Lab 5: Ethical Foundations – Responsible AI Coding Practices

Week 3 – Monday

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Lab Objectives

- To understand ethical risks involved in AI-generated code.
- To identify issues related to privacy, security, and transparency.
- To analyze the responsibility of developers when using AI tools.
- To promote responsible and ethical AI coding practices.

Lab Outcomes

After completing this lab, students will be able to:

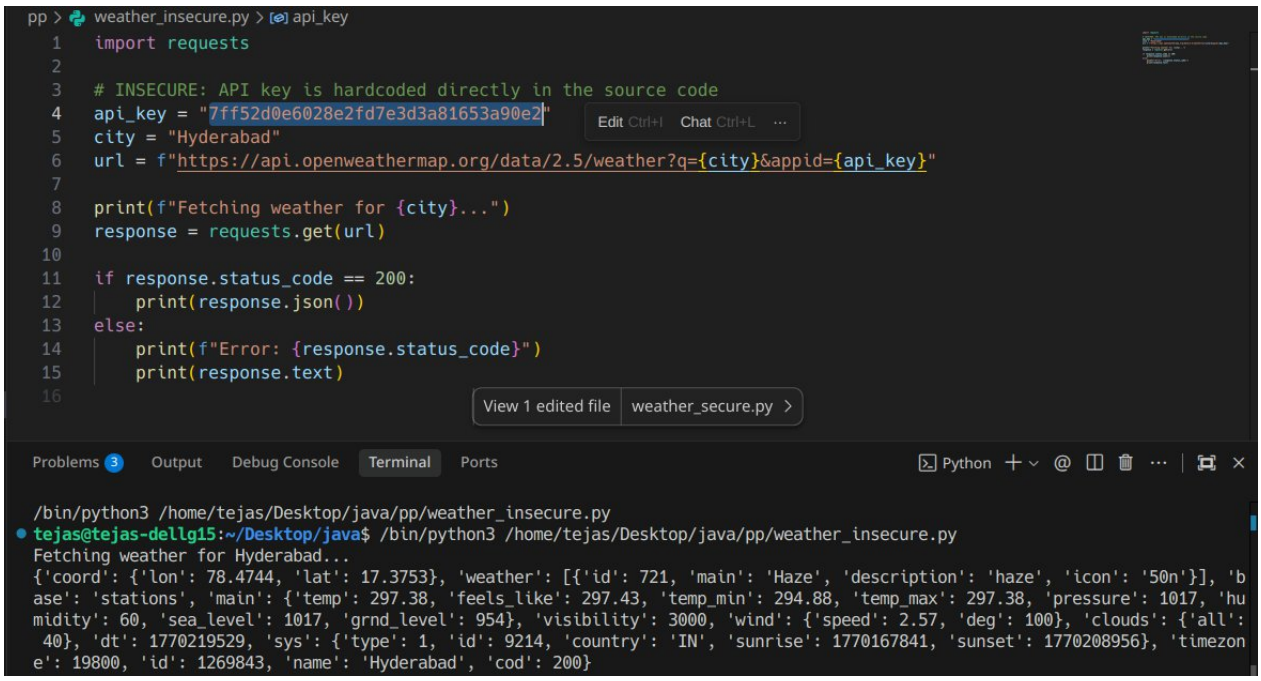
- Identify insecure coding patterns generated by AI tools.
- Analyze privacy and security risks in AI-generated programs.
- Understand the importance of transparency and explainability.
- Recognize the role of human responsibility in ethical AI coding.

Task Description #1: Privacy in API Usage

Objective:
To generate a Python program that fetches weather data securely without exposing API keys.

Risk Analysis:
AI-generated code may hardcode API keys directly in the program. This is unsafe and may lead to security breaches.

Conclusion:
Using environment variables protects sensitive credentials and follows ethical security practices.



Task Description #2: Privacy & Security in File Handling

Objective:
To analyze how AI-generated code stores user data and improve its security.

Privacy Risk Identified:
Storing passwords in plain text can compromise user accounts.

Conclusion:
Hashing passwords ensures data privacy and security.

main.py

Share Run

```python
import hashlib

name = "John"
email = "john@example.com"
password = "mypassword"

hashed_password = hashlib.sha256(password.encode()).hexdigest()

print("Name:", name)
print("Email:", email)
print("Password Hash:", hashed_password)
print("User data stored securely (simulation).")

