

## 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
```

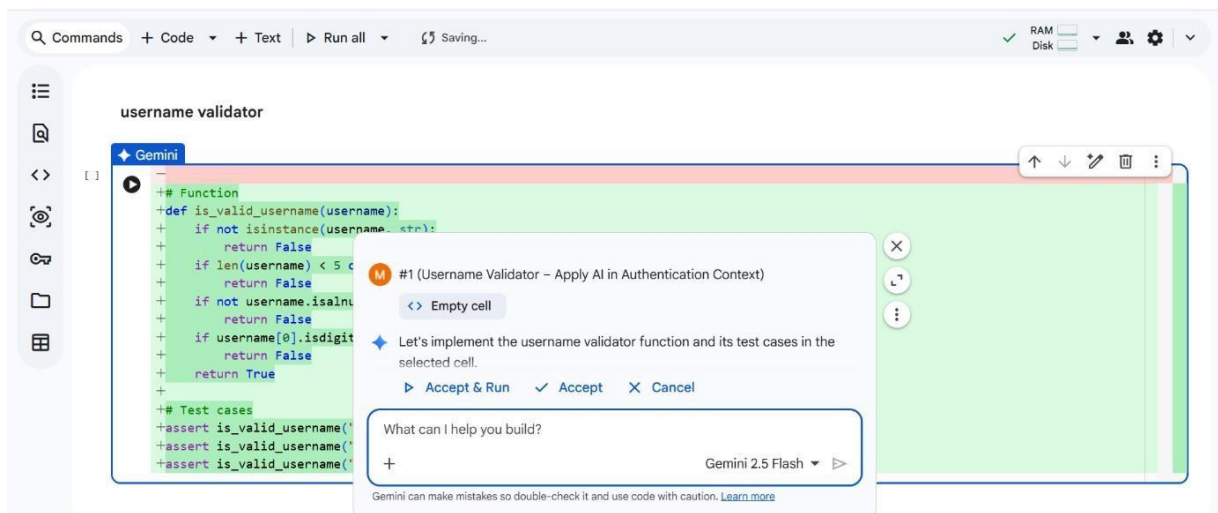
```
assert is_valid_username("12User") == False
```

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

Expected Output #1:

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

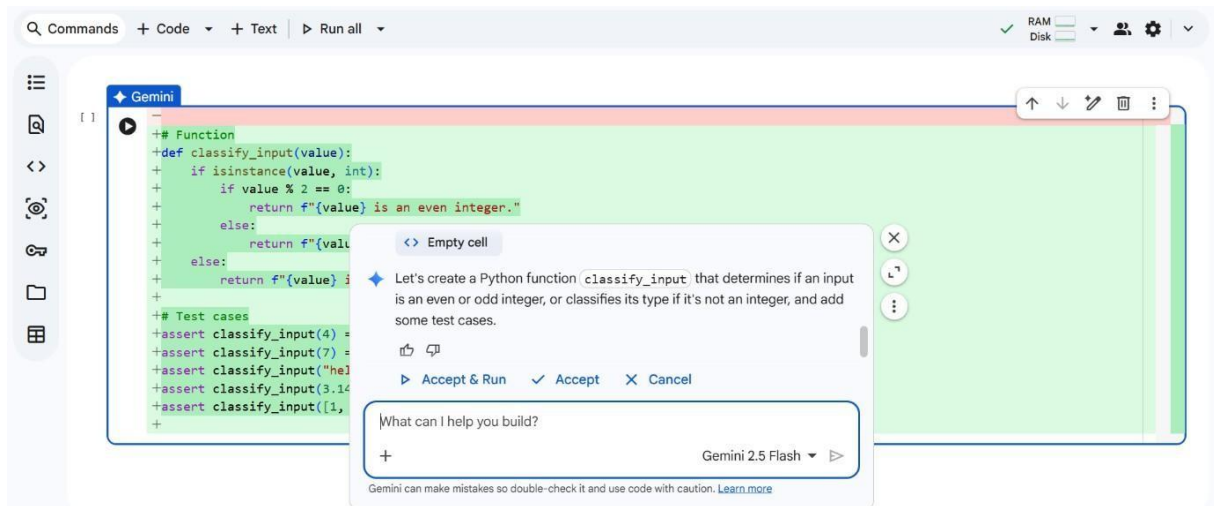
Output:



## 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:



### 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
```

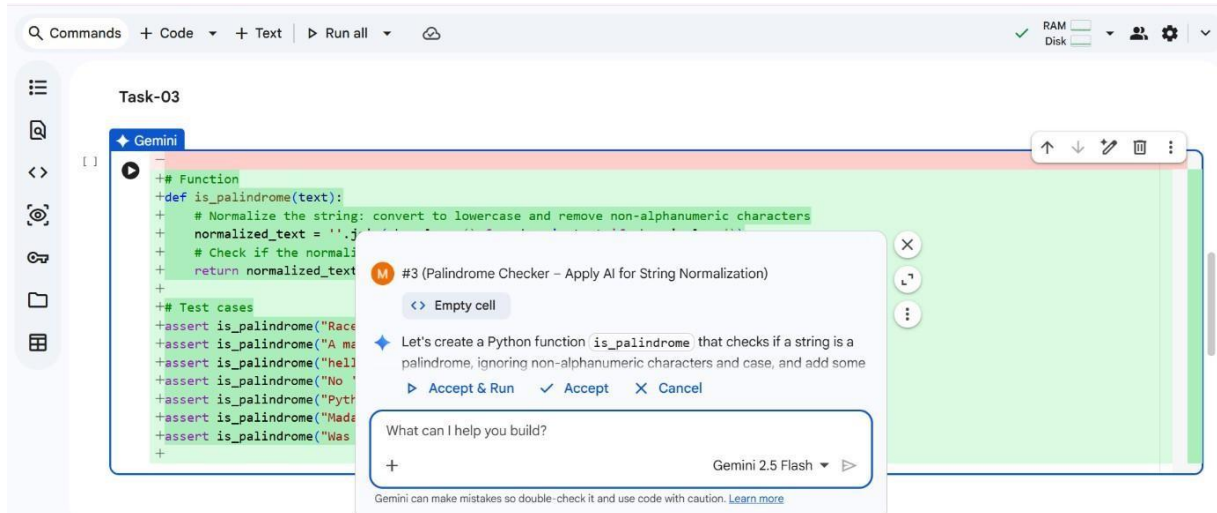
```
assert is_palindrome("A man a plan a canal Panama") == True
```

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

Output #3:

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

Output:



## 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:

```

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# 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)) or amount < 0:
            raise ValueError
        self.balance += amount
        return self.balance

    def withdraw(self, amount):
        if not isinstance(amount, (int, float)) or amount < 0:
            raise ValueError
        if amount > self.balance:
            raise ValueError
        self.balance -= amount
        return self.balance

# Test 10: Negative initial balance
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!")
  
```

## 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:

