NUS Coding Workshop:

Copilot

Yurui :: Teaching Assistant :: Department of Computer and Engineering

NUS
National University of Singapore
National University of Singapore

© Copyright National University of Singapore. All Rights Reserved.

About me

- Yurui
- Electrical & Computer Engineering
- Freshly graduated from NUS last year 2024
- Full time Teaching Assistant
- Ph.D. Candidate in ML for healthcare

© Copyright National University of Singapore. All Rights Reserved.

Fun Fact about Me #1

- My parents are living in the northern part of China with a super cute Shiba Inu

© Copyright National University of Singapore. All Rights Reserved.

Fun Fact about Me #2

- I worked as a Bartender during Year 1 December Break (circuit breaker)

© Copyright National University of Singapore. All Rights Reserved.

Content Table

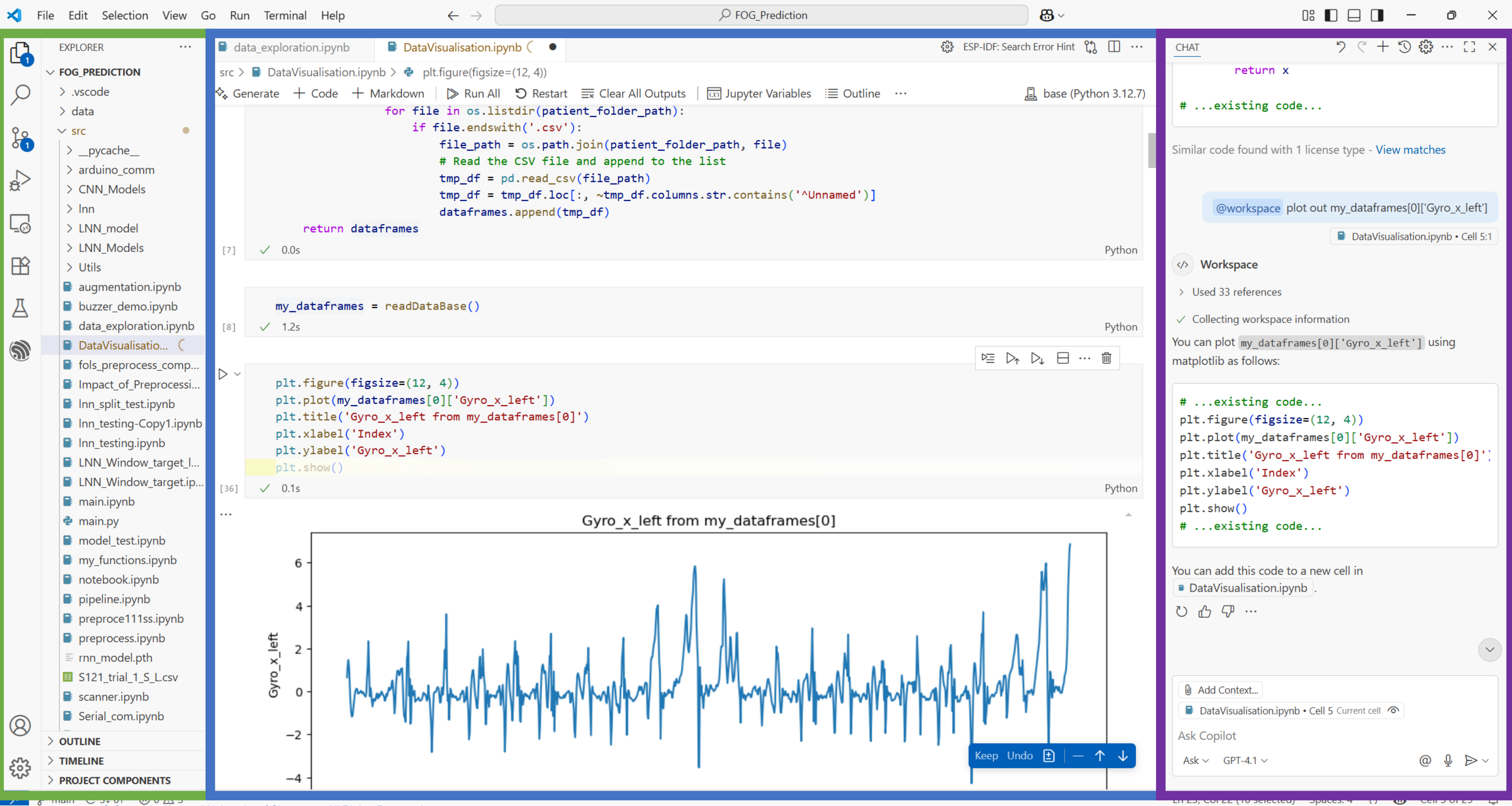
- What is VScode Copilot:
  - Transiting from Command line to IDE to Copilot
  - Install VScode and register GitHub account
- NUS AI Policy
  - DO and DONT
- Features of copilot:
  - Generate code, Fix bug, Create testcases
  - Learn with Copilot
- Hands on activity:
  - Create a HTML dashboard

© Copyright National University of Singapore. All Rights Reserved.

What is VScode Copilot

10 mins

© Copyright National University of Singapore. All Rights Reserved.



```
            for file in os.listdir(patient_folder_path):
                if file.endswith('.csv'):
                    file_path = os.path.join(patient_folder_path, file)
                    # Read the CSV file and append to the list
                    tmp_df = pd.read_csv(file_path)
                    tmp_df = tmp_df.loc[:, ~tmp_df.columns.str.contains('^Unnamed')]
                    dataframes.append(tmp_df)
        return dataframes
```

[7] ✓ 0.0s Python

```
my_dataframes = readDataBase()
```

[8] ✓ 1.2s Python

```
plt.figure(figsize=(12, 4))
plt.plot(my_dataframes[0]['Gyro_x_left'])
plt.title('Gyro_x_left from my_dataframes[0]')
plt.xlabel('Index')
plt.ylabel('Gyro_x_left')
plt.show()
```

[36] ✓ 0.1s Python

```
        return x

# ...existing code...
```

Similar code found with 1 license type - View matches

@workspace plot out my_dataframes[0]['Gyro_x_left']

DataVisualisation.ipynb • Cell 5:1

Workspace

Used 33 references

✓ Collecting workspace information

You can plot `my_dataframes[0]['Gyro_x_left']` using matplotlib as follows:

```
# ...existing code...
plt.figure(figsize=(12, 4))
plt.plot(my_dataframes[0]['Gyro_x_left'])
plt.title('Gyro_x_left from my_dataframes[0]')
plt.xlabel('Index')
plt.ylabel('Gyro_x_left')
plt.show()
# ...existing code...
```

You can add this code to a new cell in DataVisualisation.ipynb.

Files

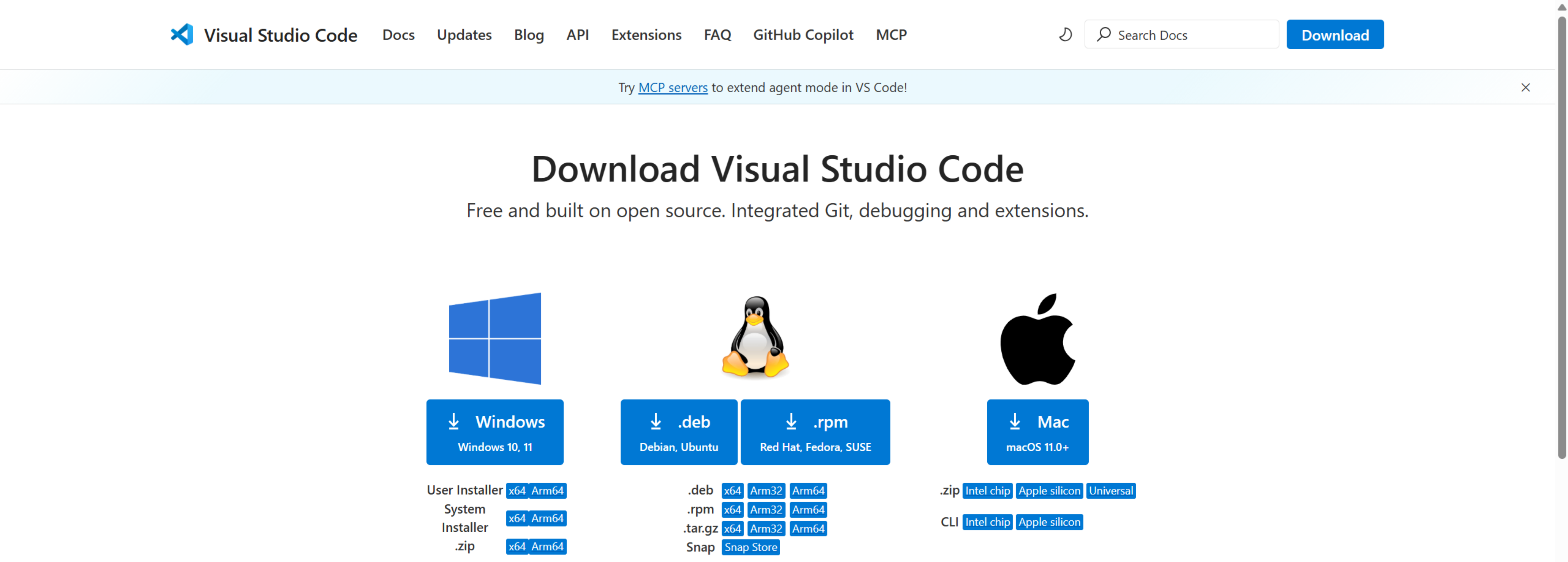
© Copyright National University of Singapore. All Rights Reserved.

Python Notebook

Copilot

Install Visual Studio Code (VScode)

- https://code.visualstudio.com/Download (Just google VScode)



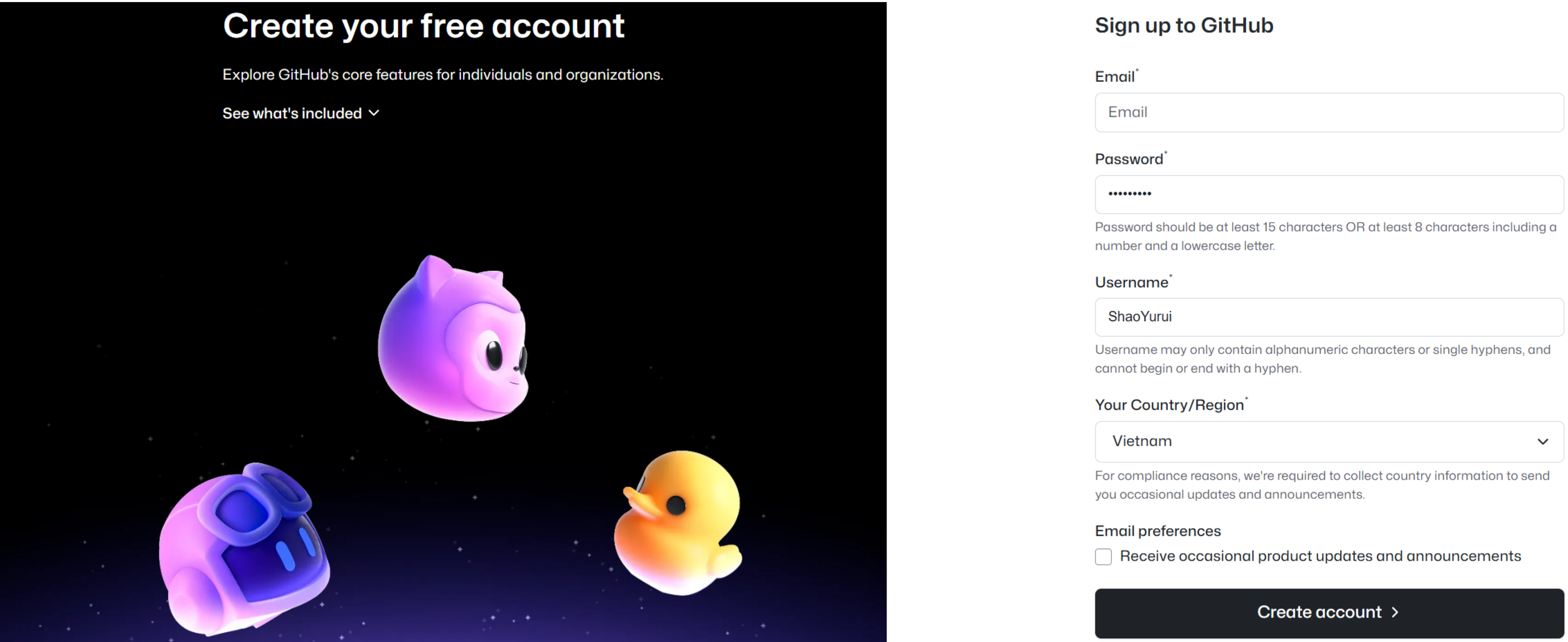
Try MCP servers to extend agent mode in VS Code!

