

L-1

Foundations

MAIB7002
Fundamentals of AI Models and Technologies

Course Details

Team · Schedule · Assessment

Moodle and Ed

Log In to Ed and Reply to My Post

Group Project

Find Your Group Members and Sit Together

Introduce Yourself:

Name, Background, and One Thing You Hope to Learn

Let's Get to Know You

Today's Goals

- ☒ Identify the Course Expectations and Requirements
- ☐ Discuss Intelligence, Understanding, and Consciousness
- ☐ Run Python in the Course Environment

Build the Course Environment



Use One Computer per Group for This Activity · Ask a TA if You Get Stuck

1. Install Docker Desktop (<https://docs.docker.com/desktop/>)
2. Download and Extract the Docker Build Files (https://maib7002.dirk.hk/env_v01.zip)



- 3.1 Open Docker Desktop
- 3.2 Wait for the Engine to Start
- 3.3 Open Terminal in the Extracted Folder



- 3.1 Open PowerShell as Administrator and Run:
`wsl --install --no-distribution`
- 3.2 Restart Windows
- 3.3 Open Docker Desktop and Select WSL 2
- 3.4 Wait for the Engine to Start
- 3.5 Open PowerShell in the Extracted Folder

4. Run: `docker compose up`

5. Leave It Running

Discuss with Your Group

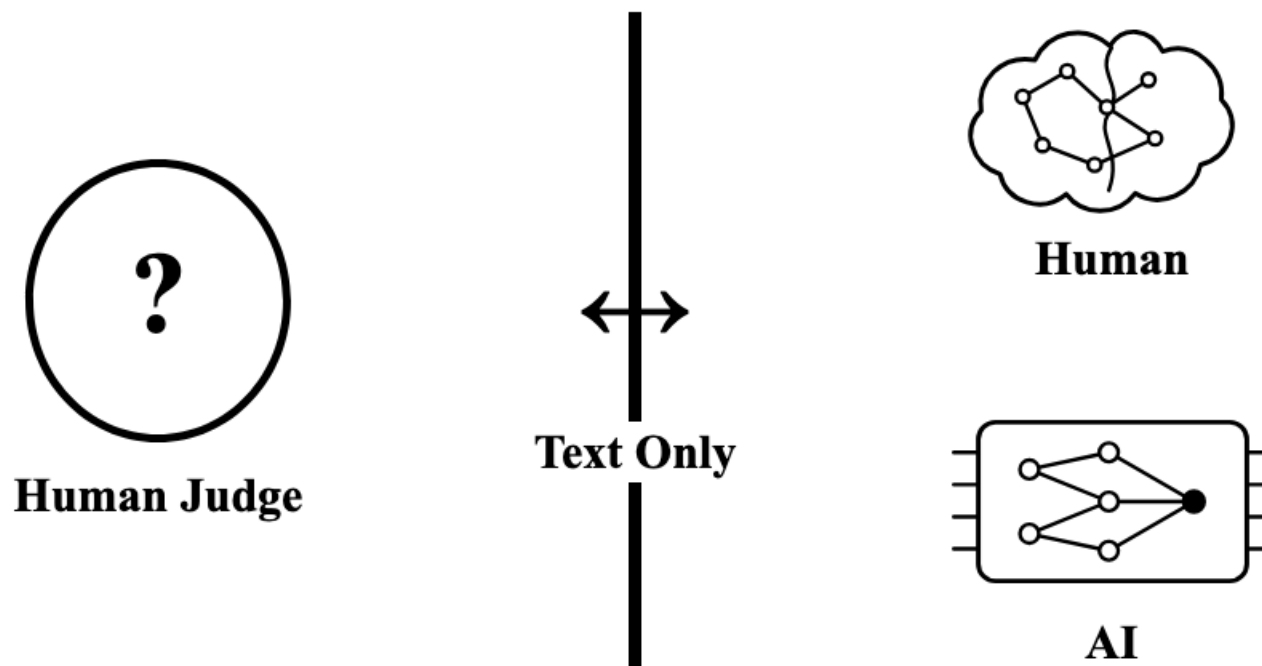
Which Would You Call Intelligent?

