新北市立忠孝國中 Python 與 Chateverywhere 探索 (雙語)

This course design is meant to be bilingual and can be used by foreign teachers. It guides students to understand programming languages using AI natural language modules.

本教案設計為雙語教案，同時亦可給外師使用，指引學生透過 Chat everywhere 的 AI 自然語言模組，學習程式語言。

領域/科目 Subject	資訊科技/Python 教學 Information Technology/Python	設計者 Author	何政賢 Cheng-Hsien Ho
參加組別	**X 程式教育組　　□人工智慧組　　□資訊素養與倫 理組**		
實施年級 Grade	九 9	教學節次 classes	共 4 節 4 classes
單元名稱 Unit Name	Python 與 Chateverywhere 探索 Python and Chateverywhere Exploration		
設計依據			

| 學習
重點
Key
Learning
Points | 學習表現
Learning Performance. | ● 運 t-IV-1 能了解資訊系統的基本組成架構與運算原理。 運 C-t-IV-1 Be able to understand the components and operations of computing systems.
● 運 t-V-2 能使用程式設計實現運算思維的解題方法。 C-t-IV-4 Be able to apply computational thinking to analyze problems
● 運 c-IV-3 能應用資訊科技與他人合作進行數位創作。 C-c-IV-3 Be able to apply information technology to collaborate with others in the completion of artifacts creation
● 運 p-IV-3 能有系統地 | 核心
素養
Core
Competency | **科 J-B2**
理解資訊與科技的基本原理，具備媒體識讀的能力，並能了解人與科技、資訊、媒體的互動關係。

J-B2 Possess the competency of effectively using technology, information, and media to enhance learning, and perceive and speculate about humans' interactions and relationships with technology, information, and media.

科 S-U-B2
理解科技與資訊的 |

	重點	整理數位資源。 C-p-IV-3 Be able to systematically organize digital resources ● 運 a-V-5 能主動探索資訊科技新知。 C-a-V-5 Be able to proactively explore new concepts on information technology ●		原理及發展趨勢，整合運用科技、資訊及媒體，並能分析思辨人與科技、社會、環境的關係。 U-B2 Possess the competency of appropriately using technology, information, and media to interpret and criticize media information, and be able to reflect on ethical topics related to technology, information, and media
	學習內容 Learning Contents	● 資 P-V-1 文字式程式設計概念與實作。 I-P-V-1 Concepts and hands-on practice of textual programming ● 資 P-V-3 重要演算法的程式設計實作。 I-P-V-3 Hands-on programming of important algorithms		
議題融入	實質內涵	● 環 E16 了解物質循環與資源回收利用的原理。 Understand the principles of material cycling and resource recycling and utilization." ● 環 E17 養成日常生活節約用水、用電、物質的行為，減少資源的消耗。 Develop daily habits of conserving water, electricity, and materials to reduce resource consumption ● 環 J15 認識產品的生命週期，探討其生態足跡、水足跡及碳足跡。 Gain an understanding of the life cycle of products and explore their ecological footprint, water footprint, and carbon footprint		
	所融入之學習重點	● 能運用程式設計探索環境保育相關議題。 ● 提升對環境保育的認知 ● 提升環境保育問題解決能力		

		● 提高學生對數據處理的能力
與其他領域/科目的連結		●
教材來源		
教學設備/資源		**Repl.it (網站資源)** **Chat Everywhere (ChatGPT)** **學習吧** **Canva**

學習目標 Learning objectives

- Innovates students' interest in environmental protection.
- Cultivate students' problem-solving abilities.
- Enhance students' logical thinking skills.
- Improve students' data processing capabilities.
- Utilize AI prompts to learn about Python's input syntax.
- Understand the syntax structure of Python's if-else statements.
- Familiarize with the syntax structure of Python's for loops.
- Acquire knowledge of Python's if-else syntax structure.