Download Visual Studio Code

Free and built on open source. Integrated Git, debugging and extensions.

Signup GitHub Account

- https://github.com/signup (Just google GitHub)



Create your free account

Explore GitHub's core features for individuals and organizations.

Sign up to GitHub

Email*

Email

Password*

•••••••••

Password should be at least 15 characters OR at least 8 characters including a number and a lowercase letter.

Username*

ShaoYurui

Username may only contain alphanumeric characters or single hyphens, and cannot begin or end with a hyphen.

Your Country/Region*

Vietnam ⌄

For compliance reasons, we're required to collect country information to send you occasional updates and announcements.

Email preferences

☐ Receive occasional product updates and announcements

NUS AI Policy

5 mins

© Copyright National University of Singapore. All Rights Reserved.

NUS AI Policy

- Policy for Use of AI in Teaching & Learning (2024)
https://ctlt.nus.edu.sg/ai-community-of-practice/policies/

- The NUS AI Guidelines for Students can be found as follows:
https://libguides.nus.edu.sg/new2nus/ai_guidelines_infographics

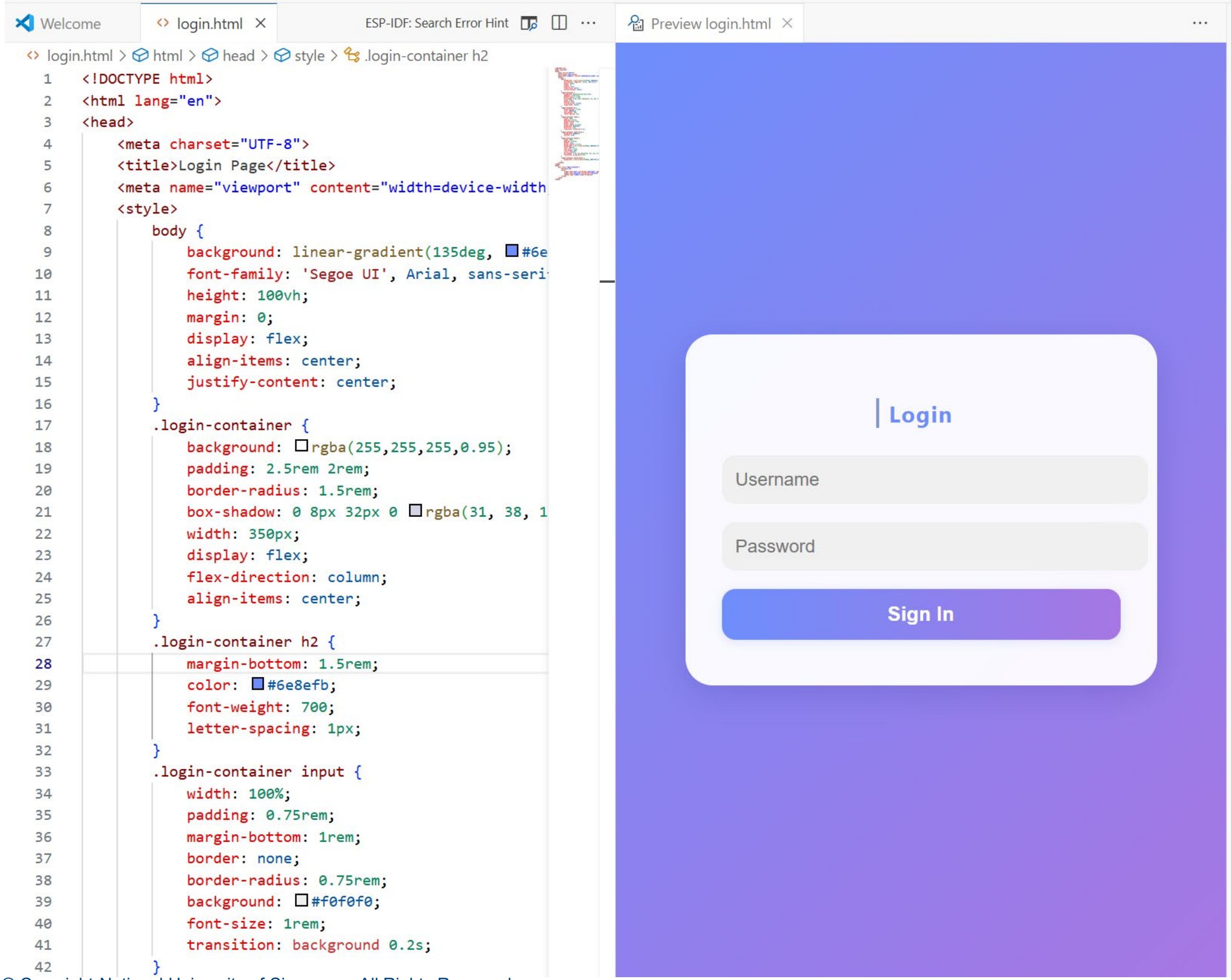
© Copyright National University of Singapore. All Rights Reserved.

