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## School of Computer Science and Artificial Intelligence

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### Lab Assignment # 08

**Course Title** : AI Assistant Coding  
**Name of Student** : B.Sai Varsha  
**Enrollment No.** : 2303A54065  
**Batch No.** : 48

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

#### **Task Description #1 (Password Strength Validator – Apply AI in Security Context)**

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

• **Requirements:**

- o Password must have at least 8 characters.
- o Must include uppercase, lowercase, digit, and special character.
- o 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.

**Output Screenshot:**

```
task1.py task2.py task3.py task4.py task5.py
LAB8.1.PY > task1.py > ...
1 # Task 1: Password Strength Validator-|TDD Style
2 # Step 1: Test Cases (TDD Style)
3
4 import re
5
6 def is_strong_password(password):
7     if len(password) < 8:
8         return False
9     if " " in password:
10        return False
11    if not re.search(r"[A-Z]", password):
12        return False
13    if not re.search(r"[a-z]", password):
14        return False
15    if not re.search(r"[0-9]", password):
16        return False
17    if not re.search(r"[!@#$%^&*(,.\?\"':{}|<>]", password):
18        return False
19    return True
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22 # Step 2: Test Cases (TDD Style)
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```

```
task1.py task2.py X task3.py task4.py task5.py
LAB8.1.PY > task2.py > ...
1 # Task 2: Number Classification
2 # Step 2: Implementation (Using Loop)
3
4 def classify_number(n):
5     if not isinstance(n, (int, float)):
6         return "Invalid Input"
7
8     if n > 0:
9         return "Positive"
10    elif n < 0:
11        return "Negative"
12    else:
13        return "Zero"
14
15
16 # Step 1: Test Cases (TDD Style)
17
18 def test_classify_number():
19     # Positive number
20     assert classify_number(10) == "Positive"
21
22     # Negative number
23     assert classify_number(-5) == "Negative"
24
25
26 PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
27
28 Classification logic passing all AI-generated test cases.
29 PS C:\Users\saiva\OneDrive\Desktop\AI assisted coding> python -m doctest -v LAB8.1.PY/task2.py
30 Classification logic passing all AI-generated test cases.
31 3 items had no tests:
32     task2
33     task2.classify_number
34     task2.test_classify_number
35 0 tests in 3 items.
36 0 passed.
37 Test passed.
```

**Explanation:** This sorts numbers into positive, negative, or zero, while politely rejecting anything that isn't a number.

### Task Description #3 (Anagram Checker – Apply AI for String Analysis)

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

• **Requirements:**

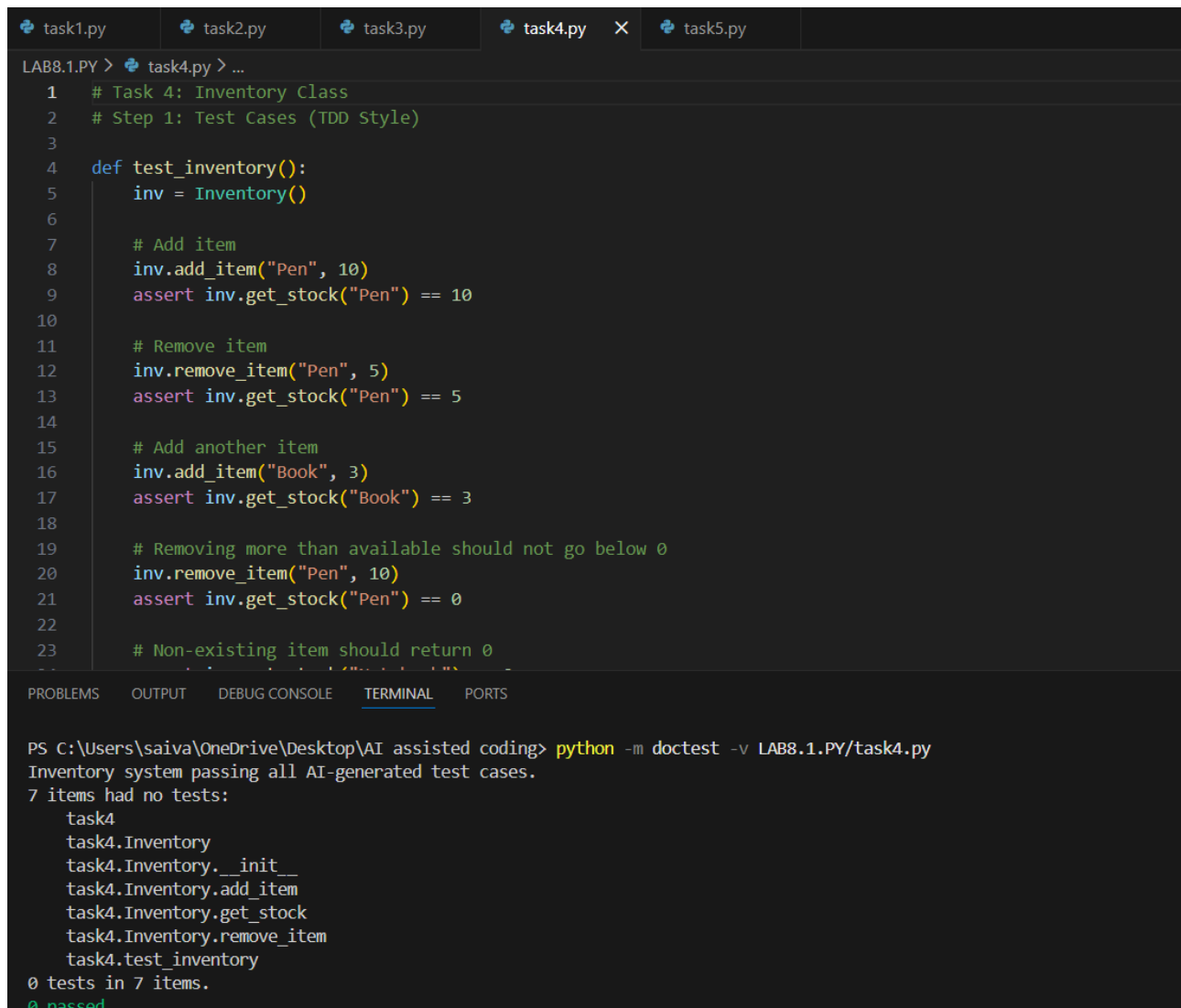
- o Ignore case, spaces, and punctuation.
- o Handle edge cases (empty strings, identical words).

**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.

## Output Screenshot:



```
task1.py task2.py task3.py task4.py X task5.py
LAB8.1.PY > task4.py > ...
1 # Task 4: Inventory Class
2 # Step 1: Test Cases (TDD Style)
3
4 def test_inventory():
5     inv = Inventory()
6
7     # Add item
8     inv.add_item("Pen", 10)
9     assert inv.get_stock("Pen") == 10
10
11    # Remove item
12    inv.remove_item("Pen", 5)
13    assert inv.get_stock("Pen") == 5
14
15    # Add another item
16    inv.add_item("Book", 3)
17    assert inv.get_stock("Book") == 3
18
19    # Removing more than available should not go below 0
20    inv.remove_item("Pen", 10)
21    assert inv.get_stock("Pen") == 0
22
23    # Non-existing item should return 0
24
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS C:\Users\saiva\OneDrive\Desktop\AI assisted coding> python -m doctest -v LAB8.1.PY/task4.py
Inventory system passing all AI-generated test cases.
7 items had no tests:
  task4
  task4.Inventory
  task4.Inventory.__init__
  task4.Inventory.add_item
  task4.Inventory.get_stock
  task4.Inventory.remove_item
  task4.test_inventory
0 tests in 7 items.
0 passed,
```

**Explanation:** This spots whether two words or phrases are made of the same letters, ignoring case, spaces, and punctuation.

## Task Description #4 (Inventory Class – Apply AI to Simulate Real- World Inventory System)

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

- **Methods:**

- o add\_item(name, quantity)
- o remove\_item(name, quantity)
- o 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.**

### Output Screenshot:

```
task1.py task2.py task3.py task4.py X task5.py
LAB8.1.PY > task4.py > ...
1 # Task 4: Inventory Class
2 # Step 1: Test Cases (TDD Style)
3
4 def test_inventory():
5     inv = Inventory()
6
7     # Add item
8     inv.add_item("Pen", 10)
9     assert inv.get_stock("Pen") == 10
10
11    # Remove item
12    inv.remove_item("Pen", 5)
13    assert inv.get_stock("Pen") == 5
14
15    # Add another item
16    inv.add_item("Book", 3)
17    assert inv.get_stock("Book") == 3
18
19    # Removing more than available should not go below 0
20    inv.remove_item("Pen", 10)
21    assert inv.get_stock("Pen") == 0
22
23    # Non-existing item should return 0
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\saiva\OneDrive\Desktop\AI assisted coding> python -m doctest -v LAB8.1.PY/task4.py
Inventory system passing all AI-generated test cases.
7 items had no tests:
  task4
  task4.Inventory
  task4.Inventory.__init__
  task4.Inventory.add_item
  task4.Inventory.get_stock
  task4.Inventory.remove_item
  task4.test_inventory
0 tests in 7 items.
0 passed
```

**Explanation:** This simulates a mini store system where you can add, remove, and check stock for items.

### Task Description #5 (Date Validation & Formatting – Apply AI for Data Validation)

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

- **Requirements:**

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

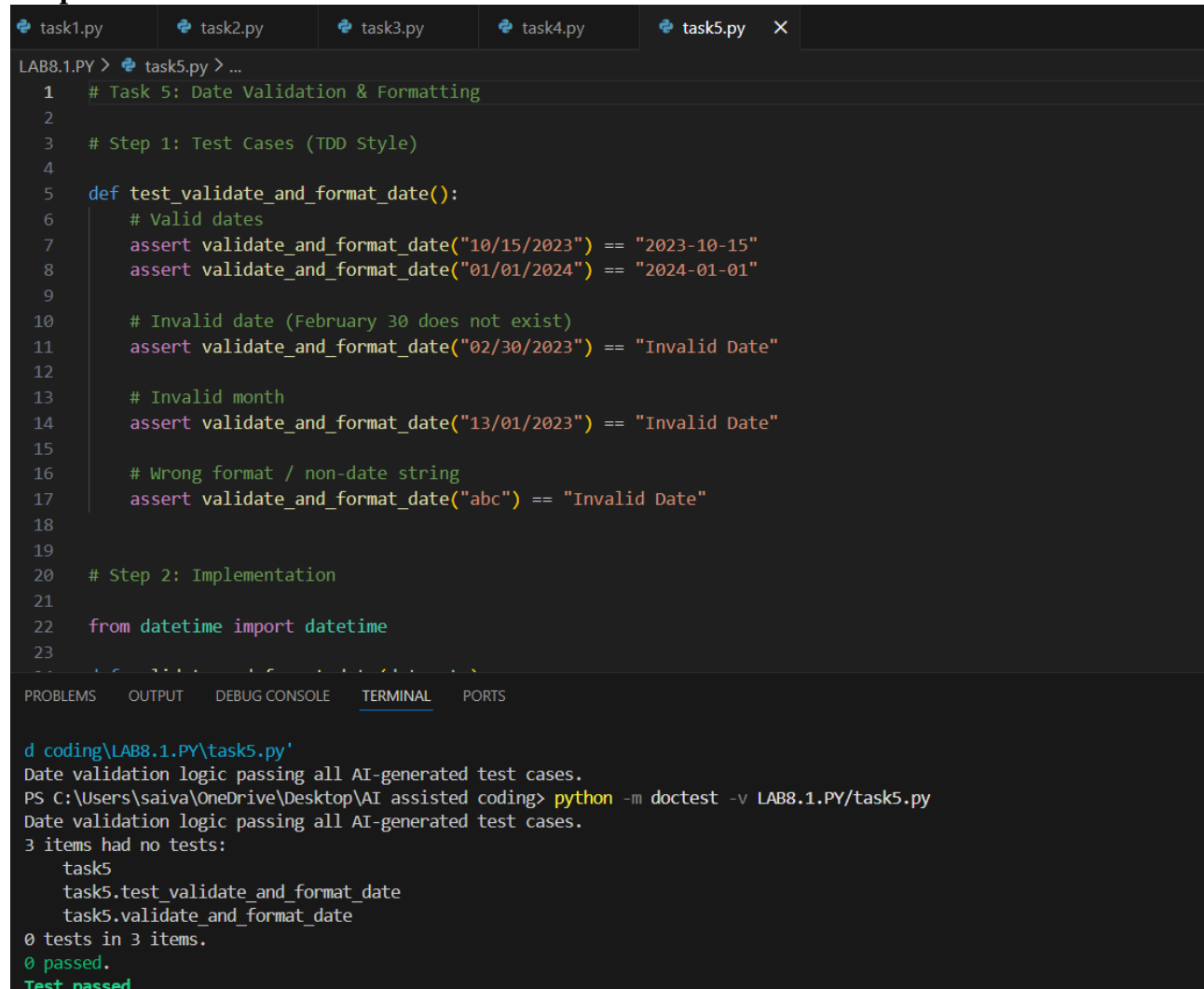
### Example Assert Test Cases:

```
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.

### Output Screenshot:



The screenshot displays a code editor with a file explorer at the top showing tabs for task1.py, task2.py, task3.py, task4.py, and task5.py. The active file is task5.py, which contains the following Python code:

```
1 # Task 5: Date Validation & Formatting
2
3 # Step 1: Test Cases (TDD Style)
4
5 def test_validate_and_format_date():
6     # Valid dates
7     assert validate_and_format_date("10/15/2023") == "2023-10-15"
8     assert validate_and_format_date("01/01/2024") == "2024-01-01"
9
10    # Invalid date (February 30 does not exist)
11    assert validate_and_format_date("02/30/2023") == "Invalid Date"
12
13    # Invalid month
14    assert validate_and_format_date("13/01/2023") == "Invalid Date"
15
16    # Wrong format / non-date string
17    assert validate_and_format_date("abc") == "Invalid Date"
18
19
20 # Step 2: Implementation
21
22 from datetime import datetime
23
```

Below the code editor, the terminal window shows the execution of the doctest command:

```
d coding\LAB8.1.PY\task5.py'
Date validation logic passing all AI-generated test cases.
PS C:\Users\saiva\OneDrive\Desktop\AI assisted coding> python -m doctest -v LAB8.1.PY/task5.py
Date validation logic passing all AI-generated test cases.
3 items had no tests:
  task5
  task5.test_validate_and_format_date
  task5.validate_and_format_date
0 tests in 3 items.
0 passed.
Test passed.
```

**Explanation:** This ensures a date is valid in “MM/DD/YYYY” format and neatly converts it into “YYYY-MM-DD”.