- **激發學生對環境保護的興趣**
- **培養學生的問題解決能力**
- **強化學生的邏輯思考能力**
- **提高學生的數據處理能力**
- **透過 AI prompt(提示) 知悉 python 的 輸入語法**
- **了解 python 的 if else 語法結構**
- **了解 python 的 for 迴圈的語法結構**
- **知悉 python 的 if else 語法結構**

教學活動設計
Course flow
課程流程

1. 建立網站帳號
2. 完成第一次 AI 指引"Who are you, and hello nice to meet you"
3. 完成 AI 挑戰一 "Carbon Footprint"
4. 完成 AI 挑戰二 "Save Energy Please!"
5. 完成 AI 挑戰三 "Water with Prime numbers within 100 days."
6. 完成 AI 挑戰四 "Too many trash!."
7. 完成最後的 AI 挑戰"小遊戲"
8. 總結課程

1. Create website accounts
2. Complete the AI prompt for the first time of "Who are you, and hello nice to meet you".
3. Complete the first AI challenge of "Carbon Footprint"
4. Complete the Second AI challenge of "Save Energy Please!"
5. Complete the Third AI challenge of "Water with Prime numbers within 100 days."
6. Complete the Fourth AI challenge of "Too many trash!"
7. Complete The last AI challenge of "Mini game"
8. Summerize the course.

| 教學活動內容及實施方式	時間	備註
PreClass 預先課程 This course is for the students who doesn't have accounts for the websites to complete their work. This provides the necessary time for registration and preparation to get things going. -此課程主要是針對還未完成設定帳號的學生設計的，提供需要的時段給學生註冊及準備相關課程資源 1. Use 25 minutes to guide the students to register course required resources. 　先運用２５分鐘的時間引導學生註冊所有相關課程用的活動資源 2. Repl.it (寫程式設計的地方) Explanation 說明: Repl.it provides a free interface for students to write Python programs, eliminating the need for system installation and compatibility issues across different platforms. It also allows programming from anywhere, making it an ideal teaching tool. Repl.it 提供一個免費的介面能夠讓學生在上面進行 Python 程式的撰寫，免除系統安裝及不同系統平台的相容性問題，同時也可以保障在任何地方都可以撰寫，因此採用此網站進行教學。 　a. Click the the "Sign Up" on the top-right to guide the students to register the Python workspace. 　點選右上角 Sign Up 指引學生註冊 Python 的工作區	**25**	
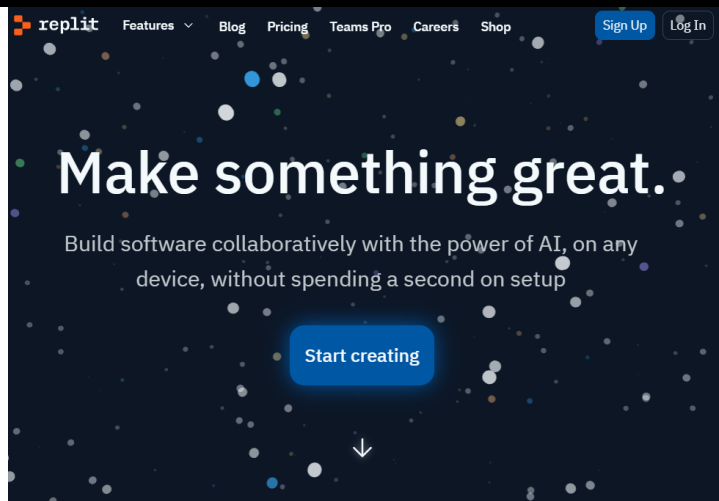
b. Create a repl to let students to code and execute python codes.
建立一個 Repl 來讓學生撰寫及執行 Python 程式碼.
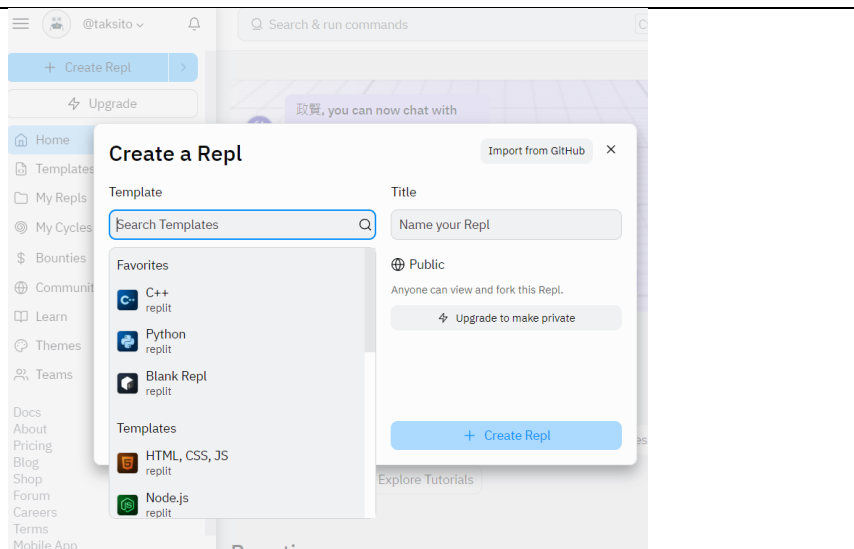
c. Create the first Repl.
建立第一個 Repl
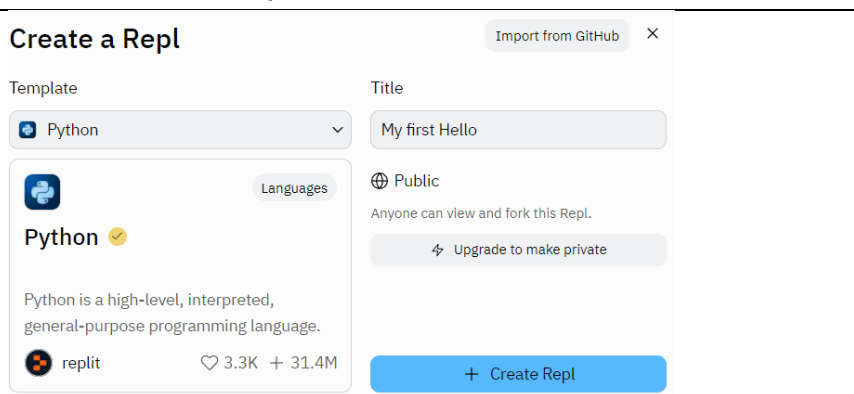
5min

