

## **ASSIGNMENT-8.5**

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**Task Description #1 (Username Validator – Apply AI in Authentication Context)**

- Task: Use AI to generate at least 3 assert test cases for a function `is_valid_username(username)` and then implement the function using Test-Driven Development principles.

- Requirements:

- o Username length must be between 5 and 15 characters.
  - o Must contain only alphabets and digits.
  - o Must not start with a digit.

- o No spaces allowed. Example Assert Test Cases:

```
assert is_valid_username("User123") == True
```

```
assert is_valid_username("12User") == False
```

```
assert is_valid_username("Us er") == False
```

**Expected Output #1:**

- Username validation logic successfully passing all AI-generated test cases.

Output:

The screenshot shows the Gemini AI interface with a Python script titled "username validator". The script contains a function `is\_valid\_username` with several conditional checks for length, type, and first character. Below the function is a section of test cases using `assert` statements. A tooltip from Gemini suggests implementing the function and its test cases. The interface includes standard code editor features like a sidebar with icons, a toolbar at the top, and a status bar at the bottom.

```

username validator

Gemini
+ Function
+def is_valid_username(username):
+    if not isinstance(username, str):
+        return False
+    if len(username) < 5:
+        return False
+    if not username.isalnum():
+        return False
+    if username[0].isdigit():
+        return False
+    return True
+
+Test cases
+assert is_valid_username('user1')
+assert is_valid_username('user2')
+assert is_valid_username('user3')

```

## Task Description #2 (Even–Odd & Type Classification – Apply AI for Robust Input Handling)

- Task: Use AI to generate at least 3 assert test cases for a function `classify_value(x)` and implement it using conditional logic and loops.

- Requirements:

- If input is an integer, classify as "Even" or "Odd".
- If input is 0, return "Zero".
- If input is non-numeric, return "Invalid Input".

Example Assert Test Cases:

```
assert classify_value(8) == "Even" assert
classify_value(7) == "Odd" assert
```

```
classify_value("abc") == "Invalid Input"
```

Expected Output #2:

- Function correctly classifying values and passing all test cases.

Output:

The screenshot shows the Gemini AI interface. In the main code editor, there is a Python script with a function definition and some test cases. A tooltip from the AI provides instructions for creating a function named `classify_input`. The AI also has a text input field asking what it can help build, and a status bar at the bottom indicating "Gemini 2.5 Flash".

```
+# Function
+def classify_input(value):
+    if isinstance(value, int):
+        if value % 2 == 0:
+            return f"{value} is an even integer."
+        else:
+            return f"{value} is an odd integer."
+    else:
+        return f"{value} is not an integer."
+
+# Test cases
+assert classify_input(4) == "4 is an even integer."
+assert classify_input(7) == "7 is an odd integer."
+assert classify_input("Hello") == "'Hello' is not an integer."
+assert classify_input(3.14) == "3.14 is not an integer."
```

**Task Description #3 (Palindrome Checker – Apply AI for String Normalization)**

- Task: Use AI to generate at least 3 assert test cases for a function `is_palindrome(text)` and implement the function.
- Requirements:
  - o Ignore case, spaces, and punctuation.
  - o Handle edge cases such as empty strings and single characters.

Example Assert Test Cases:

```
assert is_palindrome("Madam") == True
```

```
assert is_palindrome("A man a plan a canal Panama") ==
```

True

```
assert is_palindrome("Python") == False Expected
```

Output #3:

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

Output:

The screenshot shows a Jupyter Notebook interface with a sidebar containing icons for Commands, Code, Text, Run all, and Help. The main area is titled "Task-03". A code cell titled "Gemini" contains Python code for a palindrome checker and some test cases. A tooltip from Gemini provides instructions for creating the function and running tests. A message box from Gemini asks what can be built, with options to accept or cancel. The bottom right corner shows the Gemini 2.5 Flash logo.

```
+# Function
+def is_palindrome(text):
+    # Normalize the string: convert to lowercase and remove non-alphanumeric characters
+    normalized_text = ''.join([c.lower() for c in text if c.isalnum()])
+
+    # Check if the normalized text is equal to its reverse
+    return normalized_text == normalized_text[::-1]
+
+# Test cases
+assert is_palindrome("Racecar") == True
+assert is_palindrome("A man a plan a canal Panama") == True
+assert is_palindrome("Hello world") == False
+assert is_palindrome("No lemon, no melon") == True
+assert is_palindrome("Python") == False
+assert is_palindrome("Madam") == True
+assert is_palindrome("Was it a car or a cat I saw") == True
```

## Task Description #4 (BankAccount Class – Apply AI for

Object-Oriented Test-Driven Development)

- Task: Ask AI to generate at least 3 assert-based test cases for a BankAccount class and then implement the class.

- Methods:

- o deposit(amount)

- o withdraw(amount)

- o get\_balance()

## Example Assert Test Cases:

```
acc = BankAccount(1000)
```

```
acc.deposit(500)
```

```
assert acc.get_balance() == 1500
```

```
acc.withdraw(300)
```

```
assert acc.get_balance() == 1200 Expected
```

## Output #4:

- Fully functional class that passes all AI-generated assertions.

## Output:

The screenshot shows the Gemini AI interface with the following details:

- Code Completion Panel (Top):** Shows the `BankAccount` class definition with methods `deposit` and `withdraw`. A tooltip provides instructions for creating the class and running tests.
- Test Results Panel (Bottom):** Displays a series of test cases (Test 10 to Test 13) for the `BankAccount` class. Each test includes an assertion, an expected result, and a got value. All tests pass successfully.
- Feedback Box:** A box at the bottom right asks "What can I help you build?" with a "Gemini 2.5 Flash" button.

```
+# Function: BankAccount Class
+class BankAccount:
+    def __init__(self, initial_balance=0):
+        if not isinstance(initial_balance, (int, float)) or initial_balance < 0:
+            raise ValueError
+        self.balance = initial_balance
+
+    def deposit(self, amount):
+        if not isinstance(amount, (int, float)):
+            raise ValueError
+        self.balance += amount
+        return self.balance
+
+    def withdraw(self, amount):
+        if not isinstance(amount, (int, float)):
+            raise ValueError
+        if amount > self.balance:
+            raise ValueError
+        self.balance -= amount
+        return self.balance
```

```
[5] ✓ 0s
try:
    account10 = BankAccount(-50)
    assert False, "Test 10 Failed: Expected ValueError for negative initial balance"
except ValueError as e:
    assert str(e) == "Initial balance must be a non-negative number.", f"Test 10 Failed: Wrong error message: {e}"

# Test 11: Initial balance as float
account11 = BankAccount(100.50)
assert account11.get_balance() == 100.50, f"Test 11 Failed: Expected 100.50, got {account11.get_balance()}"

# Test 12: Deposit float amount
account12 = BankAccount(50)
account12.deposit(25.75)
assert account12.get_balance() == 75.75, f"Test 12 Failed: Expected 75.75, got {account12.get_balance()}"

# Test 13: Withdraw float amount
account13 = BankAccount(100.25)
account13.withdraw(10.15)
assert account13.get_balance() == 90.10, f"Test 13 Failed: Expected 90.10, got {account13.get_balance()}"

print("All BankAccount tests passed!")
```

... All BankAccount tests passed!

## **Task Description #5 (Email ID Validation – Apply AI for Data Validation)**

- Task: Use AI to generate at least 3 assert test cases for a function validate\_email(email) and implement the function.
- Requirements:
  - o Must contain @ and .
  - o Must not start or end with special characters.
  - o Should handle invalid formats gracefully.

Example Assert Test Cases:

```
assert validate_email("user@example.com") == True  
assert validate_email("userexample.com") == False  
assert validate_email("@gmail.com") == False
```

Expected Output #5:

- Email validation function passing all AI-generated test cases and handling edge cases correctly.

Output:

Commands + Code + Text ▶ Run all ⌂

Task-05

Gemini

```
# Function
import re

def is_valid_email(email):
    if not isinstance(email, str):
        return False
    # Regular expression
    # This pattern checks
    # It allows letters, numbers, and symbols
    pattern = r"^[a-zA-Z0-9_.+-]+@[a-zA-Z0-9-]+\.[a-zA-Z]{2,}$"
    if re.fullmatch(pattern, email):
        return True
    else:
        return False

# Test cases
assert is_valid_email("test@example.com")
assert is_valid_email("john.doe@example.org")
assert is_valid_email("info@company.co")
assert is_valid_email("user.name+alias@domain.net")
assert is_valid_email("user.name@domain.com")
```

M #5 (Email ID Validation – Apply AI for Data Validation)

Empty cell

Let's create a Python function `is_valid_email` that validates email addresses based on common patterns, and include test cases for various

Accept & Run ✓ Accept X Cancel

What can I help you build?

+ Gemini 2.5 Flash ▶

Gemini can make mistakes so double-check it and use code with caution. [Learn more](#)

Variables Terminal

✓ 11:59 AM Python 3