Calculator · Chess Program · Dog · ChatGPT

How Did Your Group Decide?

The Turing Test

Alan Turing · 1950



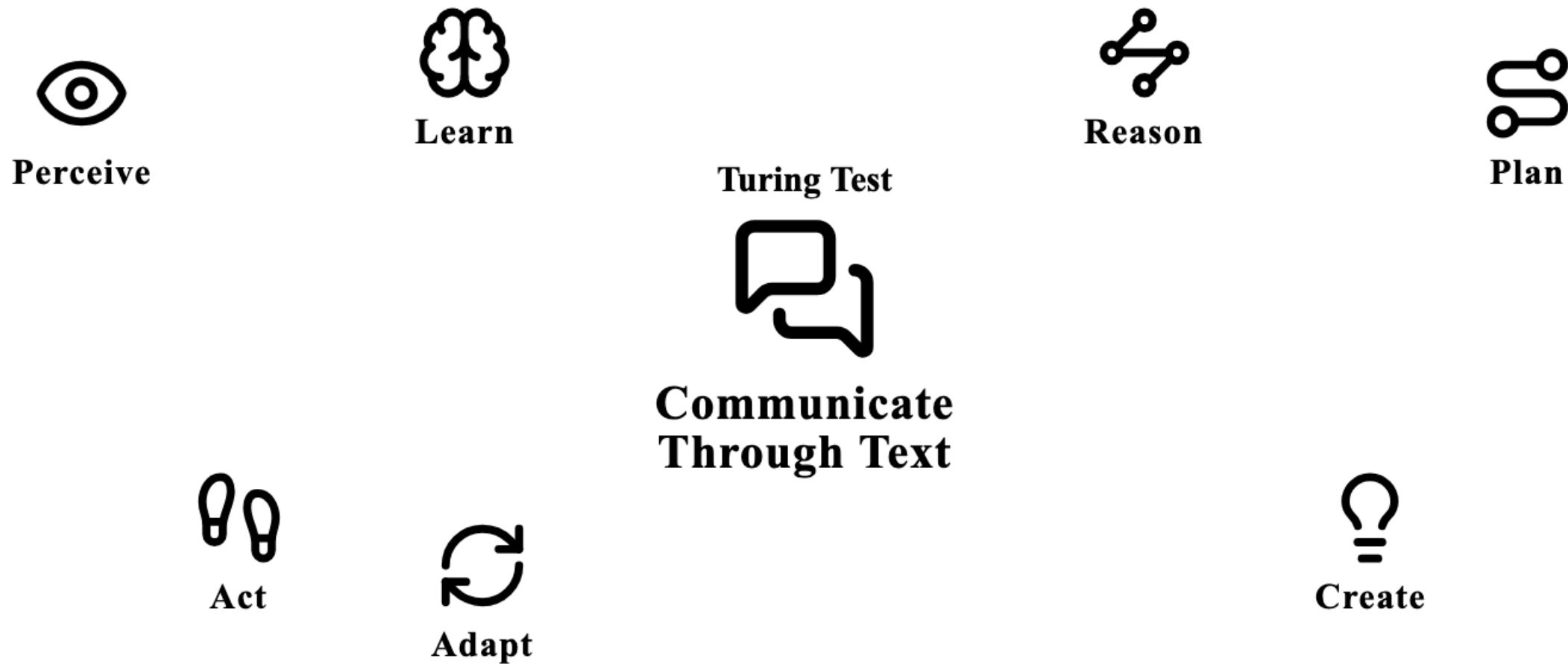
Judge Cannot Reliably Tell Which Is AI → AI Passes This Test

Turing's Idea
Judge AI by What It Can Do

What Would You Ask?

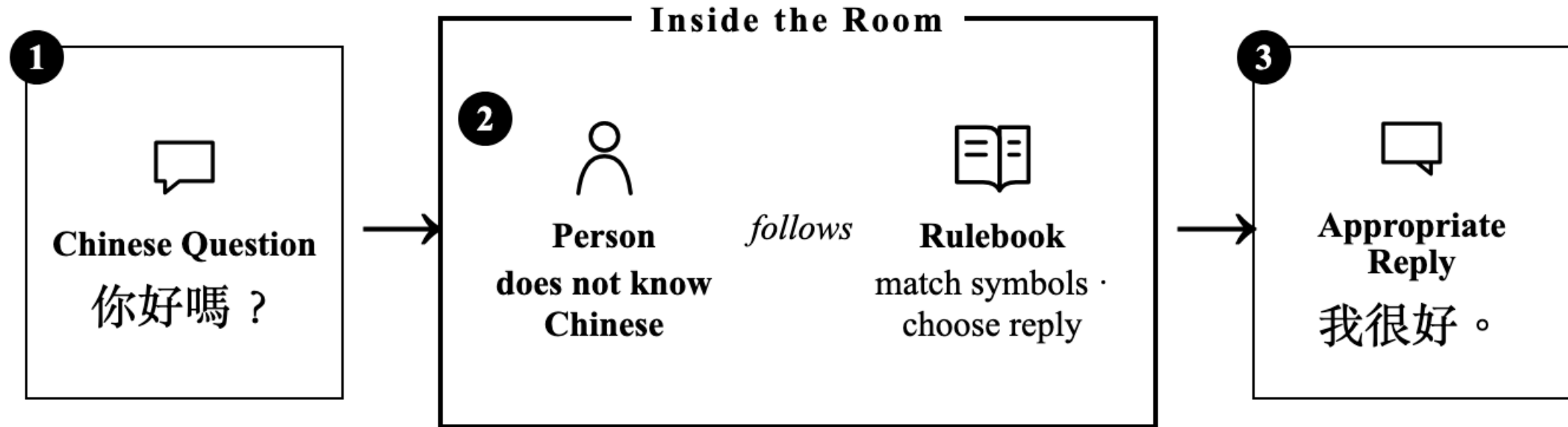
Could Today's AI Answer Convincingly?

What Does the Test Establish?



The Chinese Room

John Searle · 1980



Correct Reply $\neq$ Proof of Understanding



The Person Does Not Understand Chinese



Does It Follow That
the Whole System Does Not?

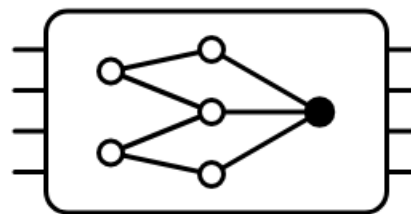
Symbol Grounding

Meeting a Cat



See · Hear · Touch · Interact

Learning from Text



cat $\leftrightarrow$ animal $\leftrightarrow$ fur $\leftrightarrow$ pet

What Connects the Word to the World?

Could You Know **Everything** About an Experience
Without Ever Having It?

Mary's Room

Frank Jackson · 1982



An Entire Life in Black and White

She Has Never Seen Colour

An Expert in Colour Vision

Knows **All** the Physical Facts

Mary's Room

Frank Jackson · 1982



One Day, Someone Shows Mary
a Red Apple

That Night, Can Mary Say:
“I Learned Something New Today”?

Conscious Experience
What It Feels Like to See Red

Philosophical Zombies

David Chalmers · 1996

Imagine Copying Every Physical Detail of a Person

A Person



Conscious Experience

Same Body

Same Brain

Same Behaviour

The Duplicate



No Conscious Experience

Is This Possible?

Could Everything Physical Match,
Yet Conscious Experience Be Absent?

Why Does This Matter?

