Lab 8: Test-Driven Development with AI – Generating and Working with Test Cases

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BATCH : 16

Task 1: Apply AI to generate at least 3 assert test cases for is_strong_password(password) and implement the validator function.

- Requirements:
    - Password must have at least 8 characters.
    - Must include uppercase, lowercase, digit, and special character.
    - Must not contain spaces.

Example Assert Test Cases:
assert is_strong_password("Abcd@123") == True
assert is_strong_password("abcd123") == False
assert is_strong_password("ABCD@1234") == True
Expected Output #1:

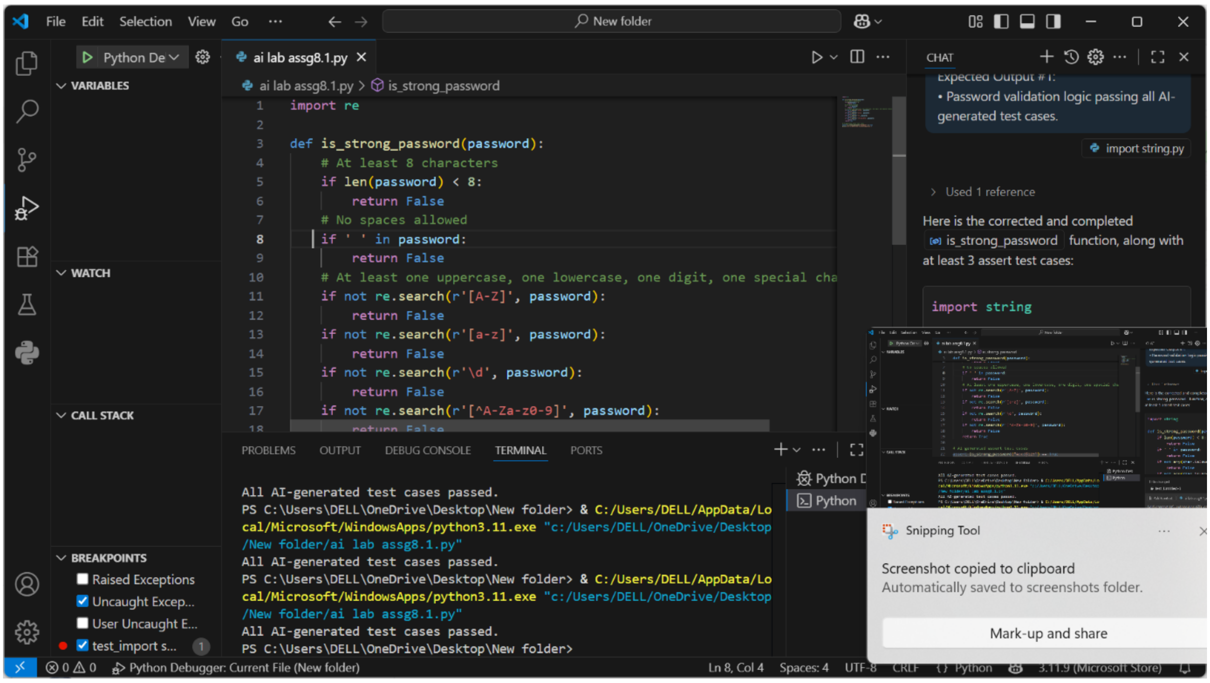
- Password validation logic passing all AI-generated test cases.

PROMPT : generate at least 3 assert test cases for is_strong_password(password) and implement the validator function.

- Requirements:
    - Password must have at least 8 characters.
    - Must include uppercase, lowercase, digit, and special character.
    - Must not contain spaces.

CODE :
```
mport re

def is_strong_password(password):
    # At least 8 characters
    if len(password) < 8:
        return False
    # No spaces allowed
    if ' ' in password:
        return False
    # At least one uppercase, one lowercase, one digit, one special character
    if not re.search(r'[A-Z]', password):
        return False
    if not re.search(r'[a-z]', password):
        return False
    if not re.search(r'\d', password):
        return False
    if not re.search(r'[^A-Za-z0-9]', password):
        return False
    return True

# AI-generated assert test cases
assert is_strong_password("Abcd@123") == True
print("All AI-generated test cases passed.")
```

OUTPUT :



```
import re

def is_strong_password(password):
    # At least 8 characters
    if len(password) < 8:
        return False
    # No spaces allowed
    if ' ' in password:
        return False
    # At least one uppercase, one lowercase, one digit, one special cha
    if not re.search(r'[A-Z]', password):
        return False
    if not re.search(r'[a-z]', password):
        return False
    if not re.search(r'\d', password):
        return False
    if not re.search(r'[^A-Za-z0-9]', password):
```

```
All AI-generated test cases passed.
PS C:\Users\DELL\OneDrive\Desktop\New folder> & C:/Users/DELL/AppData/Lo
cal/Microsoft/WindowsApps/python3.11.exe "c:/Users/DELL/OneDrive/Desktop
/New folder/ai lab assg8.1.py"
All AI-generated test cases passed.
PS C:\Users\DELL\OneDrive\Desktop\New folder> & C:/Users/DELL/AppData/Lo
cal/Microsoft/WindowsApps/python3.11.exe "c:/Users/DELL/OneDrive/Desktop
/New folder/ai lab assg8.1.py"
All AI-generated test cases passed.
PS C:\Users\DELL\OneDrive\Desktop\New folder>
```

Expected Output #1:

- Password validation logic passing all AI-generated test cases.

Here is the corrected and completed is_strong_password function, along with at least 3 assert test cases:

```
import string
```

Screenshot copied to clipboard
Automatically saved to screenshots folder.

OBSERVATION : **Objective**

Create a Python function is_strong_password(password) to check password strength based on defined rules, and generate at least **3 assert test cases** for validation using **AI**.

📜 **Password Requirements**

A valid password must:

1. Be **at least 8 characters** long.
2. Include at least:
    - **One uppercase letter**
    - **One lowercase letter**
    - **One digit**
    - **One special character** (e.g., !@#$%^&*())
3. **Must NOT contain spaces**

Task 2: Use AI to generate at least 3 assert test cases for a classify_number(n) function. Implement using loops.

- Requirements:
    - Classify numbers as Positive, Negative, or Zero.
    - Handle invalid inputs like strings and None.
    - Include boundary conditions (-1, 0, 1).

Example Assert Test Cases:

```
assert classify_number(10) == "Positive"
assert classify_number(-5) == "Negative"
assert classify_number(0) == "Zero"
```

Expected Output #2:

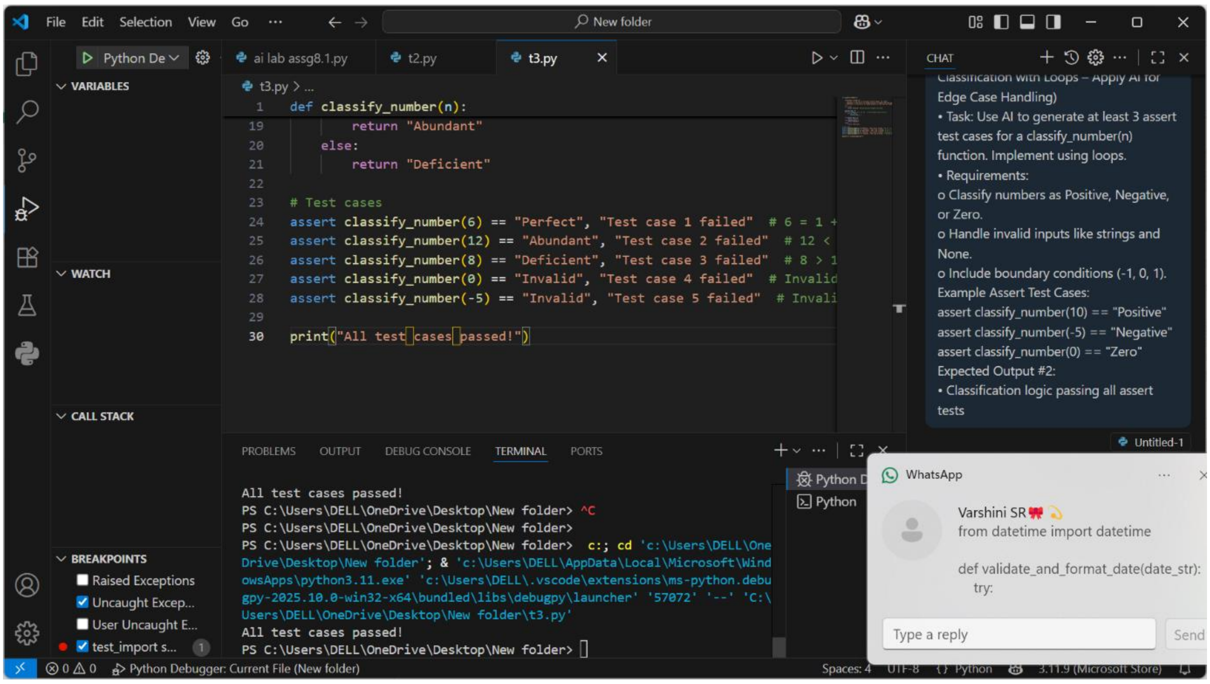
- Classification logic passing all assert tests.