Features of Copilot

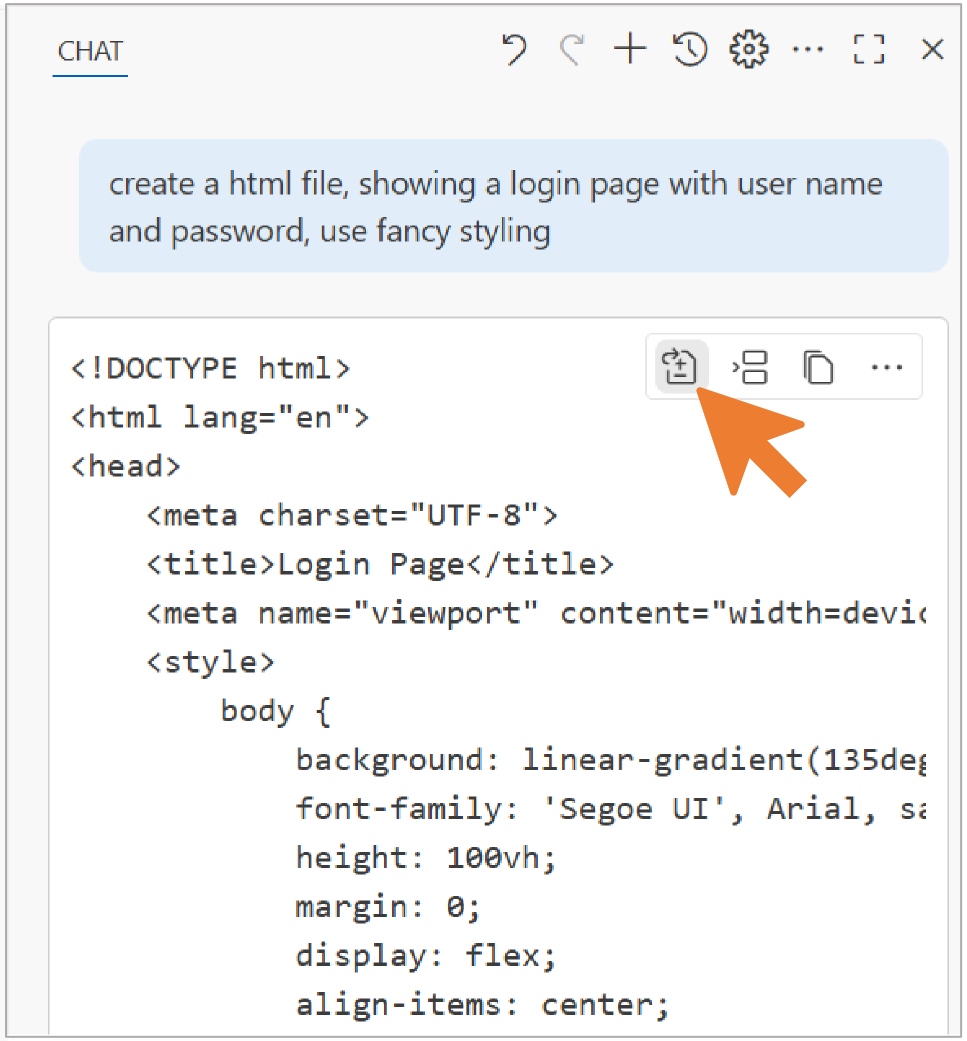
15 mins

© Copyright National University of Singapore. All Rights Reserved.

Generate Code (Demo)


Welcome
login.html
ESP-IDF: Search Error Hint
Preview login.html
login.html > html > head > style > .login-container h2
Login
Username
Password
Sign In

