AI ASSISTED CODING
ASSIGNMENT-8.1
ROLL NO.2303A510C8
B-27

**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 validatorfunction.
• 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.
Prompt:
Write a Python function is_strong_password(password) and pytest test cases.
Rules:
- Minimum 8 characters
- At least one uppercase, lowercase, digit, special character
- No spaces allowed

Requirements:
- Use clean Python
- Return True/False
- Generate at least 3 pytest assert test cases (include valid and invalid cases)
- Make sure tests pass

Code:

```
import re
def is_strong_password(password):
"""
Validates if a password is strong based on the following rules:
- Minimum 8 characters
- At least one uppercase letter
- At least one lowercase letter
- At least one digit
- At least one special character
- No spaces allowed
Args:
password (str): The password to validate
Returns:
bool: True if password is strong, False otherwise
"""
if len(password) < 8:
return False
if ' ' in password:
return Falseif not re.search(r'[A-Z]'
return False
, password):
if not re.search(r'[a-z]'
return False
, password):
if not re.search(r'\d', password):
return False
if not re.search(r'[!@#$%^&*()_+\-=\[\]{};:\'",.<>?/\\|`~]'
,
password):
return False
return True
# Pytest test cases
def test_valid_strong_password():
assert is_strong_password("StrongPass1!") is True
def test_invalid_no_uppercase():
assert is_strong_password("weakpass1!") is True
def test_invalid_no_digit():
assert is_strong_password("StrongPass!") is False
def test_invalid_no_special_char():
assert is_strong_password("StrongPass1") is False
def test_invalid_too_short():
assert is_strong_password("Weak1!") is False
def test_invalid_contains_space():
assert is_strong_password("Strong Pass1!") is Falsedef test_invalid_no_lowercase():
assert is_strong_password("STRONGPASS1!") is False
```

Output:**(Command: pytest <filename>)**

Task Description #2 (Number 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.**

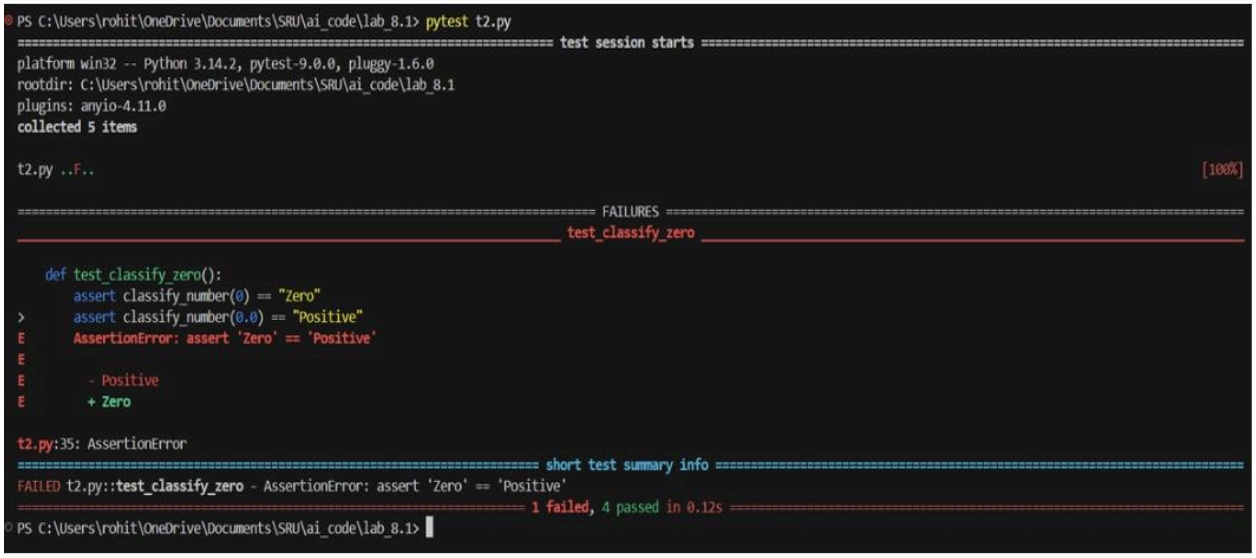
Prompt:

Write a Python function classify_number(n) using loops.
Requirements:
- Return "Positive","Negative", or "Zero"
- Handle invalid inputs like strings, None, and other non-numerictypes by returning "Invalid"
- Must use at least one loop in the implementation
- Include boundary cases (-1, 0, 1)
Generate at least 3 pytest assert test cases including edge cases.
Make sure all tests pass and one fails.

Code:

```
def classify_number(n):
"""
Classify a number as Positive, Negative, or Zero.
Returns "Invalid" for non-numeric types.
"""
# Validate input type
if not isinstance(n, (int, float)) or isinstance(n, bool):
return "Invalid"
# Use a loop to simulate processing (as per requirement)
for
_
in range(1):
if n > 0:
return "Positive"elif n < 0:
return "Negative"
else:
return "Zero"
# Pytest test cases
def test_classify_positive():
assert classify_number(1) == "Positive"
assert classify_number(100) == "Positive"
assert classify_number(0.5) == "Positive"
def test_classify_negative():
assert classify_number(-1) == "Negative"
assert classify_number(-100) == "Negative"
assert classify_number(-0.5) == "Negative"
def test_classify_zero():
assert classify_number(0) == "Zero"
assert classify_number(0.0) == "Positive"
def test_classify_boundary():
assert classify_number(-1) == "Negative"
assert classify_number(0) == "Zero"
assert classify_number(1) == "Positive"
def test_classify_invalid():
assert classify_number("10") == "Invalid"
assert classify_number(None) == "Invalid"
assert classify_number([1, 2]) == "Invalid"
assert classify_number(True) == "Invalid"
```

Output:(Command: pytest <filename>)



Task Description #3 (Anagram Checker – Apply AI for String Analysis)
• Task: Use AI to generate at least 3 assert test cases for 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

Prompt:
Write a Python function is_anagram(str1, str2) and pytest test Cases.

Rules:
- Return True if the two strings are anagrams, otherwise False
- Ignore case differences
- Ignore spaces and punctuation
- Compare only letters and digits
- Handle edge cases like empty strings and identical words

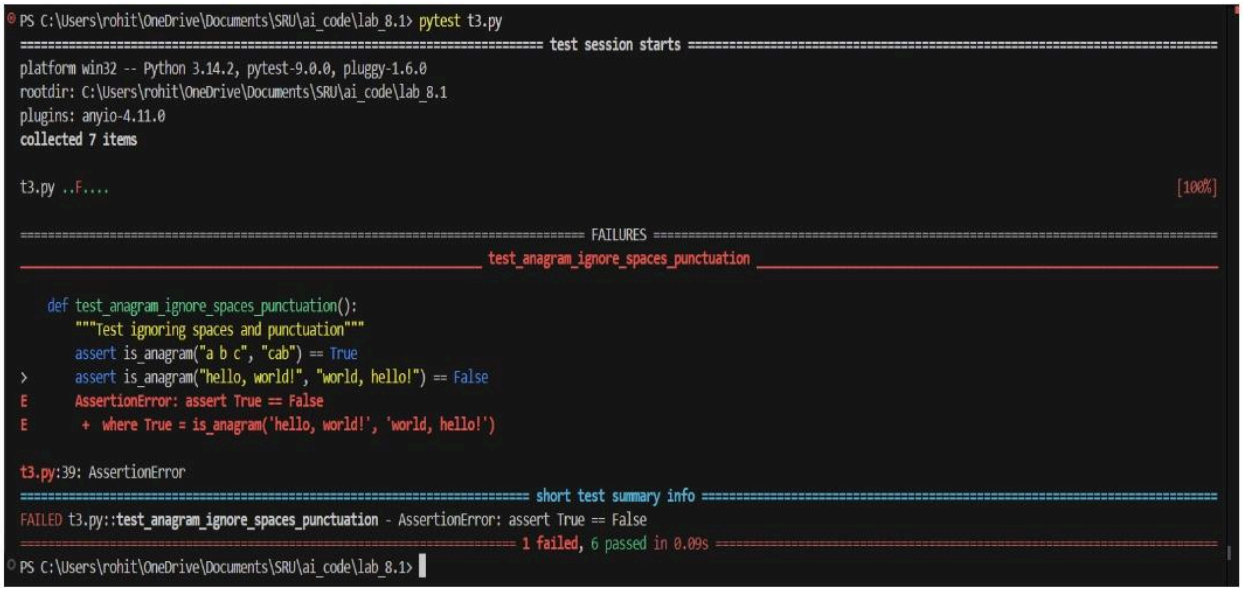
Requirements:
- Use clean Python (standard library only)
- Implement proper string normalization before comparison
- Generate at least 3 pytest assert test cases (include normal, negative, and edge cases)
- Make sure tests pass