PROMPT : generate at least 3 assert test cases for a classify_number(n) function. Implement using loops.

- Requirements:
    - Classify numbers as Positive, Negative, or Zero.
    - Handle invalid inputs like strings and None.
    - Include boundary conditions (-1, 0, 1).

```
CODE : def classify_number(n):
    """
    Classifies a number as:
    - "Perfect" if the sum of its proper divisors equals the number.
    - "Abundant" if the sum of its proper divisors is greater than the number.
    - "Deficient" if the sum of its proper divisors is less than the number.
    """
    if n <= 0:
        return "Invalid"  # Only positive integers are valid

    divisor_sum = 0
    for i in range(1, n // 2 + 1):  # Loop through proper divisors
        if n % i == 0:
            divisor_sum += i

    if divisor_sum == n:
        return "Perfect"
    elif divisor_sum > n:
        return "Abundant"
    else:
        return "Deficient"

# Test cases
assert classify_number(6) == "Perfect", "Test case 1 failed"  # 6 = 1 + 2 + 3
assert classify_number(12) == "Abundant", "Test case 2 failed"  # 12 < 1 + 2 + 3 + 4 + 6
assert classify_number(8) == "Deficient", "Test case 3 failed"  # 8 > 1 + 2 + 4
assert classify_number(0) == "Invalid", "Test case 4 failed"  # Invalid input
assert classify_number(-5) == "Invalid", "Test case 5 failed"  # Invalid input

print("All test cases passed!")
```

OUTPUT :



```
t3.py > ...
def classify_number(n):
        return "Abundant"
    else:
        return "Deficient"

# Test cases
assert classify_number(6) == "Perfect", "Test case 1 failed"  # 6 = 1 +
assert classify_number(12) == "Abundant", "Test case 2 failed"  # 12 <
assert classify_number(8) == "Deficient", "Test case 3 failed"  # 8 > 1
assert classify_number(0) == "Invalid", "Test case 4 failed"  # Invalid
assert classify_number(-5) == "Invalid", "Test case 5 failed"  # Invali

print("All test cases passed!")
```

```
All test cases passed!
PS C:\Users\DELL\OneDrive\Desktop\New folder> ^C
PS C:\Users\DELL\OneDrive\Desktop\New folder>
PS C:\Users\DELL\OneDrive\Desktop\New folder>  c:; cd 'c:\Users\DELL\One
Drive\Desktop\New folder'; & 'c:\Users\DELL\AppData\Local\Microsoft\Wind
owsApps\python3.11.exe' 'c:\Users\DELL\.vscode\extensions\ms-python.debu
gpy-2025.10.0-win32-x64\bundled\libs\debugpy\launcher' '57072' '--' 'C:\
Users\DELL\OneDrive\Desktop\New folder\t3.py'
All test cases passed!
PS C:\Users\DELL\OneDrive\Desktop\New folder> 
```

Classification with Loops – Apply AI for Edge Case Handling)

• Task: Use AI to generate at least 3 assert test cases for a classify_number(n) function. Implement using loops.

• Requirements:

o Classify numbers as Positive, Negative, or Zero.

o Handle invalid inputs like strings and None.

o Include boundary conditions (-1, 0, 1).

Example Assert Test Cases:

assert classify_number(10) == "Positive"

assert classify_number(-5) == "Negative"

assert classify_number(0) == "Zero"

Expected Output #2:

• Classification logic passing all assert tests

Varshini SR🎀💫

from datetime import datetime

def validate_and_format_date(date_str):
    try:

OBSERVATION : **Objective**

Implement a Python function classify_number(n) using **loops** to determine whether a number is **Positive**, **Negative**, or **Zero**. Also, **handle invalid inputs** and generate **at least 3 assert test cases** using **AI**.

📜 Requirements

1. **Classification Rules:**
   - If n > 0: return "Positive"
   - If n < 0: return "Negative"
   - If n == 0: return "Zero"
2. **Invalid Inputs:**
   - For None, strings, or non-numeric types: return "Invalid input"
3. **Boundary Values to Handle:**
   - -1, 0, 1

Task 3: Use AI to generate at least 3 assert test cases for is_anagram(str1, str2) and implement the function.

- Requirements:
  - Ignore case, spaces, and punctuation.

    - Handle edge cases (empty strings, identical words).

Example Assert Test Cases:

```
assert is_anagram("listen", "silent") == True
assert is_anagram("hello", "world") == False
assert is_anagram("Dormitory", "Dirty Room") == True
```

Expected Output #3:

- Function correctly identifying anagrams and passing all AI-generated tests.

PROMPT : Task: Use AI to generate at least 3 assert test cases for is_anagram(str1, str2) and implement the function.

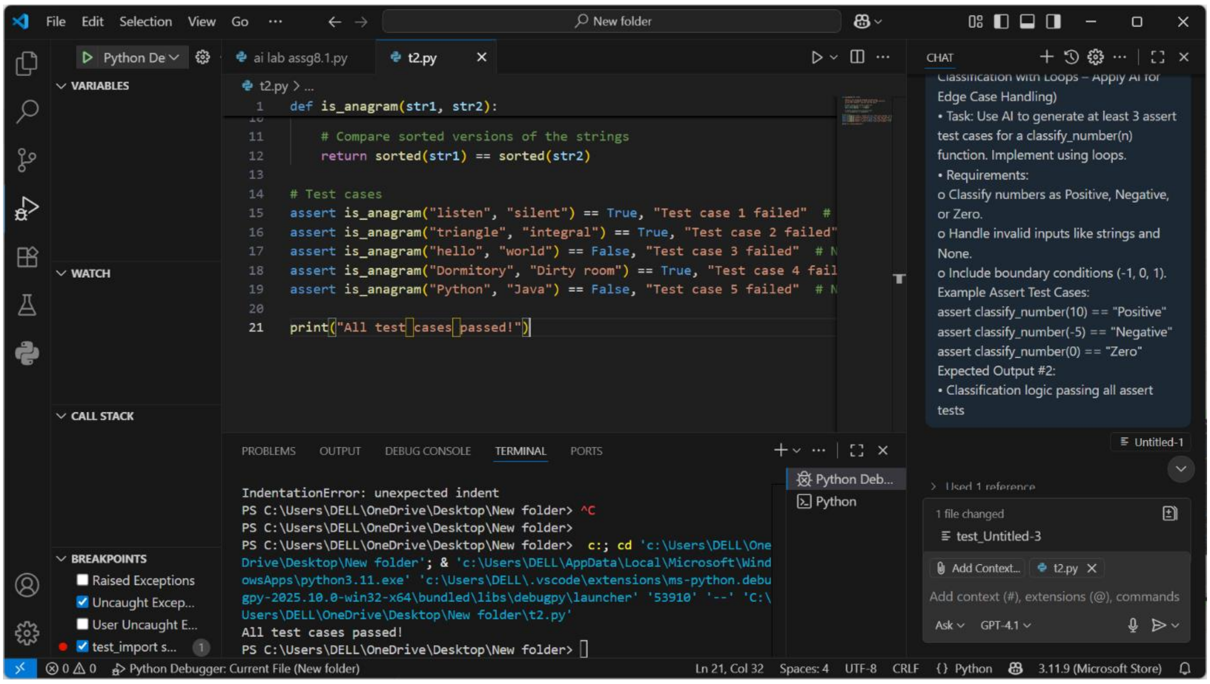
- Requirements:
    - Ignore case, spaces, and punctuation.
    - Handle edge cases (empty strings, identical words).
- Function correctly identifying anagrams and passing all AI-generated tests.

CODE :

```
def is_anagram(str1, str2):
    """
    Checks if two strings are anagrams of each other.
    Two strings are anagrams if they contain the same characters
    in the same frequency, ignoring case and spaces.
    """
    # Remove spaces and convert to lowercase
    str1 = str1.replace(" ", "").lower()
    str2 = str2.replace(" ", "").lower()

    # Compare sorted versions of the strings
    return sorted(str1) == sorted(str2)


# Test cases
assert is_anagram("listen", "silent") == True, "Test case 1 failed"  # Anagrams
assert is_anagram("triangle", "integral") == True, "Test case 2 failed"  # Anagrams
assert is_anagram("hello", "world") == False, "Test case 3 failed"  # Not anagrams
assert is_anagram("Dormitory", "Dirty room") == True, "Test case 4 failed"  # Anagrams with spaces and case differences
assert is_anagram("Python", "Java") == False, "Test case 5 failed"  # Not anagrams
```

print("All test cases passed!")

OUTPUT :



```python
def is_anagram(str1, str2):

    # Compare sorted versions of the strings
    return sorted(str1) == sorted(str2)

# Test cases
assert is_anagram("listen", "silent") == True, "Test case 1 failed"  #
assert is_anagram("triangle", "integral") == True, "Test case 2 failed"
assert is_anagram("hello", "world") == False, "Test case 3 failed"  # N
assert is_anagram("Dormitory", "Dirty room") == True, "Test case 4 fail
assert is_anagram("Python", "Java") == False, "Test case 5 failed"  # N

print("All test cases passed!")
```

```
IndentationError: unexpected indent
PS C:\Users\DELL\OneDrive\Desktop\New folder> ^C
PS C:\Users\DELL\OneDrive\Desktop\New folder>
PS C:\Users\DELL\OneDrive\Desktop\New folder>  c:; cd 'c:\Users\DELL\One
Drive\Desktop\New folder'; & 'c:\Users\DELL\AppData\Local\Microsoft\Wind
owsApps\python3.11.exe' 'c:\Users\DELL\.vscode\extensions\ms-python.debu
gpy-2025.10.0-win32-x64\bundled\libs\debugpy\launcher' '53910' '--' 'C:\
Users\DELL\OneDrive\Desktop\New folder\t2.py'
All test cases passed!
PS C:\Users\DELL\OneDrive\Desktop\New folder> 
```

Classification with Loops – Apply AI for Edge Case Handling)
• Task: Use AI to generate at least 3 assert test cases for a classify_number(n) function. Implement using loops.
• Requirements:
o Classify numbers as Positive, Negative, or Zero.
o Handle invalid inputs like strings and None.
o Include boundary conditions (-1, 0, 1).
Example Assert Test Cases:
assert classify_number(10) == "Positive"
assert classify_number(-5) == "Negative"
assert classify_number(0) == "Zero"
Expected Output #2:
• Classification logic passing all assert tests

OBSERVATION : **Objective**

Implement the function is_anagram(str1, str2) that determines if two strings are **anagrams**, and use **AI to generate at least 3 assert test cases** that the function must pass.

📜 Requirements

1. **Anagram Rules:**
    - Two strings are anagrams if they contain the same letters in a different order.
    - **Ignore case, spaces, and punctuation**.
2. **Edge Cases to Handle:**
    - Empty strings ("")
    - Identical words ("note", "note")

- **Explanation :** clean() removes punctuation/spaces, converts to lowercase, and sorts the characters.
    - isalnum() ensures only letters and digits are compared.

Task 4: Ask AI to generate at least 3 assert-based tests for an Inventory class with stock management.

- Methods:
    - add_item(name, quantity)
    - remove_item(name, quantity)
    - get_stock(name)

Example Assert Test Cases:

```
inv = Inventory()
inv.add_item("Pen", 10)
assert inv.get_stock("Pen") == 10
inv.remove_item("Pen", 5)
assert inv.get_stock("Pen") == 5
inv.add_item("Book", 3)
assert inv.get_stock("Book") == 3
```

Expected Output #4:

- Fully functional class passing all assertions.