d. Have the students to type in Print("hello") in the main.py and click run to complete the first code.
請學生打入 Print("hello") 在 main.py 然後點擊 RUN，完成第一次程式。

e. Students formed in groups to check if they have completed their tasks.

請學生在小組間檢視是否有完成作業。

3. Chat Everywhere (互動平台的地方)

Explanation 說明:
Using Chat Everywhere as a platform to guide students in completing assignments (whether registered or not, registration allows recording of conversation content for students' future reference). Through this platform, students are guided to interact with AI to complete their assignments

運用 Chat Everywhere 來引導學生完成作業的地方(可註冊或是不註冊，註冊可以記錄對話內容，方便學生日後的查詢。) 透過此平台引導學生與 AI 對話完成作業的內容。

10min

4. Homework platform "Learnmode" 作業平台學習吧
For the assignment platform section, please use Learnmode and have students take screenshots of their operation results. Take two screenshots, one for Chat Everywhere and another for repl.it operations.

針對作業平台部分，請學生截圖操作結果的圖片截圖兩張(分別為 Chat Everywhere 的對話及 Repl.it 的操作)
** Google classroom can be used as well. **

5min

5. Extra resources for students
提供學生額外的教學資源(提供查詢)

**Extra resources 額外資源

Python guide (chinese) 教學網站(中文)
https://steam.oxxostudio.tw/category/python/index.html
English resources 英文資源
https://www.learnpython.org/
https://www.w3schools.com/python/default.asp
(Please use w3school as primary references）

When all the tasks above are completed. Please have the students do the following assignment.
當以上工作皆完成後，學生

6. AI prompt for the first time.
● 首次 AI 提示

Problem 問題:
Who are you? and hello nice to meet you.

請問你是誰? 很高興認識你! ● In this exercise, you'll be asking Chat Everywhere to program a python code to question the user's name and print it out with "name, hello! Nice to meet you". 在這個練習中，你將要求 Chat Everywhere 編寫一個 Python 程式碼，詢問使用者的名字並將其與「name, hello! Nice to meet you」一起輸出。 ● Ai prompt : Program a python code that can ask user to input their name and print the "name , hello! Nice to meet you"? AI 提示：編寫一個 Python 程式碼，可以要求使用者輸入他們的名字，並輸出「name, hello! Nice to meet you」 ```python\nname = input("Please enter your name: ")\nprint(f"{name}, hello! Nice to meet you.")\n``` a. Give students the opportunity to explore the syntax and try using AI to help them write the program. 先給學生探索語法的寫法，先讓他們先行嘗試運用 AI 幫忙寫程式。 b. After 10 minutes, the teacher guides the students on how to use prompt techniques to complete the first challenge. 十分鐘後，教師引導學生如何運用 prompt (引導) 技巧，來完成第一個挑戰。 c. Understanding the syntax Input, f{name} 認識語法 Input, f{name} 請詳細問一下 f{}的運用是如何? 是否有其他不應用 f{}的方法? Ai prompt: What's f{name} for? Ai prompt: can you use + in the code? (文字加文字) *Students need to understand how to use input, and understand what does "name" variable usage in the input. 學生需理解 input 的用途，知道 name 裡面會存 input 的結果 *Students need to understand the benefit of f{name}. If there is no "f" in the print, it will require "+" or % to code the program. 學生需理解 f{name}的好處，如果沒有用 f 在 print 裡面，則會需要用+或是% 來撰寫程式。 **標記前六位完成的學生**當分組依據，將擔任各小組的學習指導老師，依次完成學習任務。	**12min**	
Class 2 1. Have the student prepare the necessary criteria of the work.	**5min**	

2. Brief last class' course and start to have the students start to work on the first AI challenges. 3. AI challenge 1 　　AI 挑戰一	20min	

Problem: Your Carbon footprint
In this exercise, you'll be calculating your carbon footprint based on your car, bus and train mileage together with your meat and vegetable consumption. You'll ask the Chat Everywhere to teach you how to use the python to calculate the total carbon footprint and print it out.

在這個練習中，你將根據你的汽車、公車和火車里程以及肉類和蔬菜的消耗量來計算你的碳足跡。你將請求 Chat Everywhere 教你如何使用 Python 來計算總碳足跡並將其輸出打印出來。

Vocabuary:

Carbon 碳 n.

mileage 里程 n.

consumption 消耗 n.

Sample Prompt：

Please give me a python code that ask me to input car, bus and train mileage together with your meat and vegetable consumption

Sample results:

```python
# Get user input
car_mileage = float(input("Enter the fuel consumption per kilometer for your car (l
bus_mileage = float(input("Enter the fuel consumption per kilometer for buses (lite
train_mileage = float(input("Enter the fuel consumption per kilometer for trains (l
meat_consumption = float(input("Enter your weekly meat consumption (kilograms): "))
vegetable_consumption = float(input("Enter your weekly vegetable consumption (kilog

# Calculate carbon footprint
car_emission = car_mileage * 2.31   # Calculate the carbon emissions for the car bas
bus_emission = bus_mileage * 2.31   # Calculate the carbon emissions for buses based
train_emission = train_mileage * 2.31   # Calculate the carbon emissions for trains
meat_emission = meat_consumption * 7.61   # Calculate the carbon emissions for meat
vegetable_emission = vegetable_consumption * 2.83   # Calculate the carbon emissions

total_emission = car_emission + bus_emission + train_emission + meat_emission + veg

# Output the result
print(f"Your carbon footprint is: {total_emission} kilograms of CO2 equivalent per
```

*The students ared instructed to understand the usage of = and + notation.
學生將被指示理解等號（=）和加號（+）符號的用法。

*The students understand how to print out the number.
學生理解如何將數字打印出來。

4. AI challenge 2 AI 挑戰二	20min	

Problem:

Save Energy Please!
In this exercise, you'll be asking the user to input the number of lights in this household, and how many hours of air conditioner the user leave it on.
If Numbers of lights * 0.06 + hours of ac usage*1.5 > 10, please tell the user to save energy, if it is lower than 10 just tell the user "Good job."

Vocabuary:

household 家庭 n.

usage 使用量 n.

Sample input and output:

Input:	Output:
Number of lights:10 Hours of AC:7	Your consumption is 11.1. Please save more energy.
Number of lights:5 Hours of AC:5	Your consumption is 7.8 Good Job.

Sample results:

```python
# Get user input
num_lights = int(input("Please enter the number of lights in your household: "))
ac_hours = float(input("Please enter the number of hours you leave your air conditi

# Calculate energy usage
lights_usage = num_lights * 0.06  # Calculate the energy usage for lights (assuming
ac_usage = ac_hours * 1.5  # Calculate the energy usage for the air conditioner (as

total_usage = lights_usage + ac_usage  # Calculate the total energy usage

# Output energy usage and energy-saving suggestions
if total_usage > 10:
    print("Your household's energy consumption is relatively high. Please save more
else:
    print("Good job! Your household's energy consumption is relatively low.")
```

*The students will understand how to ask the ai to prompt the proper results. 學生將理解如何要求 AI 提示正確的結果。
*The students will understand how to use the if and else.
學生將理解如何使用 if 和 else 語句。
Submit the chat Everywhere ai prompt and the python code.
請提交 Chat Everywhere AI 的提示和 Python 代碼。

Ai challenge 1	score	Ai challenge 2	score
AI prompt properly AI提示正確	45	AI prompt properly AI提示正確	45
Transition to repl.it 程式轉移至replit	45	Transition to repl.it 程式轉移至replit	45
Teamwork 組內合作	10	Teamwork 組內合作	10

Class 3
1. Have the student prepare the necessary criteria of the work.
2. Brief last class' course and start to have the students working on the second AI challenges.

5min

3. AI challenge 3

20min

AI 挑戰三

Problem:

Water with Prime numbers within 100 days.

In this exercise, you'll be assumed to be living in a water regulated area for 100 days, you can only receive water when the adminisator advised. You just found out that the day you can go fetch water is a prime number of date. you'll be asking Chat Everywhere to program a python code for your family to input a number within 100. To make the problem easier to understand for your family, have the chat everywhere not use square roots and function in this prompt.

在這個練習中，假設你在一個有水資源管理的地區生活了 100 天，只有在管理員通知的日子才能取得水。你剛剛發現你可以去取水的日子是一個小於 100 的質數。你將請求 Chat Everywhere 為你的家人編寫一個 Python 代碼，讓他們輸入一個在 100 以內的數字。為了讓你的家人更容易理解問題，本提示中 Chat Everywhere 不使用平方根和函數。

Vocabuary

regulated 限制 adj.

administrator 管理人員 n.

advise 建議 v.

fetch 取得 v.

square roots 平方根 n.

Sample results

```python
# Enter a number within 100
number = int(input("Enter a number within 100: "))

# Check if it is a prime number
is_prime = True
if number < 2:
    is_prime = False
else:
    for i in range(2, number):
        if number % i == 0:
            is_prime = False
            break

# Output the result
if is_prime:
    print(f"{number} is a prime number.")
else:
    print(f"{number} is not a prime number.")
```

Input: Your Date: 7	Output: Today is water day, Go!
Your Date: 14	Today is not water day.

Teacher Instructions:

| 1. Have students form in groups to discuss the problem, and understand the problem.
2. Have the students write down possible AI prompt require for this class.
3. Have the students check for vocabuary required for this context.
4. Have the students prompt the AI and see if they results are met.
5. Complete the codes to the problem and submitted them to the learnmode along with ai prompt results.

1. 請學生分組討論問題，並理解問題的內容。

2. 請學生寫下可能需要的 AI 提示，以便進行這個課程。

3. 請學生檢查這個情境所需的詞彙。

4. 請學生提示 AI 並檢查結果是否符合要求。

5. 完成問題的程式碼並將其與 AI 提示結果一起提交到學習吧。 | **20min** |

4. AI challenge 4

AI 挑戰四 (You can try to do this without using AI)

Problem:

Too many trash! 太多垃圾了 John hardly goes out to throw the trash, and the garbage truck only shows up on certain dates. The number of bags of trash created by

John is based on how many days he didn't throw the trash. For example, if John didn't throw the trash for 10 days, the number of bags would be the sum of integers from 1 to 10, which is 55 bags. His dad wants to know how many bags of trash John would have before the garbage truck arrives. Please code a Python program to input the date the garbage truck comes and print out how many bags of trash John created. Please use a "for" loop in this case.

約翰很少出去倒垃圾，而且垃圾車只在特定日期出現。約翰產生的垃圾袋數量是基於他多久沒有倒垃圾的天數。例如，如果約翰連續 10 天沒有倒垃圾，垃圾袋的數量將從 1 加到 10。結果將是 55 個垃圾袋。他爸爸想知道在垃圾車到來之前，約翰會有多少個垃圾袋。請編寫一個 Python，輸入垃圾車到來的日期，並輸出約翰產生的垃圾袋數量。請在這個案例中使用 for 迴圈。

Input: Days of Garbage car:10 Days of Garbage car:100	Output: There are 55 bags There are 5050 bags

Sample:

```python
# Get user input
garbage_date = int(input("Please enter the date the garbage car will come: "))

# Calculate the number of bags of trash created
num_bags = 0

for day in range(1, garbage_date):
    num_bags += day

# Output the result
print(f"John created {num_bags} bags of trash before the garbage car arrived.")
```

Teacher Instructions:

1. Have students form in groups to discuss the problem, and understand the problem.
2. Have the students write down possible AI prompt require for this class.
3. Have the students check for vocabuary required for this context.
4. Have the students prompt the AI and see if they results are met.
5. Complete the codes to the problem and submitted them to the learnmode along with ai prompt results.

1. 請學生分組討論問題，並理解問題的內容。

2. 請學生寫下可能需要的 AI 提示，以便進行這個課程。

3. 請學生檢查這個情境所需的詞彙。

4. 請學生提示 AI 並檢查結果是否符合要求。

5. 完成問題的程式碼並將其與 AI 提示結果一起提交到學習吧。

Vocabuary

certain 特定 adj.

integer 整數 n.

loop 迴圈 n.

6. Before the class ends, have the group leader to check if the all members in the group have assisted each other and have completed the codes.
課程結束前請小組組長檢查是否所有成員皆已互相協助完成程式

Ai challenge 1	score	Ai challenge 2	score
AI prompt properly AI提示正確	45	AI prompt properly AI提示正確	45
Transition to repl.it 程式轉移至replit	45	Transition to repl.it 程式轉移至replit	45
Teamwork 組內合作	10	Teamwork 組內合作	10

Class 4
1. Have the student prepare the necessary criteria of the work.
2. Brief last class' course and start to have the students working on the second AI challenges.

5min

3. AI challenge 5
AI 挑戰五

35min

Mini game design with 5 recyclable material.

Discuss in groups to create a mini-game where the user identifies the types of 5 different recyclable items. If the user correctly identifies all 5 items, they win the game; otherwise, they lose.

請在小組中討論，製作一個迷你遊戲，讓使用者辨識5種不同可回收物品的類型。如果使用者正確辨識出所有5個物品，則獲勝；否則失敗。

Vocabuary

Recyclable 可回收的 adj.

Material 物品 n.

identify 識別 v.

correctly 正確 adv.

Teacher Instruction

1. Discuss in groups what are the 5 recyclable materials. (English and Chinese together.)
2. Use Chat Everywhere to assist the programming of the code.
3. Modify the prompt and and Answers.
4. Submit Individual work.

1. 分組討論有哪些 5 種可回收物品（英文和中文一起）。
2. 使用 Chat Everywhere 來協助編寫程式碼。
3. 修改提示和答案。
4. 個別提交作業。

Sample prompt:

Please use Python to create a mini-game that asks the user to identify the types of recyclable materials. There are 5 items with 5 categories. If the user categorizes them correctly, they win the game; otherwise, they lose the game.

can the user input to be set into 1 to 5 for easier questions?

Sample results:

```python
# Define the items and their corresponding categories
items = {
    "Plastic bottle": "Plastic",
    "Glass jar": "Glass",
    "Aluminum can": "Metal",
    "Cardboard box": "Paper",
    "Steel tin": "Metal"
}

# Initialize variables for correct and incorrect answers
correct_answers = 0
incorrect_answers = 0

# Iterate through the items and ask the user to categorize them
for item, category in items.items():
    print(f"What category does '{item}' belong to?")
    print("1. Plastic")
    print("2. Glass")
    print("3. Metal")
    print("4. Paper")
    print("5. Other")

    user_choice = int(input("Enter your choice (1-5): "))

    if user_choice == 1 and category == "Plastic":
        print("Correct!")
        correct_answers += 1
    elif user_choice == 2 and category == "Glass":
```

```
        print("Correct!")
        correct_answers += 1
    elif user_choice == 3 and category == "Metal":
        print("Correct!")
        correct_answers += 1
    elif user_choice == 4 and category == "Paper":
        print("Correct!")
        correct_answers += 1
    elif user_choice == 5:
        print("Other category selected.")
        correct_answers += 1
    else:
        print("Incorrect!")
        incorrect_answers += 1

# Determine if the user won or lost the game
if correct_answers == len(items):
    print("Congratulations! You won the game!")
else:
    print("Sorry, you lost the game.")

# Output the user's score
print(f"You categorized {correct_answers} items correctly and {incorrect_answers} i
```

When groups have completed prompting Chat Everywhere, the students need to modify the code into their own code and submit it to the learnmode. 當小組完成了對 Chat Everywhere 的提示後，學生們需要將程式碼修改為他們自己的程式碼，並提交到學習吧中 Summerize the Class. 課程總結 "Using Chat Everywhere can assist users in completing Python programming while learning python syntax; however, a basic understanding of the program is still required to obtain the correct answer for the problem. It is easy to use AI to program, but it is also easy to make mistakes." 使用 Chat Everywhere 可以協助使用者完成 Python 編程並同時學習 python 語法；然而，使用者仍然需要對程式有基本的理解才能獲得正確的答案。使用 AI 進行寫程式很容易，但也容易出錯。	**5min**

參考資料：（若有請列出）

教學心得與省思	依據過去的教學內容上，也提醒學生必須注意以下幾點 1. 請攜帶筆記本，紀錄單字及相關課程用的提示或是程式碼。 2. 雙語教學目的還是在學生學完課程內容，若有遇到學生因語言上所遇到的問題，還是以中文及課程內容為主，然後再引導運用英文來解決問題。 3. 提醒學生專注在問題的思考上，教師是一

	個引導者也是一個提問者。 4. 讓學生知道 AI 的 優點及缺點，將其變成助力上的好工具。 5. 這是第二版本修正
附錄： [Canva 資源](Canva)	