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <title>Login Page</title>
    <meta name="viewport" content="width=device-width
    <style>
        body {
            background: linear-gradient(135deg, #6e
            font-family: 'Segoe UI', Arial, sans-seri
            height: 100vh;
            margin: 0;
            display: flex;
            align-items: center;
            justify-content: center;
        }
        .login-container {
            background: rgba(255,255,255,0.95);
            padding: 2.5rem 2rem;
            border-radius: 1.5rem;
            box-shadow: 0 8px 32px 0 rgba(31, 38, 1
            width: 350px;
            display: flex;
            flex-direction: column;
            align-items: center;
        }
        .login-container h2 {
            margin-bottom: 1.5rem;
            color: #6e8efb;
            font-weight: 700;
            letter-spacing: 1px;
        }
        .login-container input {
            width: 100%;
            padding: 0.75rem;
            margin-bottom: 1rem;
            border: none;
            border-radius: 0.75rem;
            background: #f0f0f0;
            font-size: 1rem;
            transition: background 0.2s;
        }
```

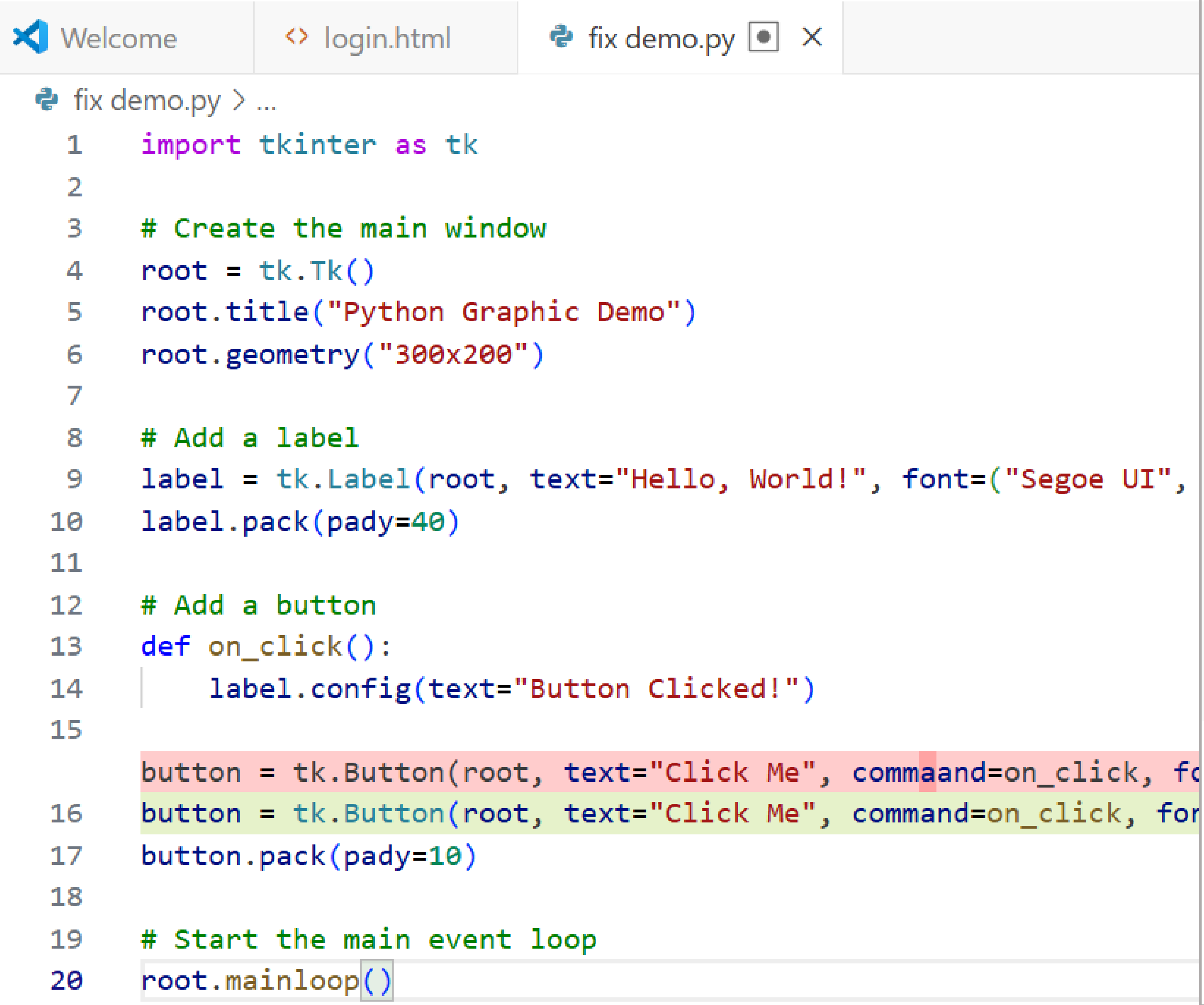


create a html file, showing a login page with user name and password, use fancy styling

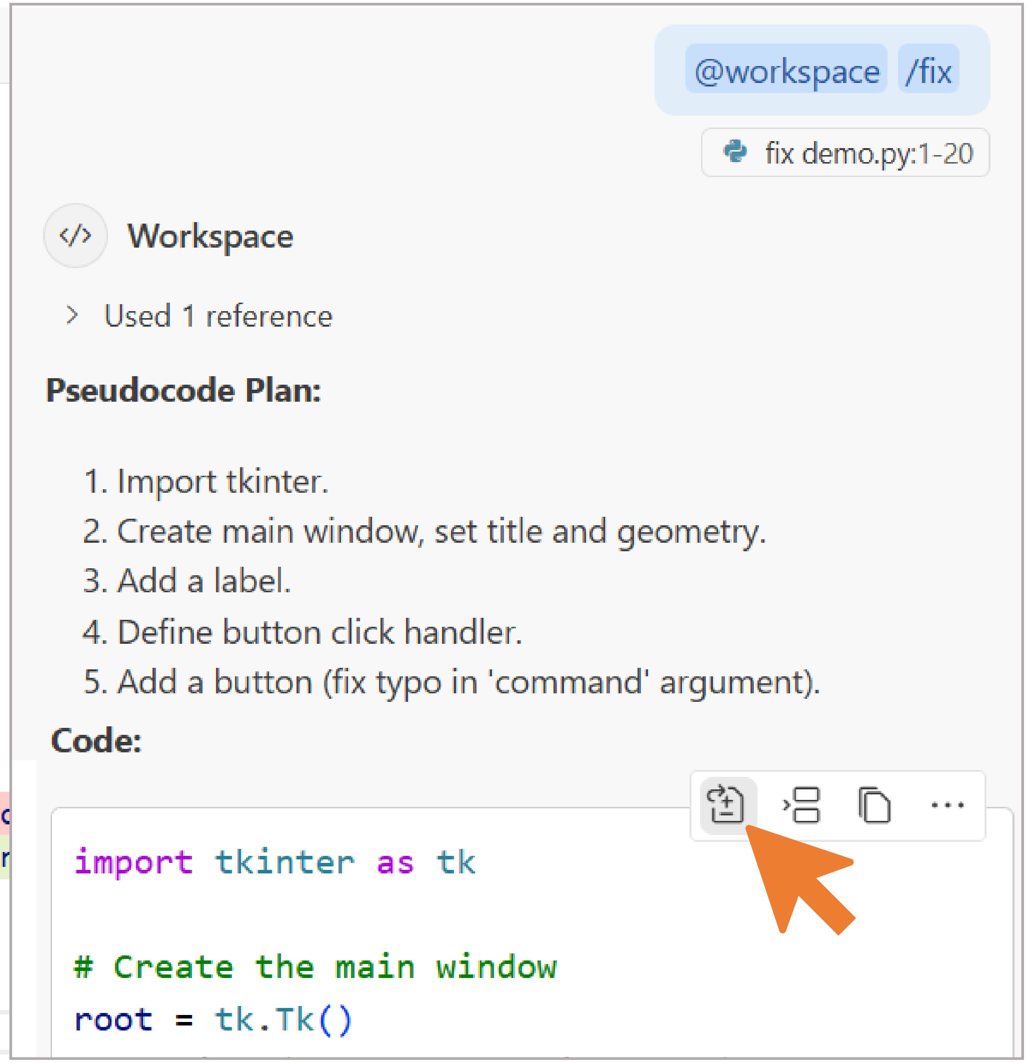
```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <title>Login Page</title>
    <meta name="viewport" content="width=devi
    <style>
        body {
            background: linear-gradient(135de
            font-family: 'Segoe UI', Arial, sa
            height: 100vh;
            margin: 0;
            display: flex;
            align-items: center;
```

© Copyright National University of Singapore. All Rights Reserved.

Fix Bugs (Demo)



```
import tkinter as tk

# Create the main window
root = tk.Tk()
root.title("Python Graphic Demo")
root.geometry("300x200")

# Add a label
label = tk.Label(root, text="Hello, World!", font=("Segoe UI",
label.pack(pady=40)

# Add a button
def on_click():
    label.config(text="Button Clicked!")

button = tk.Button(root, text="Click Me", commaand=on_click, fo
button = tk.Button(root, text="Click Me", command=on_click, for
button.pack(pady=10)

# Start the main event loop
root.mainloop()
```



Pseudocode Plan:

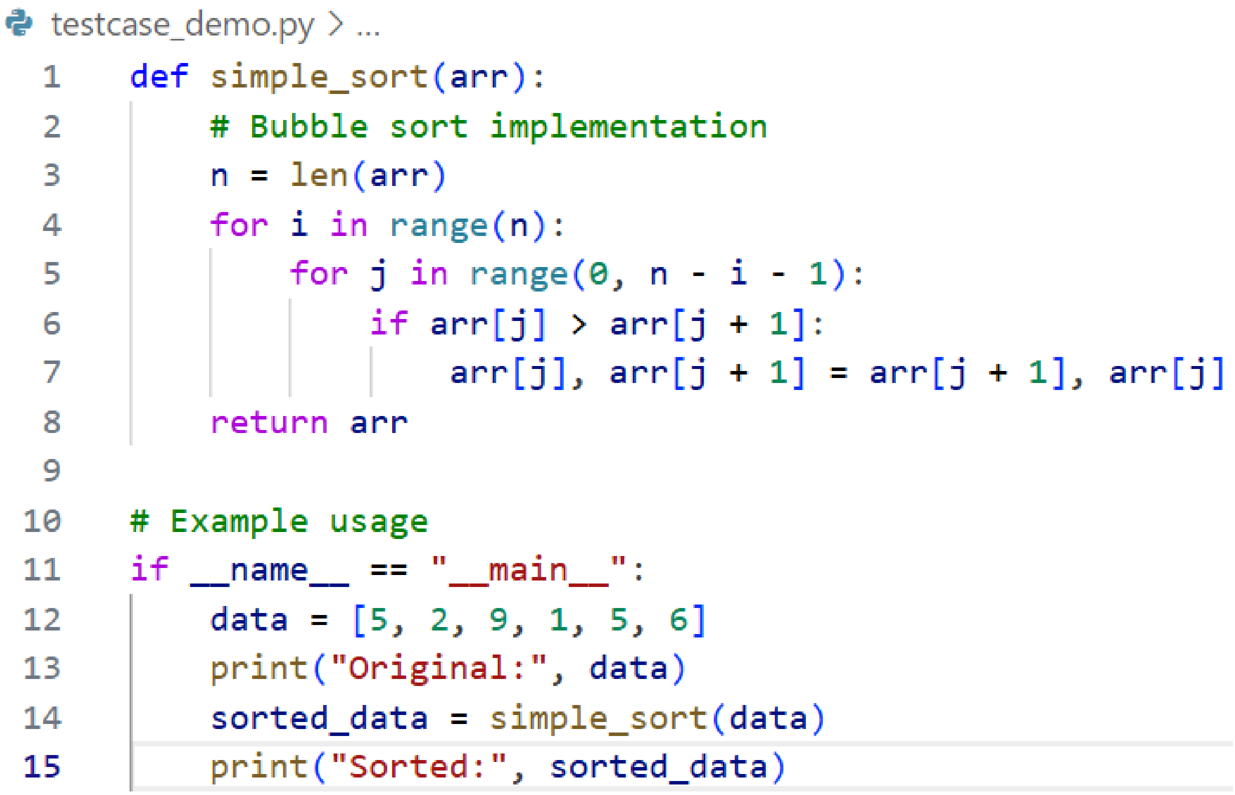
1. Import tkinter.
2. Create main window, set title and geometry.
3. Add a label.
4. Define button click handler.
5. Add a button (fix typo in 'command' argument).

Code:

```
import tkinter as tk

# Create the main window
root = tk.Tk()
```

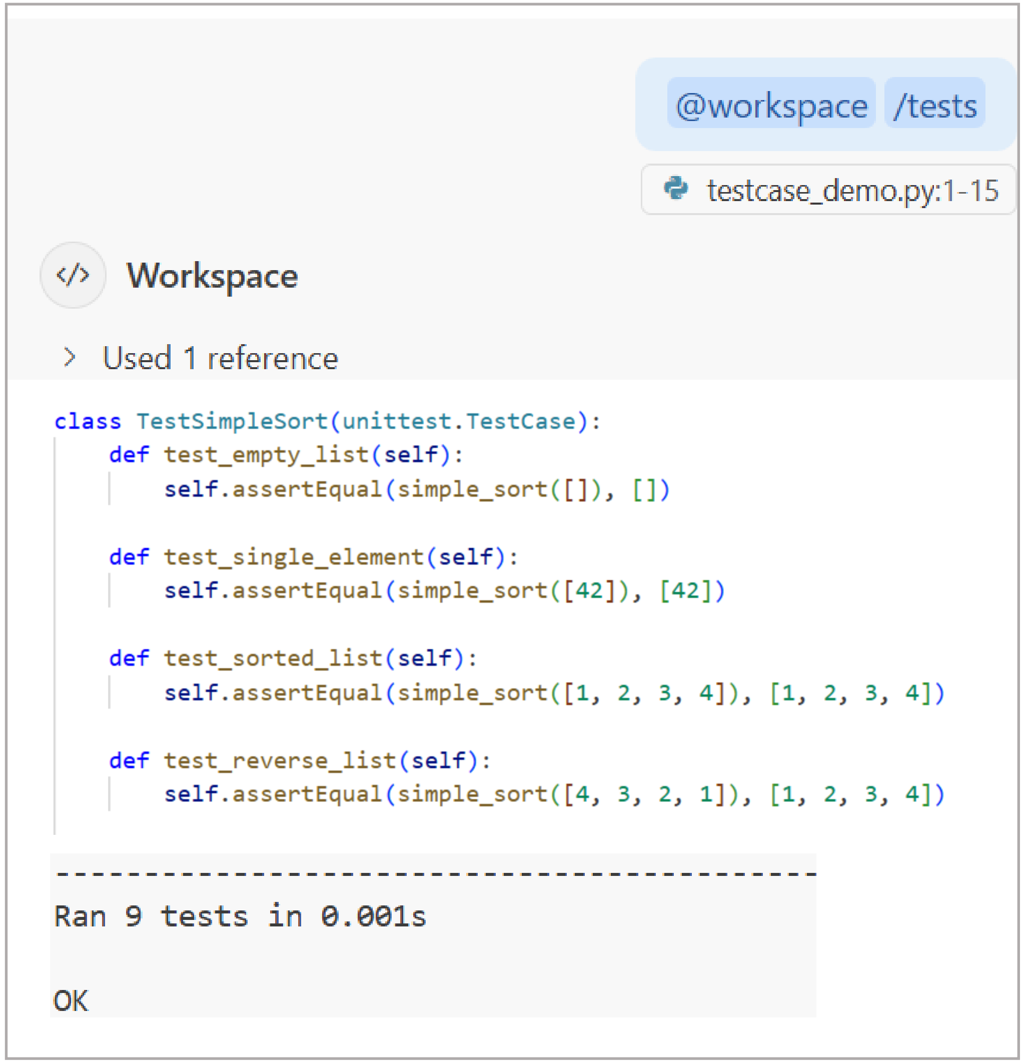
© Copyright National University of Singapore. All Rights Reserved.

Create testcases (Demo)



testcase_demo.py > ...

```python
def simple_sort(arr):
    # Bubble sort implementation
    n = len(arr)
    for i in range(n):
        for j in range(0, n - i - 1):
            if arr[j] > arr[j + 1]:
                arr[j], arr[j + 1] = arr[j + 1], arr[j]
    return arr

# Example usage
if __name__ == "__main__":
    data = [5, 2, 9, 1, 5, 6]
    print("Original:", data)
    sorted_data = simple_sort(data)
    print("Sorted:", sorted_data)
```



@workspace /tests

testcase_demo.py:1-15

Workspace

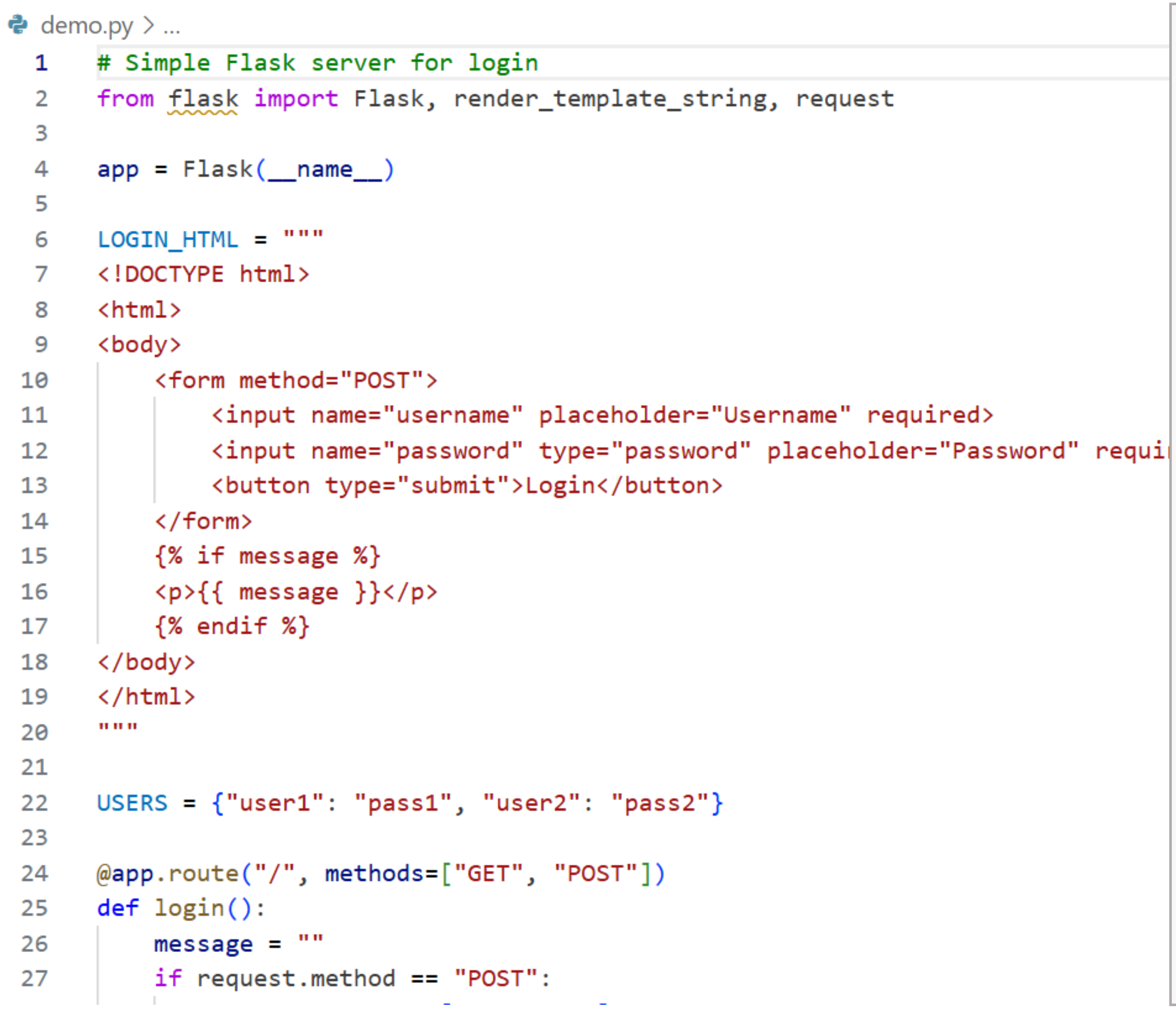
Used 1 reference

```python
class TestSimpleSort(unittest.TestCase):
    def test_empty_list(self):
        self.assertEqual(simple_sort([]), [])

    def test_single_element(self):
        self.assertEqual(simple_sort([42]), [42])

    def test_sorted_list(self):
        self.assertEqual(simple_sort([1, 2, 3, 4]), [1, 2, 3, 4])

    def test_reverse_list(self):
        self.assertEqual(simple_sort([4, 3, 2, 1]), [1, 2, 3, 4])
```

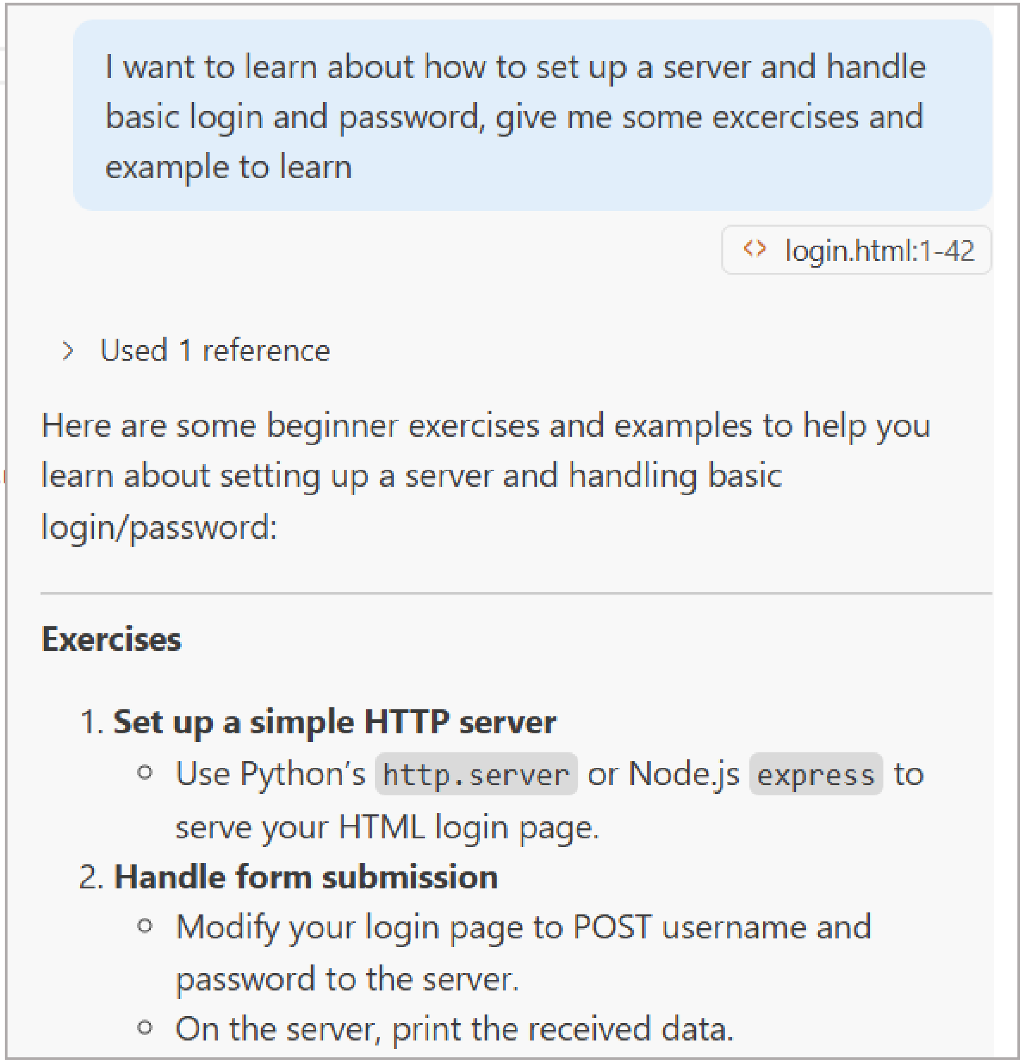
```
----------------------------------------------------------------------
Ran 9 tests in 0.001s

OK
```

© Copyright National University of Singapore. All Rights Reserved.

Learning with Copilot (Demo)



```
# Simple Flask server for login
from flask import Flask, render_template_string, request

app = Flask(__name__)

LOGIN_HTML = """
<!DOCTYPE html>
<html>
<body>
    <form method="POST">
        <input name="username" placeholder="Username" required>
        <input name="password" type="password" placeholder="Password" requi
        <button type="submit">Login</button>
    </form>
    {% if message %}
    <p>{{ message }}</p>
    {% endif %}
</body>
</html>
"""

USERS = {"user1": "pass1", "user2": "pass2"}

@app.route("/", methods=["GET", "POST"])
def login():
    message = ""
    if request.method == "POST":
```



I want to learn about how to set up a server and handle basic login and password, give me some excercises and example to learn

Here are some beginner exercises and examples to help you learn about setting up a server and handling basic login/password:

Exercises

1. **Set up a simple HTTP server**
    - Use Python's `http.server` or Node.js `express` to serve your HTML login page.
2. **Handle form submission**
    - Modify your login page to POST username and password to the server.
    - On the server, print the received data.

© Copyright National University of Singapore. All Rights Reserved.

Summary

- Slash Command
  - \fix
  - \tests
- Context
  - VScode
  - Workspace
- Additional Resources
  - Get Started with GitHub Copilot in VS Code (2025) https://www.youtube.com/watch?v=vdBxfFVXnc0&t=625s
  - Copilot Best Practices (What Not To Do) https://www.youtube.com/watch?v=2q0BoioYSxQ

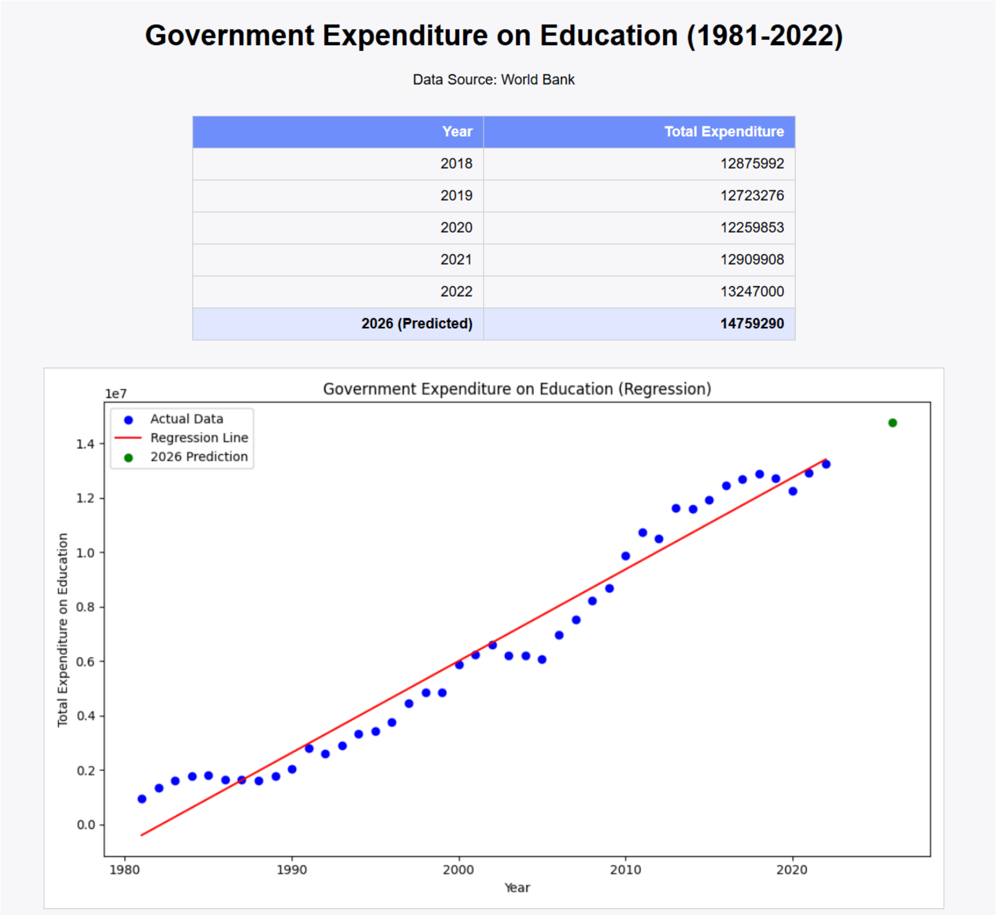
© Copyright National University of Singapore. All Rights Reserved.

Hands on Activity

15 mins

© Copyright National University of Singapore. All Rights Reserved.

DIY



Government Expenditure on Education (1981-2022)

Data Source: World Bank

Year	Total Expenditure
2018	12875992
2019	12723276
2020	12259853
2021	12909908
2022	13247000
2026 (Predicted)	**14759290**

Create a HTML dashboard

- Contains a table
- Display a regression line
- Predict 2026 expenditure

© Copyright National University of Singapore. All Rights Reserved.

Thank YOU

© Copyright National University of Singapore. All Rights Reserved.