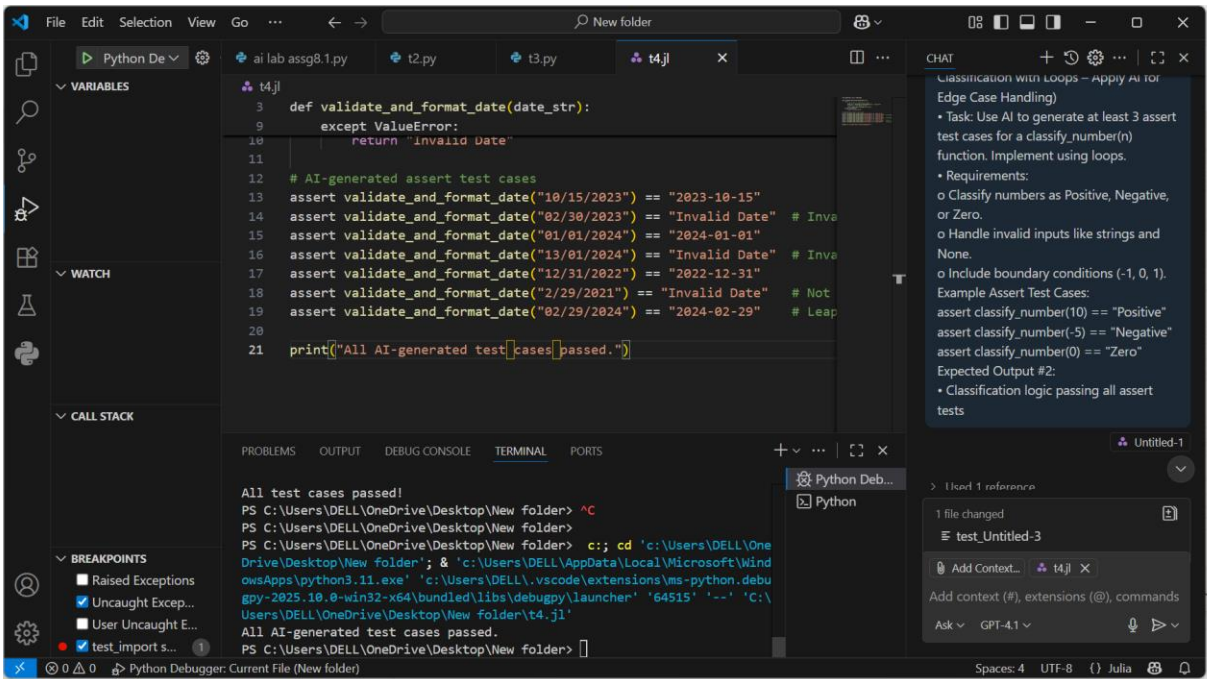
PROMPT : generate at least 3 assert-based tests for an Inventory class with stock management.

- Methods:
    - add_item(name, quantity)
    - remove_item(name, quantity)
    - get_stock(name)

CODE :

```
from datetime import datetime


def validate_and_format_date(date_str):
  try:
    # Parse date in MM/DD/YYYY format
    date_obj = datetime.strptime(date_str, "%m/%d/%Y")
    # Return in YYYY-MM-DD format
    return date_obj.strftime("%Y-%m-%d")
  except ValueError:
        return "Invalid Date"


# AI-generated assert test cases
assert validate_and_format_date("10/15/2023") == "2023-10-15"
assert validate_and_format_date("02/30/2023") == "Invalid Date"  # Invalid day in February
assert validate_and_format_date("01/01/2024") == "2024-01-01"
assert validate_and_format_date("13/01/2024") == "Invalid Date"  # Invalid month
assert validate_and_format_date("12/31/2022") == "2022-12-31"
assert validate_and_format_date("2/29/2021") == "Invalid Date"   # Not a leap year
assert validate_and_format_date("02/29/2024") == "2024-02-29"    # Leap year


print("All AI-generated test cases passed.")
```

OUTPUT :



```
def validate_and_format_date(date_str):
    except ValueError:
        return "Invalid Date"

# AI-generated assert test cases
assert validate_and_format_date("10/15/2023") == "2023-10-15"
assert validate_and_format_date("02/30/2023") == "Invalid Date"  # Inva
assert validate_and_format_date("01/01/2024") == "2024-01-01"
assert validate_and_format_date("13/01/2024") == "Invalid Date"  # Inva
assert validate_and_format_date("12/31/2022") == "2022-12-31"
assert validate_and_format_date("2/29/2021") == "Invalid Date"   # Not
assert validate_and_format_date("02/29/2024") == "2024-02-29"    # Leap

print("All AI-generated test cases passed.")
```

```
All test cases passed!
PS C:\Users\DELL\OneDrive\Desktop\New folder> ^C
PS C:\Users\DELL\OneDrive\Desktop\New folder>
PS C:\Users\DELL\OneDrive\Desktop\New folder>  c:; cd 'c:\Users\DELL\One
Drive\Desktop\New folder'; & 'c:\Users\DELL\AppData\Local\Microsoft\Wind
owsApps\python3.11.exe' 'c:\Users\DELL\.vscode\extensions\ms-python.debu
gpy-2025.10.0-win32-x64\bundled\libs\debugpy\launcher' '64515' '--' 'C:\
Users\DELL\OneDrive\Desktop\New folder\t4.jl'
All AI-generated test cases passed.
PS C:\Users\DELL\OneDrive\Desktop\New folder> 
```