Are the Physical Facts Enough
to Determine Conscious Experience?

```
graph TD; A[Are the Physical Facts Enough to Determine Conscious Experience?] --> B[If a Zombie Is Possible  
Physical Facts Alone  
Do Not Determine Experience]; A --> C[If a Zombie Is Impossible  
This Counterexample  
to a Physical Account Fails];
```

If a Zombie Is Possible

Physical Facts Alone
Do Not Determine Experience

If a Zombie Is Impossible

This Counterexample
to a Physical Account Fails

What Does Your Group Think?

Discuss with Your Group · Two Minutes

Possible

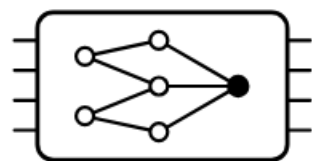
Every Physical Detail Matches.
Experience Could Still Be Absent.

Impossible

Every Physical Detail Matches.
Experience Must Be the Same.

Choose Your Position

What Would Convince You?



“I Understand How You Feel.”

Behaviour

Does It Respond Appropriately?

Understanding

Does It Grasp the Meaning?

Experience

Does It Feel Anything?

Which of These Claims Does This Sentence Support?

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5. Leave It Running

6. Once the setup is ready, open the localhost link containing `?token=...`

Hello, MAIB7002!

1. Open [hello.ipynb](#) in JupyterLab

Select the Greeting Cell and Press Shift+Enter

2. Change the Message to Include Your Group

```
print("Hello, MAIB7002! We are Group 3.")
```

Use Your Own Group Number · Run the Cell Again

3. Save Your Notebook

Click the Save Button in JupyterLab

Run Steps 2–3 in [hello.ipynb](#)

Compare Your Output with the Group Next to You

Why Did Your Versions Match?



Mac

Your Other Apps

MAIB7002 Container

OS: Debian GNU/Linux 13 (trixie)

Python: 3.12.14

NumPy: 2.5.2

scikit-learn: 1.9.0

Matplotlib: 3.11.1



Windows

Your Other Apps

MAIB7002 Container

OS: Debian GNU/Linux 13 (trixie)

Python: 3.12.14

NumPy: 2.5.2

scikit-learn: 1.9.0

Matplotlib: 3.11.1

The Course Tools Travel Together

Stop and Start the Container



Stop the Container

Ctrl+C

In the Docker Compose Terminal



Start It Again

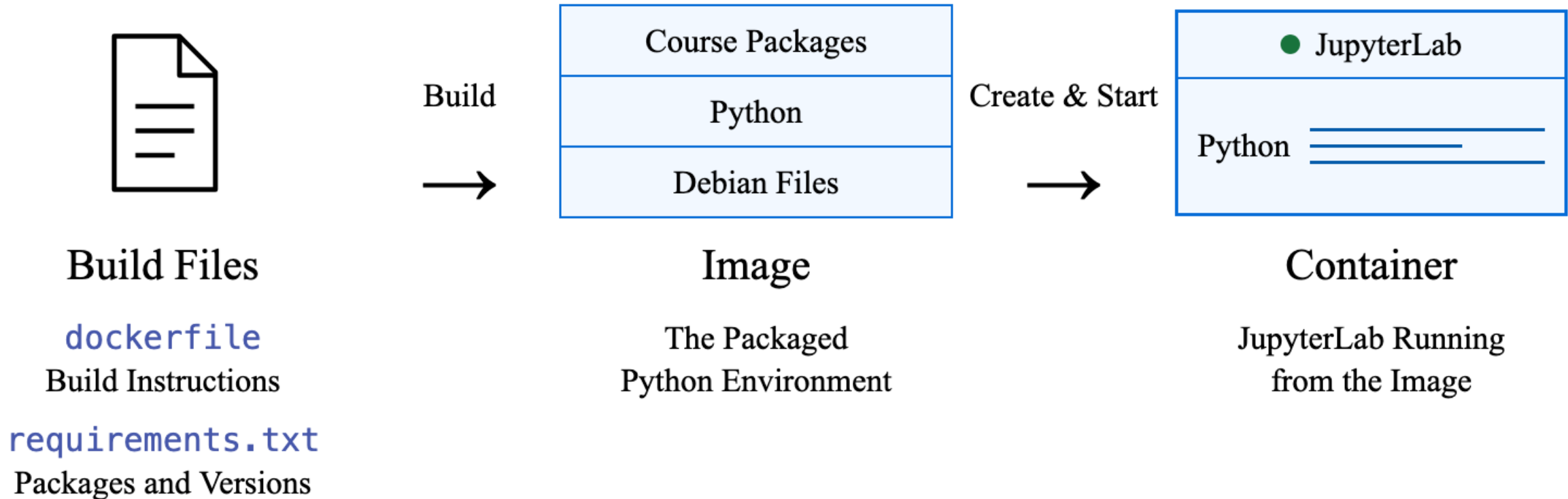
docker compose up

From the Same Folder

Reopen [hello.ipynb](#) in JupyterLab

Is Your Group's Greeting Still There?

From Instructions to a Running Container

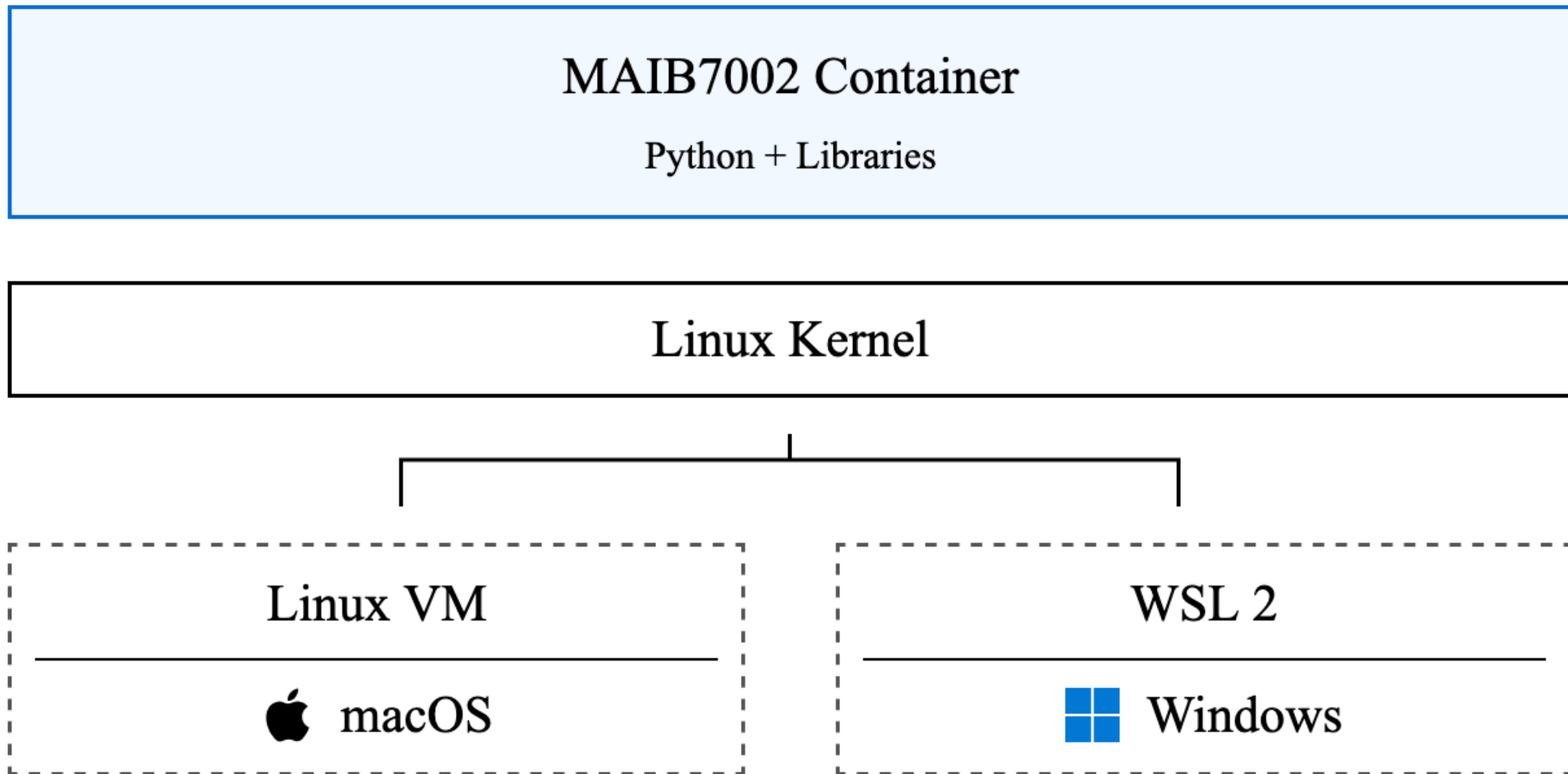


docker compose up

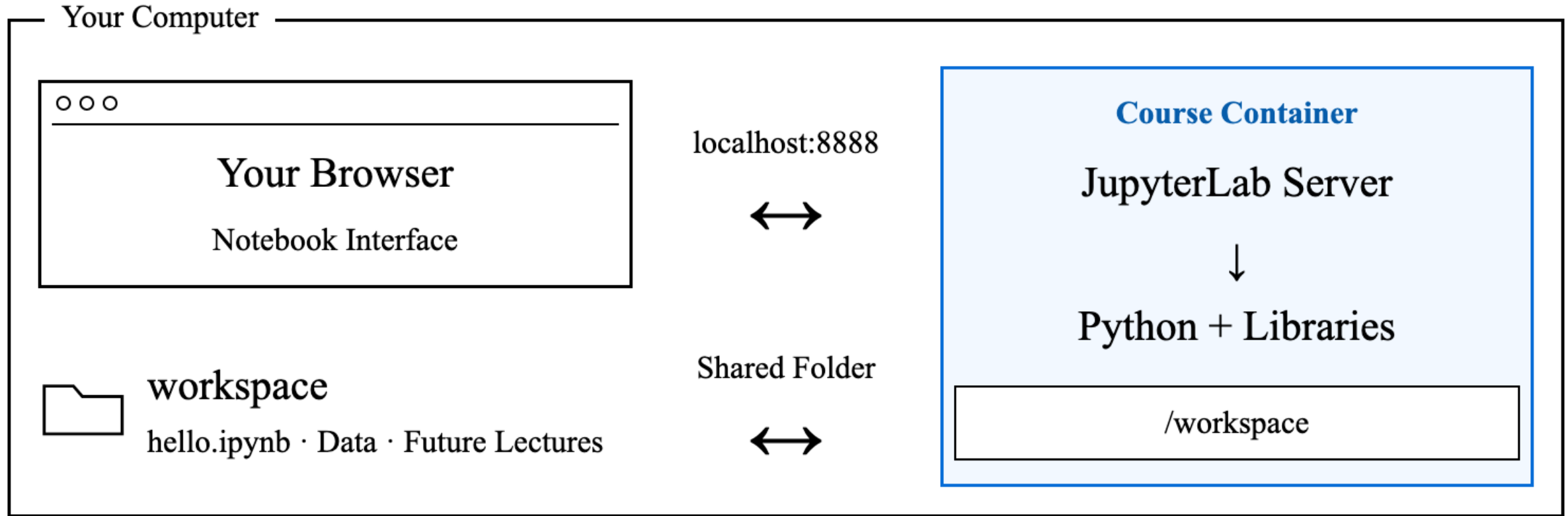
Reads `compose.yaml` · Builds the Image If Needed · Starts lab

Why Does a Mac Report Linux?

