute Python in your browser

- Zero configuration required
- Access to GPUs free of charge
- Easy sharing, mount your google drive
- Colaboratory is built on top of Jupyter Notebook

https://colab.research.google.com/

Introduction to Colab

Cells:

- A notebook combines text, code, outputs and charts in a single document
- A notebook is a list of cells. Click a cell to select it.
- Cells can be either explanatory text or executable code; outputs and charts can be produced when code is executed.
- You can add, edit and remove cells
- Execute code cells

  https://colab.research.google.com/notebooks/basic_features_overview.ipynb#scrollTo=KR921S_OQSHG

- You can use **Google Gemini or ChatGPT** to write code, but you should **understand** it!

Variables

- A variable is a memory location to store values.
- A variable name
  - Must start with a letter or the underscore character
  - Cannot start with a number or any special character like $, (, * % etc.
  - Can only contain alpha-numeric characters and underscores (A-z, 0-9, and _)
  - Python variable names are case-sensitive
  - Python's reserved keywords cannot be used to name variables.

```
# Let's store value 100 in a variable
 account_balance=100
```

https://www.pythoncheatsheet.org/cheatsheet/basics

Assignment operators and comments

- Use operators to manipulate values
- Assignment operators,

  e.g., a=b assigns the value of b into a

```
# Let's store value 100 in a variable
account_balance=100
account_balance+=50
```

https://www.w3schools.com/python/gloss_python_assignment_operators.asp

https://www.pythoncheatsheet.org/cheatsheet/basics

- Use comments to document your coding

```
# This is a single-line comment.
```

```
''' This is a
multiple line
comment.
'''
```

Week 0: Setting the environment

- Step 1: Access Google Colab

  https://colab.research.google.com/

  Select your Google drive to store Colab notebooks

- Step 2: Locate the Colab Notebooks folder in your Google drive

  Create a folder MIS710 under the Colab Notebooks folder

- Step 3. Create a new Notebook

  Name the new file as MIS710 Lab0

  It will be saved under the Colab Notebooks folder, move it to the MIS710 folder

Week 0: Python basics

- Step 4. Download MIS710T1 Lab 0 from the unit site, Week 0, and upload to your Google Drive, Colab Notebooks, MIS710 folder. Open it.

  Read the Text cell.

  Add more text as you wish to familiarise yourself with editing and using Texts.

- Step 4. Add a new Code, type the following lines and run it

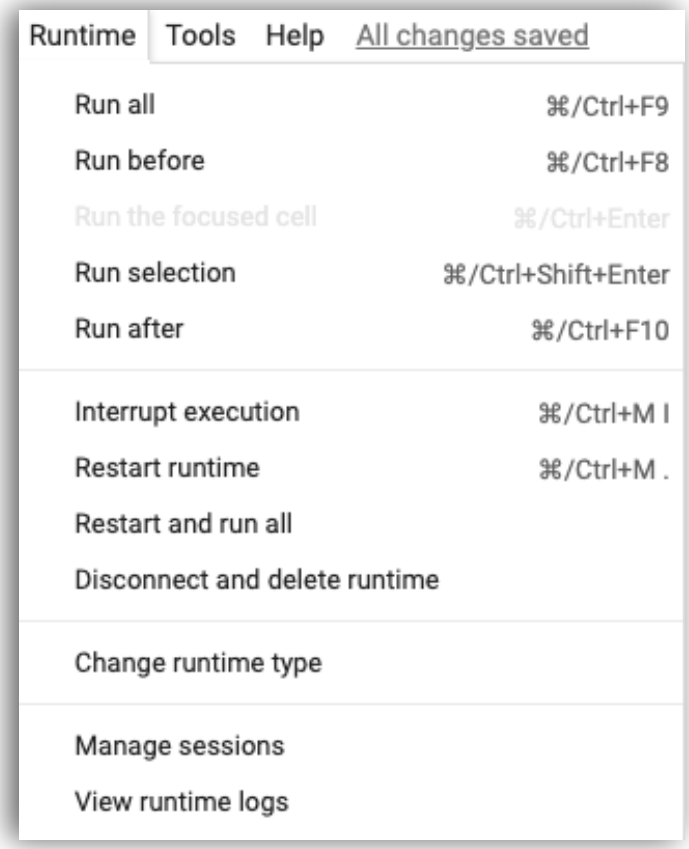
```
#Print a text saying Hello world to test if the setting is done
print('Hello world!')
```

- Step 5. Change the 'Hello world' text to your name, run it
- **Step 6. Introduction Exercises** Continue to add more Code cells and follow the instructions at the following site:

  https://swcarpentry.github.io/python-novice-inflammation/01-intro.html

Week 0: Execute code and Colab short cuts

- ctrl/⌘ + enter to run current cell
- ctrl/⌘ + shift + enter to run the selection
- alt/ ⌥ + enter to run current cell and create new cell below



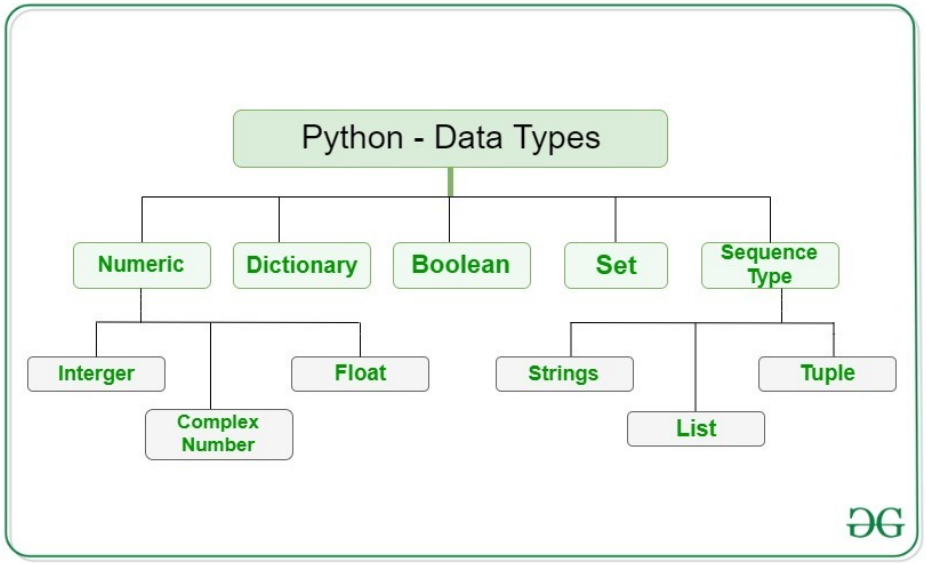
Step 6. Questions

- What basic data types can I work with in Python?
- How can I create a new variable in Python?
- How do I use a function?
- Can I change the value associated with a variable after I create it?

COMPLETE STEP 6 PRIOR TO THE CLASS IN WEEK 1

https://swcarpentry.github.io/python-novice-inflammation/01-intro.html

Introduction to Python data types and operators



https://www.geeksforgeeks.org/python-data-types/

- Math operators: ** / * - +
- Comparison Operators: == != >
- Logical operators: and or not

https://www.tutorialspoint.com/python/python_operators.htm

https://docs.python.org/3/tutorial/introduction.html

https://www.pythoncheatsheet.org/cheatsheet/basics

Introduction to useful Python libraries

- NumPy is a Python library to work with multi-dimensional arrays and matrices, and mathematical functions to operate on arrays
- The NumPy array is the fundamental data structure in scikit- learn. Data inside an array must be of the same type.
- pandas is a Python library for data manipulation and analysis on DataFrame tables. DataFrame columns can be of different types.
- matplotlib is a Python library with functions to produce visualisations such as line charts, histograms, scatter plots…
- seaborn is Python library based on matplotlib with a high-level interface for drawing attractive and informative statistical graphics.

https://medium.com/@d.goglia/top-12-cheat-sheet-for-data-science-in-python-4bf685dc3f37

Useful sites and Refs

- Useful Introduction exercises and tutorials:

  https://www.kaggle.com/learn/python

  https://swcarpentry.github.io/python-novice-inflammation/

  https://www.tutorialspoint.com/python/python_operators.htm

  https://learning.oreilly.com/library/view/python-machine-learning/9781119545637/c02.xhtml#head-2-6

- References:

  https://docs.python.org/3/tutorial/introduction.html

  https://www.pythoncheatsheet.org/cheatsheet/basics

See MIS710 List of Python Resources in Week 0

Programming is a practical skill!

Come to the Labs and share in the AICafe!
Practise and Learn from each other