Classification with Loops – Apply AI for Edge Case Handling)
• Task: Use AI to generate at least 3 assert test cases for a classify_number(n) function. Implement using loops.
• Requirements:
o Classify numbers as Positive, Negative, or Zero.
o Handle invalid inputs like strings and None.
o Include boundary conditions (-1, 0, 1).
Example Assert Test Cases:
assert classify_number(10) == "Positive"
assert classify_number(-5) == "Negative"
assert classify_number(0) == "Zero"
Expected Output #2:
• Classification logic passing all assert tests

OBSERVATION : **Objective**

Implement an Inventory class to manage stock, and use **AI to generate at least 3 assert-based test cases** to verify its methods:

Inventory Class Methods

1. **add_item(name, quantity)**
    - Adds a new item or increases stock.
2. **remove_item(name, quantity)**
    - Decreases stock if available; ignore or prevent negatives.
3. **get_stock(name)**
    - Returns current stock (default to 0 if item not present).

Task 5: Use AI to generate at least 3 assert test cases for validate_and_format_date(date_str) to check and convert dates.

- Requirements:
    - YYYY" format.
    - Handle invalid dates.
    - Convert valid dates to "YYYY-MM-DD".

Example Assert Test Cases:

```
assert validate_and_format_date("10/15/2023") == "2023-10-15"
assert validate_and_format_date("02/30/2023") == "Invalid Date"
assert validate_and_format_date("01/01/2024") == "2024-01-01"
```

Expected Output #5:

- Function passes all AI-generated assertions and handles edge cases.

PROMPT : generate at least 3 assert test cases for validate_and_format_date(date_str) to check and convert dates.

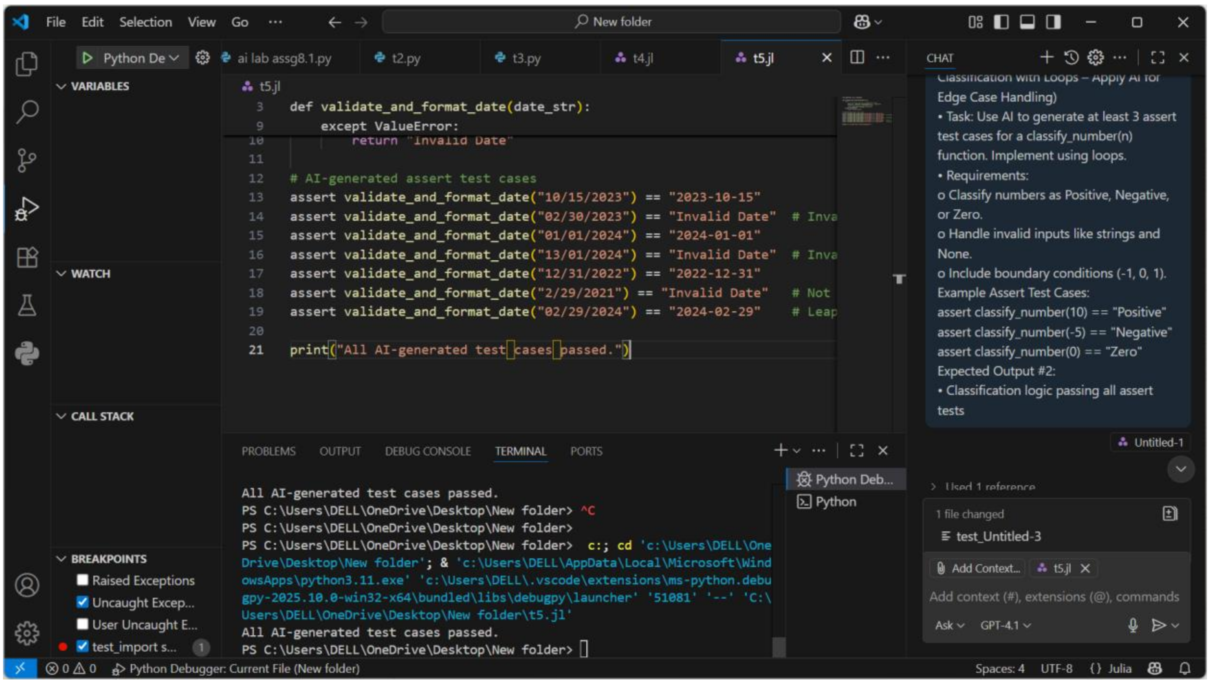
- Requirements:
    - Validate "MM/DD/YYYY" format.
    - Handle invalid dates.
    - Convert valid dates to "YYYY-MM-DD".