The Same Structure on Each Computer



Where Do Your Code and Files Live?



Stop the Container. Keep Your Saved Work.

From Data to a Prediction

What Can Daily Bike-Rental Data Tell Us?

Inspect

pandas



Calculate

NumPy



Visualise

Matplotlib



Predict

scikit-learn

Run and Modify Supplied Python Examples
and Interpret Their Outputs

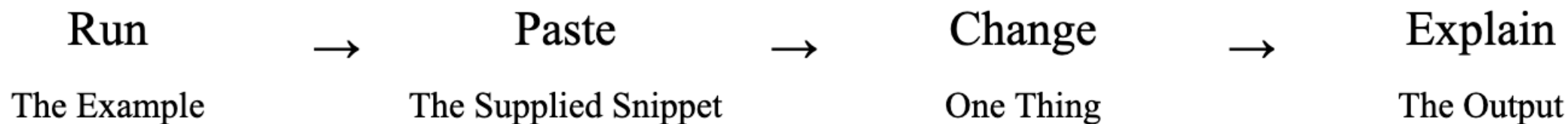
Open the L1 Tutorials

1. Download and Unzip `L1.zip`
2. Move `l1` into `workspace`
3. Open `l1` in JupyterLab

```
env_v01/  
└─ workspace/  
    └─ l1/
```

maib7002.dirk.hk/L1.zip

How to Work Together



Rotate the Keyboard After Each Notebook

pandas: Meet the Data

Date	Temperature (°C)	Rentals
2011-01-01	14.11	985
2011-01-02	14.9	801
2011-01-03	8.05	1,349
2011-01-04	8.2	1,562

Optional Challenge

Compare Average Rentals on Working
and Non-Working Days

NumPy: Calculate with Data

985

801

1,349

1,562

1,600



Multiply Each Value by 1.10

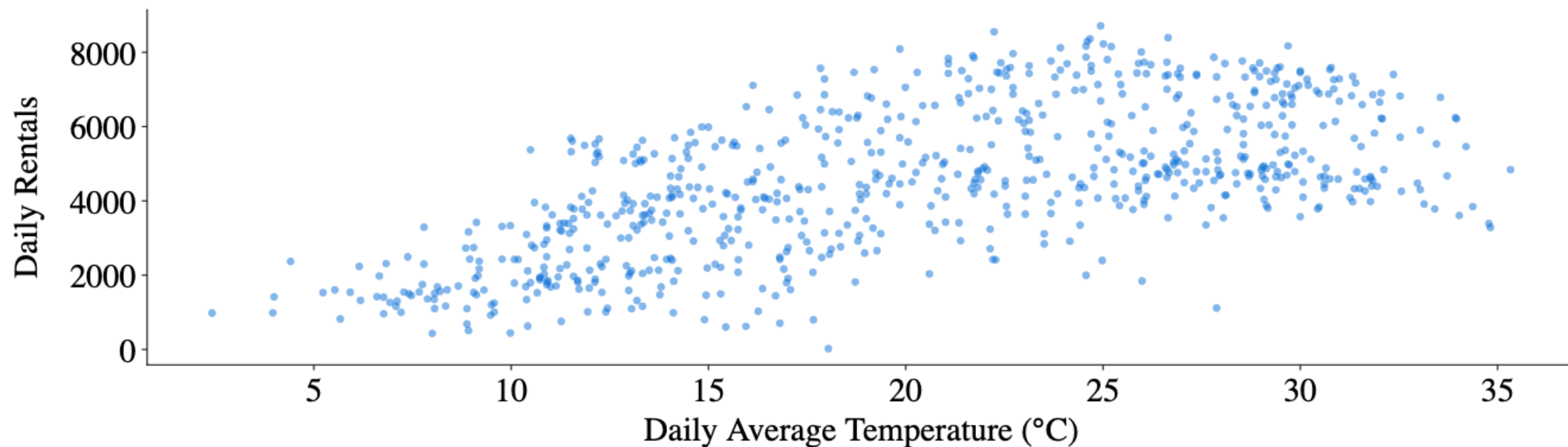
Optional Challenge

Add an Extreme Value

Compare the Mean and Median

Demo 4 · [02_numpy.ipynb](#)

Matplotlib: See a Pattern



Optional Challenge

Show 2011 and 2012 in Different Colours

Add a Legend and Compare

scikit-learn: Try a Learned Model



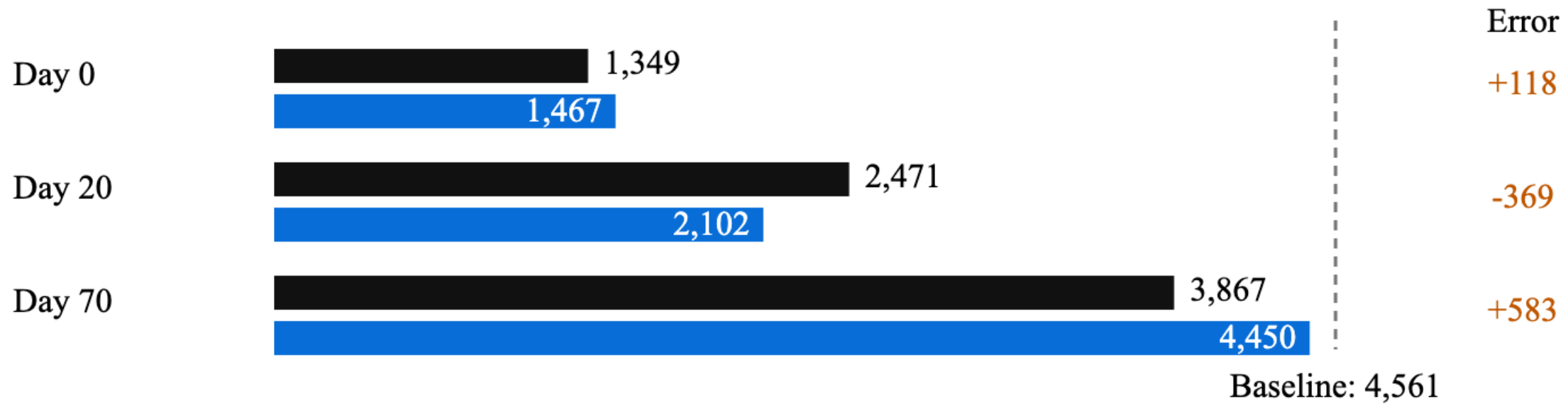
Optional Challenge

Find a Test Day with an Error
of at Least 1,500 Rentals

Demo 4 · [04_sklearn.ipynb](#)

How Good Are the Predictions?

■ Recorded Rentals ■ Our Model



Unseen Data

These Days Were Not Used for Training

A Simple Baseline

Always Predict the Training Average

Examine the Errors

How Large? Which Direction? When?

Good Enough for the Decision?

Predict Demand →

Plan Bike Availability

Underestimate



Risk: Customers Cannot Find Bikes

Overestimate



Risk: Bikes Sit Unused

Consequences

Do Both Mistakes Cost the Same?

Conditions

Will It Work Where We Need It?

Human Checking

When Should Someone Step In?

Accurate Predictions Matter
Their Consequences Matter Too

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Three Ways to Learn

Which Did We Just Use?

Supervised
Learning

Unsupervised
Learning

Reinforcement
Learning

Where We Go Next

L2–L3		Supervised Learning
L4		Model Evaluation and Interpretation
L5		Unsupervised Learning
L6–L7		Reinforcement Learning
L8		Review and Project Clinic
L9–L10		Project Poster Exhibition

The Same Python Environment Will Support Our Work Throughout the Course

Exit Ticket