```

Output

Clear

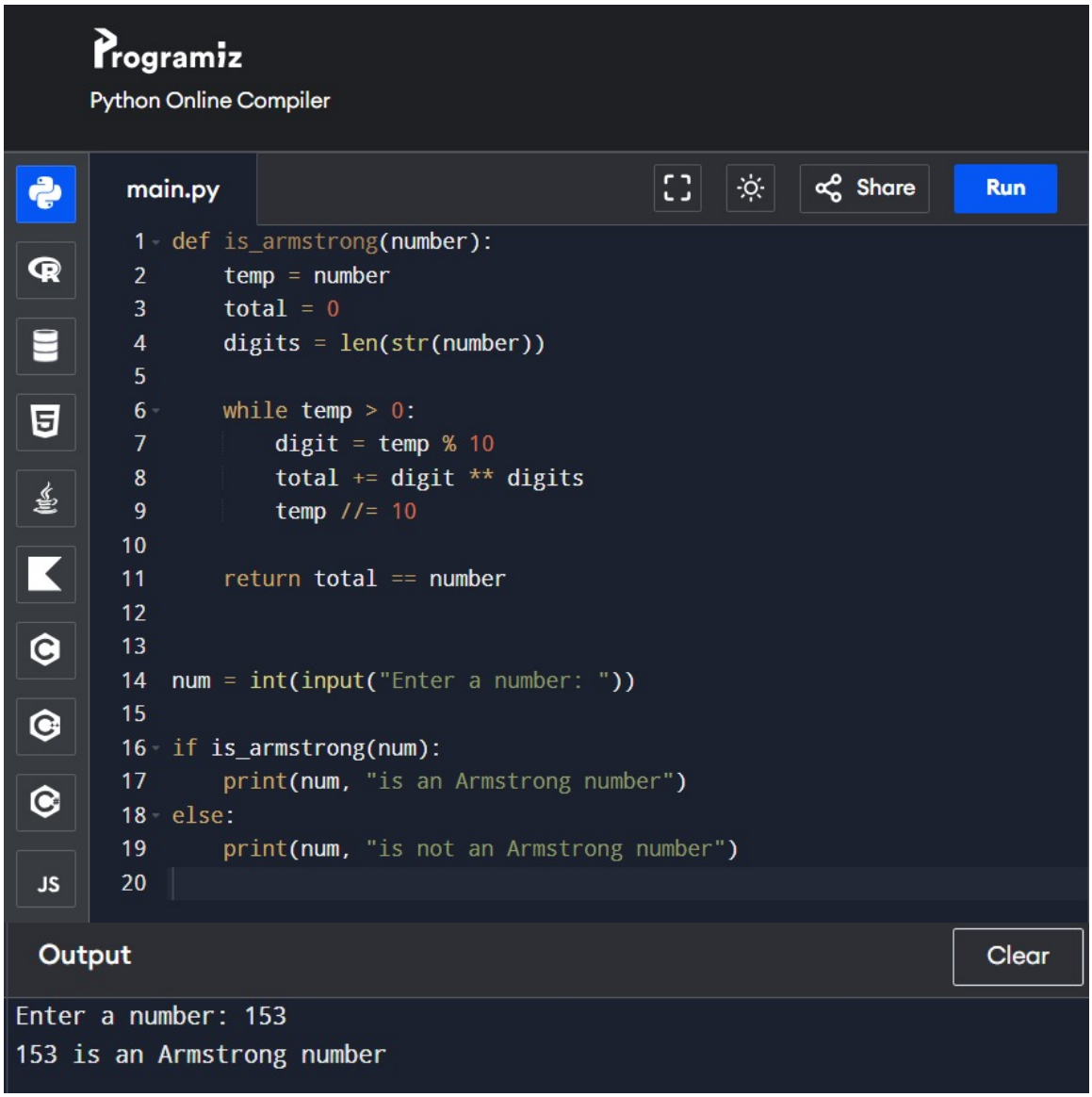
```
Name: John
Email: john@example.com
Password Hash: 89e01536ac207279409d4de1e5253e01f4a1769e696db0d6062ca9b8f5676
    7c8
User data stored securely (simulation).
```

Task Description #3: Transparency in Algorithm Design

Objective:
To create an Armstrong number checking program with clear explanation.

Explanation:
The program checks whether the sum of digits raised to the power of total digits equals the original number.

Conclusion:
The logic is simple, transparent, and easy to understand.

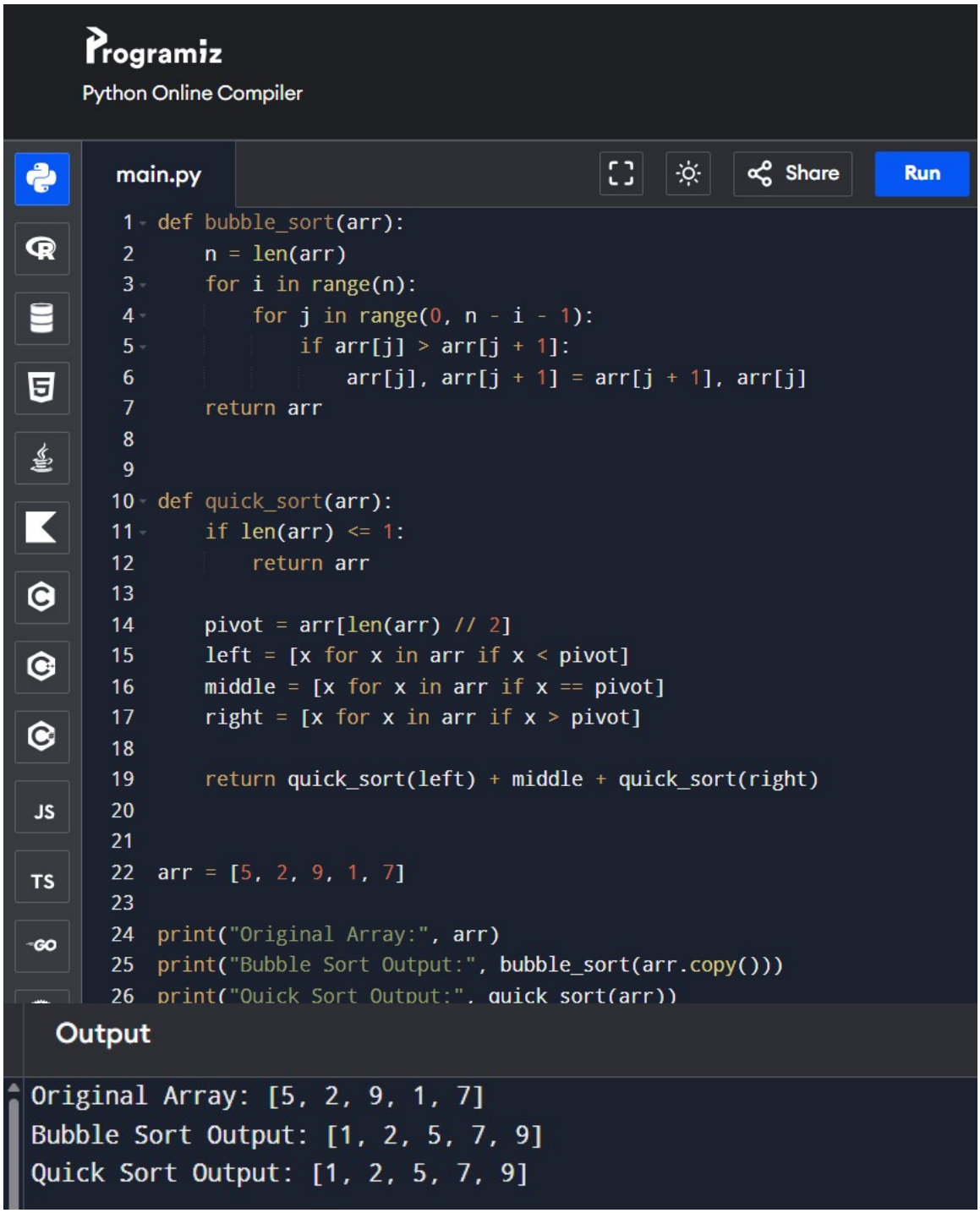


Task Description #4: Transparency in Algorithm Comparison

Objective:
To implement and compare Bubble Sort and Quick Sort algorithms.

Explanation:
Bubble Sort is easy to understand but slow, whereas Quick Sort is faster and efficient for large datasets.

Conclusion:
Choosing the right algorithm improves performance and ethical decision-making.

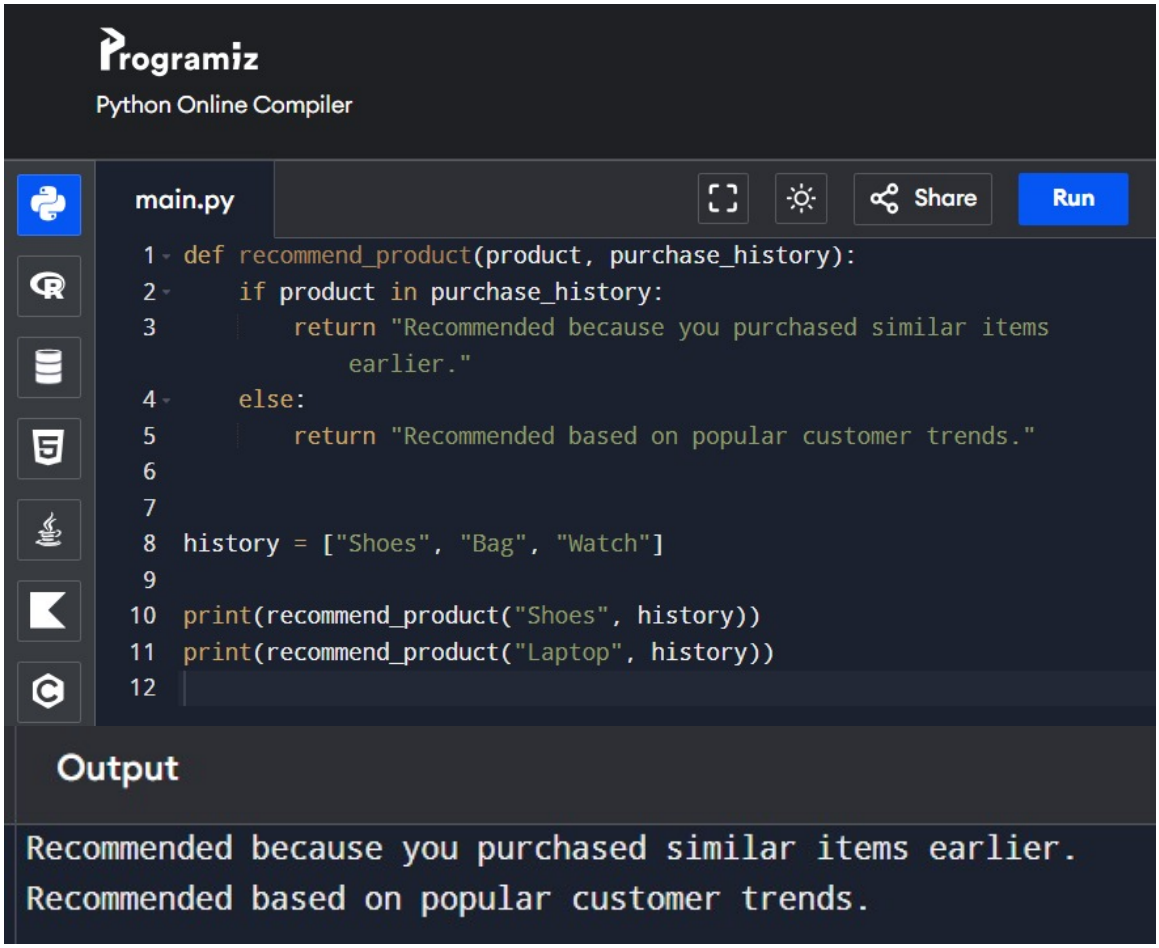


Task Description #5: Transparency in AI Recommendations

Objective:
To build a recommendation system that explains why items are suggested.

Explanation:
Providing reasons for recommendations improves transparency and trust.

Conclusion:
Explainable AI systems are more ethical and user-friendly.



Overall Reflection

This lab emphasizes that AI tools assist developers, but ethical responsibility lies with humans. Ensuring security, privacy, and transparency is essential in responsible AI coding.