CODE : From datetime import datetime

```
def validate_and_format_date(date_str):
    try:
        # Try to parse the date in MM/DD/YYYY format
        date_obj = datetime.strptime(date_str, "%m/%d/%Y")
        # Return the date in YYYY-MM-DD format
        return date_obj.strftime("%Y-%m-%d")
```

```
  except ValueError:
    return "Invalid Date"


# AI-generated assert test cases
assert validate_and_format_date("10/15/2023") == "2023-10-15"
assert validate_and_format_date("02/30/2023") == "Invalid Date"  # Invalid day in February
assert validate_and_format_date("01/01/2024") == "2024-01-01"
assert validate_and_format_date("13/01/2024") == "Invalid Date"  # Invalid month
assert validate_and_format_date("12/31/2022") == "2022-12-31"
assert validate_and_format_date("2/29/2021") == "Invalid Date"   # Not a leap year
assert validate_and_format_date("02/29/2024") == "2024-02-29"    # Leap year


print("All AI-generated test cases passed.")
```

OUTPUT :



```
def validate_and_format_date(date_str):
    except ValueError:
        return "Invalid Date"

# AI-generated assert test cases
assert validate_and_format_date("10/15/2023") == "2023-10-15"
assert validate_and_format_date("02/30/2023") == "Invalid Date"  # Inva
assert validate_and_format_date("01/01/2024") == "2024-01-01"
assert validate_and_format_date("13/01/2024") == "Invalid Date"  # Inva
assert validate_and_format_date("12/31/2022") == "2022-12-31"
assert validate_and_format_date("2/29/2021") == "Invalid Date"  # Not
assert validate_and_format_date("02/29/2024") == "2024-02-29"   # Leap

print("All AI-generated test cases passed.")
```

```
All AI-generated test cases passed.
PS C:\Users\DELL\OneDrive\Desktop\New folder> ^C
PS C:\Users\DELL\OneDrive\Desktop\New folder>
PS C:\Users\DELL\OneDrive\Desktop\New folder>  c:; cd 'c:\Users\DELL\One
Drive\Desktop\New folder'; & 'c:\Users\DELL\AppData\Local\Microsoft\Wind
owsApps\python3.11.exe' 'c:\Users\DELL\.vscode\extensions\ms-python.debu
gpy-2025.10.0-win32-x64\bundled\libs\debugpy\launcher' '51081' '--' 'C:\
Users\DELL\OneDrive\Desktop\New folder\t5.jl'
All AI-generated test cases passed.
PS C:\Users\DELL\OneDrive\Desktop\New folder> 
```

Classification with Loops – Apply AI for
Edge Case Handling)
• Task: Use AI to generate at least 3 assert test cases for a classify_number(n) function. Implement using loops.
• Requirements:
o Classify numbers as Positive, Negative, or Zero.
o Handle invalid inputs like strings and None.
o Include boundary conditions (-1, 0, 1).
Example Assert Test Cases:
assert classify_number(10) == "Positive"
assert classify_number(-5) == "Negative"
assert classify_number(0) == "Zero"
Expected Output #2:
• Classification logic passing all assert tests

1 file changed
test_Untitled-3

OBSERVATION : **Objective**

Create a function validate_and_format_date(date_str) that:

- **Validates** if the input string is a valid date in "YYYY-MM-DD" or "YYYY/MM/DD" format.
- **Converts** valid dates to "YYYY-MM-DD" format.

- **Handles invalid dates** (returns "Invalid date").

Also, use **AI to generate at least 3 assert test cases** to check functionality.

📜 Requirements

1. **Input Format**: Accepts input like "YYYY-MM-DD" or "YYYY/MM/DD".
2. **Output Format**: Always returns "YYYY-MM-DD" (standardized).
3. **Invalid Dates**:
    - Wrong format (e.g. "2023-13-40")
    - Non-date strings (e.g. "abcd")
    - ⍰ Incomplete date strings (e.g. "2022-07")