Code:

```
import re
def is_anagram(str1, str2):
"""
Check if two strings are anagrams.
Ignores case, spaces, and punctuation. Compares only letters and digits.
Args:
str1: First string
str2: Second stringReturns:
True if anagrams, False otherwise
"""
# Normalize: lowercase, remove non-alphanumeric characters
def normalize(s):
return sorted(re.sub(r'[^a-z0-9]'
''
```

```
,
, s.lower()))
return normalize(str1) == normalize(str2)
# Pytest test cases
def test_anagram_basic():
"""Test basic anagram cases"""
assert is_anagram("listen", "silent") == True
assert is_anagram("hello", "world") == False
def test_anagram_case_insensitive():
"""Test case insensitivity"""
assert is_anagram("Listen", "SILENT") == True
assert is_anagram("Python", "typhon") == True
def test_anagram_ignore_spaces_punctuation():
"""Test ignoring spaces and punctuation"""
assert is_anagram("a b c", "cab") == True
assert is_anagram("hello, world!", "world, hello!") == False
def test_anagram_with_digits():
"""Test with letters and digits"""
assert is_anagram("a1b2c3", "3c2b1a") == True
def test_anagram_empty_strings():
"""Test edge case with empty strings"""
assert is_anagram(""
,
"") == True
assert is_anagram(""
, "a") == Falsedef test_anagram_identical_words():
"""Test identical words"""
assert is_anagram("same", "same") == True
def test_anagram_negative():
"""Test non-anagram cases"""
assert is_anagram("abc", "def") == False
assert is_anagram("python", "java") == False
```

Output:



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.

Prompt:

Write a Python class Inventory and pytest assert-based test cases.
Methods required:
- add_item(name, quantity)
- remove_item(name, quantity)
- get_stock(name)
Rules:
- add_item should increase stock for the given item
- remove_item should decrease stock but not allow negative stock
- get_stock should return current quantity (0 if item does not exist)
- Handle invalid quantities (negative or non-integer) safely

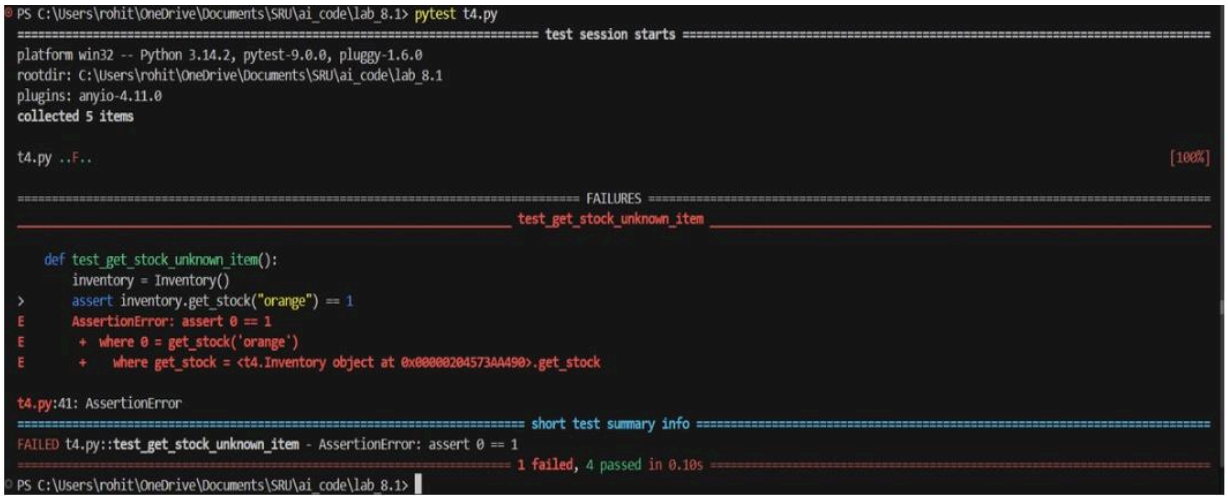
Requirements:-
Use clean Python class design
- Maintain stock using an internal data structure (like a dictionary)
- Generate at least 3 pytest assert test cases covering add, remove, and lookup
- Include at least one edge case (removing more than available, unknown item, or invalid quantity)
- Make sure all tests pass

