Fundamental Programming Course
Week 8

Huseh-Ting Chu@Asia University, 2022

Schedule

M1 M2 M3

Week 1   Week 5   Week 6   Week 7   Week 11   Week 12   Week 13   Week 17   Week 18

(9/12)   (10/10)   (10/17)   (10/24)   (11/21)   (11/28)   (12/5)   (1/12)   (1/9)

Off   M1Test   M2Pretest   M2Test   M3 Pretest   M3Test
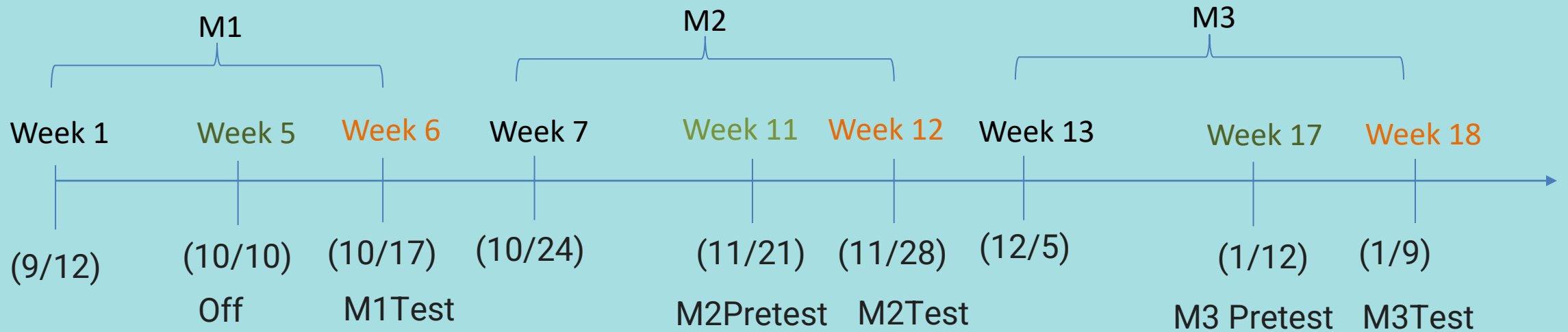
Syllabus

- W1-Python Introduction and Programming Tools
- W2-Variables and Operations
- W3-Loop and formatted output
- W4-Condition and Containers
- W5-String and built-in functions
- W6-M1 test

- W07-Dictionary Container
- W08-File I/O
- W09-Function
- W10-Advanced flow control
- W11-Advanced operations and generators
- W12-M2 test

- W13-Advanced functions
- W14-Class fundamentals (classes, objects, properties, constructors, methods)
- W15-Advanced Classes (Static methods, class Methods and class decorators)
- W16-Modules and Packages
- W17-Advanced programming(Argparse and Venv)
- W18-M3 test
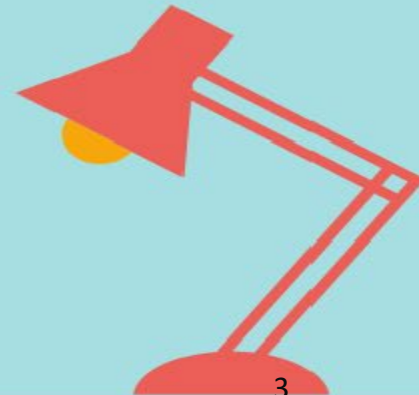
Outline

- Week9 - File Handling
  - Topic 1 - writing to archives: open() and print() functions
  - Topic 2 - read file: open() and for line in fin
  - Topic 3 - reading and writing archives: f.read() and f.write()
  - Topic 4 - using **with**
  - Topic 5 (Topic 5) - Sorting
  - Topic 6 (Topic 6) - Review variable types
  - Topic 7 (Topic 7) - Decimal number operations
  - Topic 8 - Review Formatted Output

IPO Model (W9)

Input → Process → Output
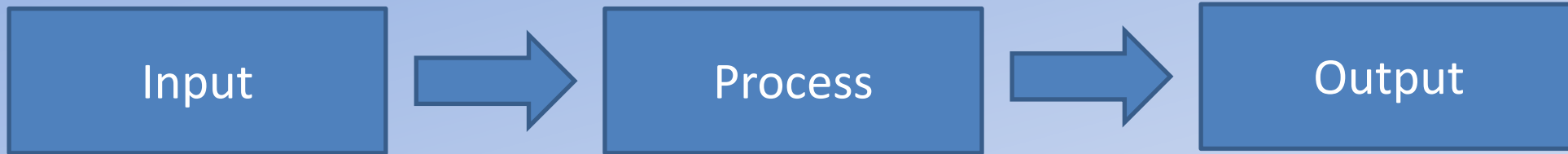
Input
從檔案輸入資料
I/O函數:open()
I/O函數:read()

Process
使用for 迴圈讀入檔案內容
with/as的使用
資料排序, sorted()函數
內建函數max()/min()函數

Output
I/O函數:close()
I/O函數:write()

Topic 1-open() and print()

```python
fout = open('score.txt', 'w')
for score in scores:
  print(score, file=fout)
fout.close()
```
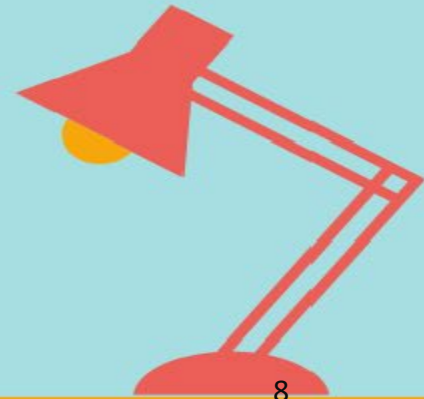
Topic 2-for line in fin

```
count=0
fin=open('score.txt')
for line in fin:
    count +=1
fin.close()
print(f"The number is {count}")
```

Topic 3: f.read() and f.write()

- Methods of File Objects:
  - f.read(size)
  - f.readline()
  - f.write(string)
  - f.seek(5)
  - f.tell()
  - f.close()
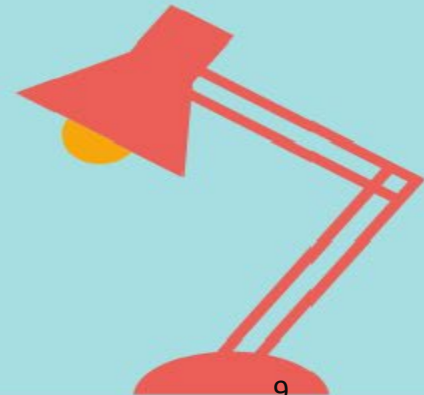
Topic 4-using with

```python
count = 0
total = 0
with open('score.txt') as fin:
    for line in fin:
        count += 1
        total += int(line)
print(f"Average score= {total/count:.2f}")
```

Topic 5-sorting

- Using obj.sort()
- scores.sort(reverse = False)
- scores.sort(reverse = True)

- Using sorted() function
- sorted(scores,reverse = False)
- sorted(scores,reverse = True)

Topic 6: variable types

- Numeric types: int, float, bool
- String type: str
- A character is also a string
- Container type: list, tuple, set, dict

Function	Description
chr()	Converts an integer to a character
ord()	Converts a character to an integer
len()	Returns the length of a string
str()	Returns a string representation of an object

Topic 7- Decimal

```python
a = round(Decimal('0.70') * Decimal('1.05'), 2)
b = round(.70 * 1.05, 2)
print(f"{a}")
print(f"{b}")
```
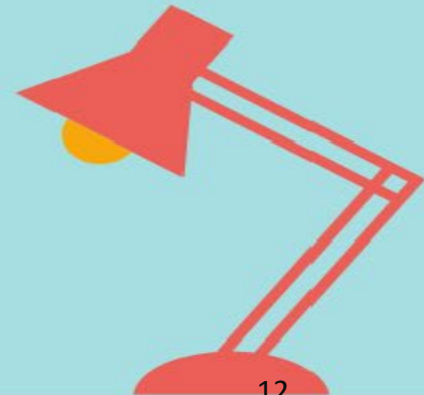
Topic 8-Formatting

%-formatting
print('Art: %5d, Price per Unit: %8.2f' % (435, 59.058))

str-format（Python 2.6+）
print("Art: {0:5d}, Price per Unit: {1:8.2f}".format(435, 59.058))

f-string （Python 3.6+）
A = 435; B = 59.058
print(f"Art:{A:5d}, Price per Unit: {B:8.2f}")

```
>>> n = 27
```

binary	octal	hex	HEX	decimal
f"{n:7b}	f"{n:7o}	f"{n:7x}	f"{n:7X}	f"{n:7d}
' 11011'	' 33'	' 1b'	' 1B'	' 27'

Thanks! Q&A