

## **ASSIGNMENT-8.5**

**Name: Sri Harsha**

**Hall No:2303A52159**

**Batch:36**

**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:
  - Username length must be between 5 and 15 characters.
  - Must contain only alphabets and digits.
  - Must not start with a digit.
  - 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 development environment. The main area displays a Python script named 'username validator' with the following code:

```

# 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('abc')
assert is_valid_username('a1bc')
assert is_valid_username('a1b2c3')

```

A modal window titled '#1 (Username Validator – Apply AI in Authentication Context)' is open over the code. It contains the following text:

- <> Empty cell
- Let's implement the username validator function and its test cases in the selected cell.

At the bottom of the modal are buttons: 'Accept & Run', 'Accept', and 'Cancel'. Below the modal is a text input field with placeholder 'What can I help you build?' and a 'Gemini 2.5 Flash' dropdown.

## 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:
  - o If input is an integer, classify as "Even" or "Odd".
  - o If input is 0, return "Zero".
  - o 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. On the left, there's a code editor window titled 'Gemini' containing Python code for a 'classify\_input' function and some test cases. A modal dialog box is open in the center, titled 'Empty cell'. It contains the text: 'Let's create a Python function classify\_input that determines if an input is an even or odd integer, or classifies its type if it's not an integer, and add some test cases.' Below this is a button bar with 'Accept & Run', 'Accept', and 'Cancel'. At the bottom of the dialog is a text input field asking 'What can I help you build?'. The overall interface has a light green background.

## 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:
  - Ignore case, spaces, and punctuation.
  - 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 code editor interface with a sidebar on the left containing icons for file operations like New, Open, Save, and Run. The main area is titled "Task-03" and contains a code editor window. The code editor has a title bar "Gemini" and a status bar at the bottom. The code itself is a Python script with a function definition and several assert statements. A tooltip from Gemini provides instructions for creating a palindrome checker. A message box at the bottom asks "What can I help you build?" with options "Accept & Run", "Accept", and "Cancel". The status bar at the bottom right says "Gemini 2.5 Flash".

```
+# Function
+# def is_palindrome(text):
+    # Normalize the string: convert to lowercase and remove non-alphanumeric characters
+    normalized_text = ''.join([char.lower() for char in text if char.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") == False
+assert is_palindrome("No") == True
+assert is_palindrome("Python") == False
+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 a code editor interface with the following details:

- Top Bar:** Search, Commands, + Code, + Text, Run all, RAM/Disk status.
- Title Bar:** Task-04
- Left Sidebar:** File, Recent, Help, Gemini icon.
- Main Area (Gemini Panel):**
  - Code snippet for `BankAccount` class with `__init__`, `deposit`, and `withdraw` methods.
  - A callout from Gemini: "M #4 (BankAccount Class – Apply AI for Object-Oriented Test-Driven Development) <> Empty cell".
  - Another callout: "Let's create a `BankAccount` class with methods for `deposit`, `withdraw`, & `get_balance`.> Accept & Run ✓ Accept X Cancel".
  - Gemini input field: "What can I help you build? + Gemini 2.5 Flash ▶".
  - Gemini note: "Gemini can make mistakes so double-check it and use code with caution. [Learn more](#)".
- Bottom Area (Code Editor):**
  - Code for testing `BankAccount`:

```
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!")
```
  - Output: "... 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:

The screenshot shows a code editor window titled "Task-05". The code is as follows:

```
+# Function
+import re
+
+def is_valid_email(email):
+    if not isinstance(email, str):
+        return False
+    # Regular expression to check email format
+    # This pattern checks
+    # It allows letters, numbers, and underscores
+    # The top-level domain
+    pattern = r"^[a-zA-Z0-9_.+-]+@[a-zA-Z0-9-]+\.[a-zA-Z0-9-.]+$"
+    if re.fullmatch(pattern, email):
+        return True
+    else:
+        return False
+
+# Test cases
+assert is_valid_email("test@example.com") == True
+assert is_valid_email("john.doe@example.com") == True
+assert is_valid_email("invalid_email@.com") == False
+assert is_valid_email("invalid_email@invalid.com") == False
```

A Gemini AI interface is overlaid on the code. It has a sidebar with icons for file, code, text, run, and settings. The main area shows the code with annotations:

- A red circle with "M" is next to the first line of code.
- A tooltip says "#5 (Email ID Validation – Apply AI for Data Validation)".
- A message box says "Let's create a Python function `is_valid_email` that validates email addresses based on common patterns, and include test cases for various edge cases." with buttons "Accept & Run", "Accept", and "Cancel".
- A bottom message says "What can I help you build?" with a plus sign and "Gemini 2.5 Flash".
- A note at the bottom says "Gemini can make mistakes so double-check it and use code with caution. Learn more".

The status bar at the bottom shows "11:59 AM" and "Python 3".