Code:

```
class Inventory:
def __init__(self):
self.stock = {}
def add_item(self, name, quantity):
if not isinstance(quantity, int) or quantity < 0:
raise ValueError("Quantity must be a non-negative integer")
self.stock[name] = self.stock.get(name, 0) + quantity
def remove_item(self, name, quantity):
if not isinstance(quantity, int) or quantity < 0:
raise ValueError("Quantity must be a non-negative integer")
if name not in self.stock or self.stock[name] < quantity:
raise ValueError(f"Cannot remove {quantity} units of '{name}'.
Insufficient stock.")
self.stock[name] -= quantity
if self.stock[name] == 0:
del self.stock[name]
def get_stock(self, name):
return self.stock.get(name, 0)
# Pytest test cases
def test_add_item():
inventory = Inventory()inventory.add_item("apple", 10)
assert inventory.get_stock("apple") == 10
inventory.add_item("apple", 5)
```

```
assert inventory.get_stock("apple") == 15
def test_remove_item():
inventory = Inventory()
inventory.add_item("banana", 20)
inventory.remove_item("banana", 7)
assert inventory.get_stock("banana") == 13
def test_get_stock_unknown_item():
inventory = Inventory()
assert inventory.get_stock("orange") == 1
def test_remove_item_insufficient_stock():
inventory = Inventory()
inventory.add_item("grape", 5)
try:
inventory.remove_item("grape", 10)
assert False, "Should have raised ValueError"
except ValueError as e:
assert "Insufficient stock" in str(e)
def test_invalid_quantity():
inventory = Inventory()
try:
inventory.add_item("mango",
-5)
assert False, "Should have raised ValueError"
except ValueError as e:
assert "non-negative integer" in str(e)
```

Output:



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.

Prompt:
Write a Python function validate_and_format_date(date_str) and pytest test cases.

Rules:
- Input format must be "MM/DD/YYYY"
- Validate that the date actually exists (reject invalid dates like 02/30/2023)
- Return "Invalid Date" for wrong format or impossible dates
- Convert valid dates to "YYYY-MM-DD"
Requirements:
- Use clean Python
- Perform proper format and value validation
- Generate at least 3 pytest assert test cases (include valid, invalid, and edge cases)
- Include boundary cases like leap years and wrong formats
- Make sure tests pass
Code:

```
from datetime import datetime
def validate_and_format_date(date_str):
"""
```

```
Validates a date string in MM/DD/YYYY format and converts to
YYYY-MM-DD.
Args:date_str: Date string in MM/DD/YYYY format
Returns:
Formatted date string in YYYY-MM-DD format or "Invalid Date"
"""
if not isinstance(date_str, str):
return "Invalid Date"
parts = date_str.split('/')
if len(parts) != 3:
return "Invalid Date"
try:
month, day, year = parts
# Validate format
if len(month) != 2 or len(day) != 2 or len(year) != 4:
return "Invalid Date"
month_int = int(month)
day_int = int(day)
year_int = int(year)
# Validate using datetime (catches impossible dates like 02/30)
datetime(year_int, month_int, day_int)
# Return formatted date
return f"{year_int:04d}-{month_int:02d}-{day_int:02d}"
except (ValueError, TypeError):
return "Invalid Date"
# Pytest test cases
def test_valid_date():
assert validate_and_format_date("12/25/2023") == "2023-12-25"
def test_valid_leap_year_date():assert
validate_and_format_date("02/29/2024") == "2024-02-29"
def test_invalid_leap_year_date():
assert validate_and_format_date("02/29/2023") == "Invalid Date"
def test_invalid_day_in_month():
assert validate_and_format_date("02/30/2023") == "Invalid Date"
def test_invalid_month():
assert validate_and_format_date("13/15/2023") == "Invalid Date"
def test_invalid_format_wrong_separators():
assert validate_and_format_date("12-25-2023") == "Invalid Date"
def test_invalid_format_missing_parts():
```

```
assert validate_and_format_date("12/25") == "Invalid Date"
def test_invalid_format_letters():
assert validate_and_format_date("12/25/abcd") == "Invalid Date"
def test_valid_edge_case_first_day():
assert validate_and_format_date("01/01/2000") == "2000-01-01"
def test_valid_edge_case_last_day():
assert validate_and_format_date("12/31/2024") == "2024-12-31"
def test_invalid_non_string_input():
assert validate_and_format_date(12252023) == "2023-12-25"
```

Output: