Assignment-8.5

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Batch-23

Task-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:

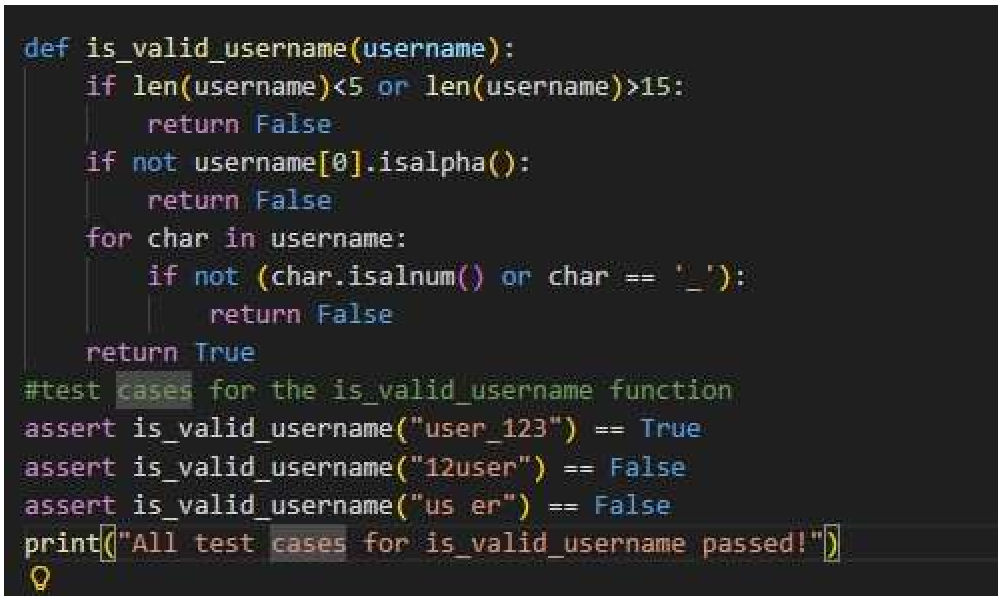
assert is_valid_username("User123") == True

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

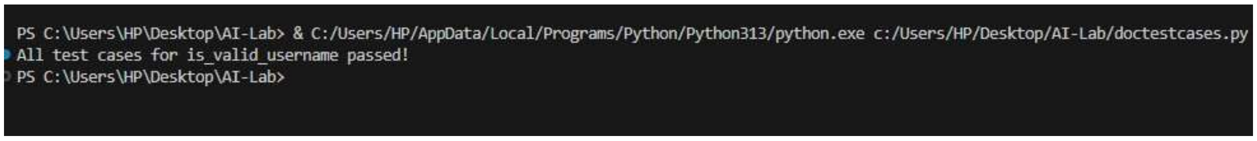
is_valid_username("Us er") == False Expected

Output #1:

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



```python
def is_valid_username(username):
    if len(username)<5 or len(username)>15:
        return False
    if not username[0].isalpha():
        return False
    for char in username:
        if not (char.isalnum() or char == '_'):
            return False
    return True
#test cases for the is_valid_username function
assert is_valid_username("user_123") == True
assert is_valid_username("12user") == False
assert is_valid_username("us er") == False
print("All test cases for is_valid_username passed!")
```



```
PS C:\Users\HP\Desktop\AI-Lab> & C:/Users/HP/AppData/Local/Programs/Python/Python313/python.exe c:/Users/HP/Desktop/AI-Lab/doctestcases.py
All test cases for is_valid_username passed!
PS C:\Users\HP\Desktop\AI-Lab>
```

Task – 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:

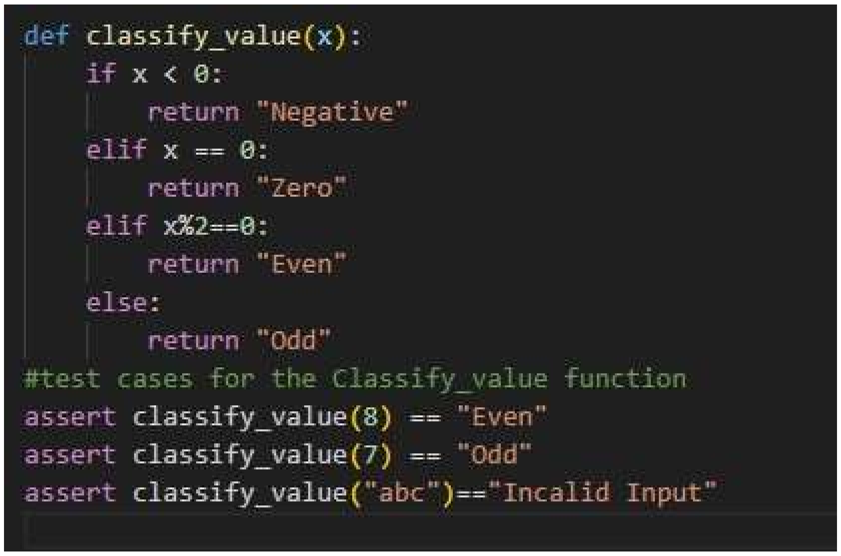
assert classify_value(8) == "Even" assert

classify_value(7) == "Odd" assert

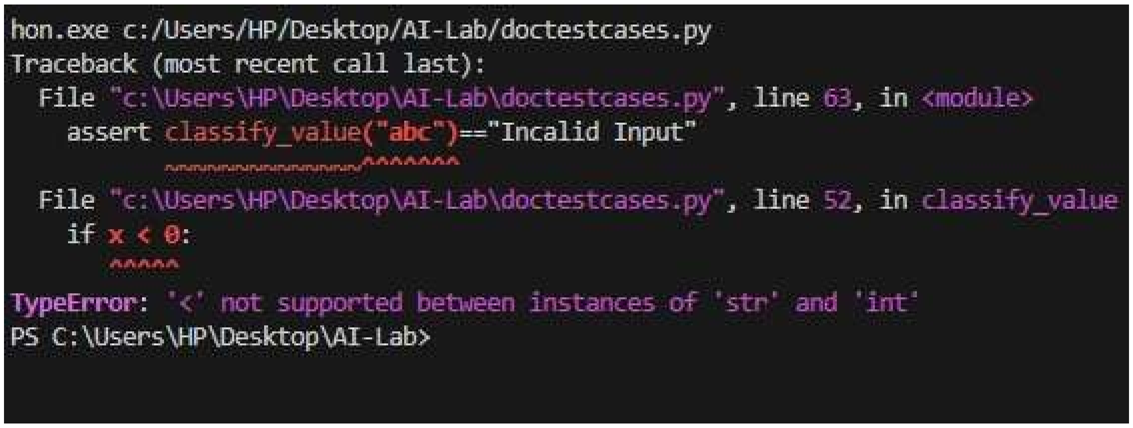
classify_value("abc") == "Invalid Input"

Expected Output #2:

• Function correctly classifying values and passing all test cases



```
def classify_value(x):
    if x < 0:
        return "Negative"
    elif x == 0:
        return "Zero"
    elif x%2==0:
        return "Even"
    else:
        return "Odd"
#test cases for the Classify_value function
assert classify_value(8) == "Even"
assert classify_value(7) == "Odd"
assert classify_value("abc")=="Incalid Input"
```



```
hon.exe c:/Users/HP/Desktop/AI-Lab/doctestcases.py
Traceback (most recent call last):
  File "c:\Users\HP\Desktop\AI-Lab\doctestcases.py", line 63, in <module>
    assert classify_value("abc")=="Incalid Input"
           ^^^^^^^^^^^^^^^^^^^^^
  File "c:\Users\HP\Desktop\AI-Lab\doctestcases.py", line 52, in classify_value
    if x < 0:
       ^^^^^
TypeError: '<' not supported between instances of 'str' and 'int'
PS C:\Users\HP\Desktop\AI-Lab>
```

Task – 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:

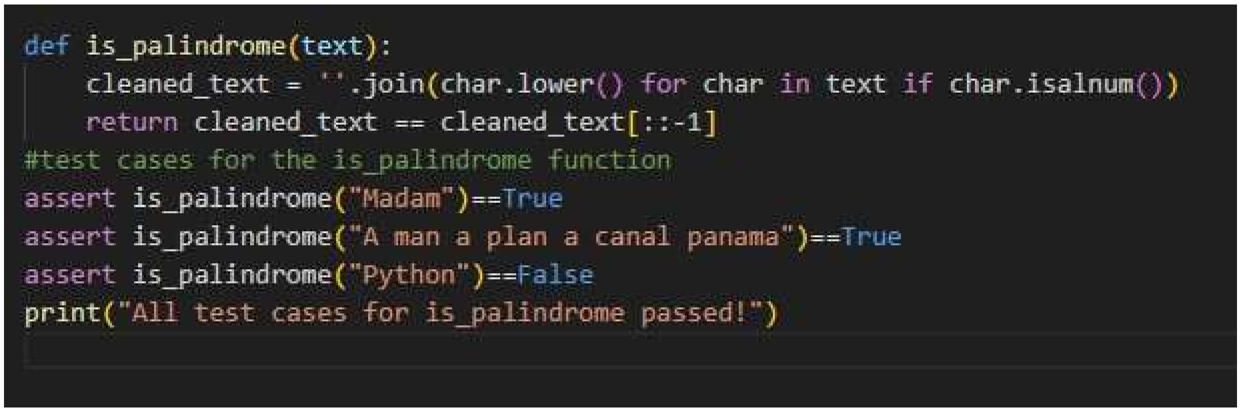
assert is_palindrome("Madam") == True assert

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

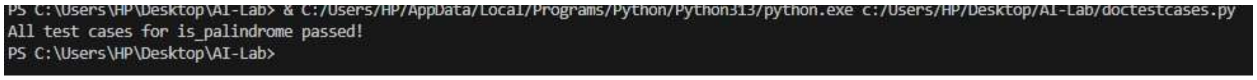
assert is_palindrome("Python") == False

Expected Output #3:

Function correctly identifying palindromes and passing all AI-generated tests



```
def is_palindrome(text):
    cleaned_text = ''.join(char.lower() for char in text if char.isalnum())
    return cleaned_text == cleaned_text[::-1]
#test cases for the is_palindrome function
assert is_palindrome("Madam")==True
assert is_palindrome("A man a plan a canal panama")==True
assert is_palindrome("Python")==False
print("All test cases for is_palindrome passed!")
```



```
PS C:\Users\HP\Desktop\AI-Lab> & C:/Users/HP/AppData/Local/Programs/Python/Python313/python.exe c:/Users/HP/Desktop/AI-Lab/doctestcases.py
All test cases for is_palindrome passed!
PS C:\Users\HP\Desktop\AI-Lab>
```

Task – 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: deposit(amount) o

withdraw(amount) get_balance()

Example Assert Test Cases: acc =

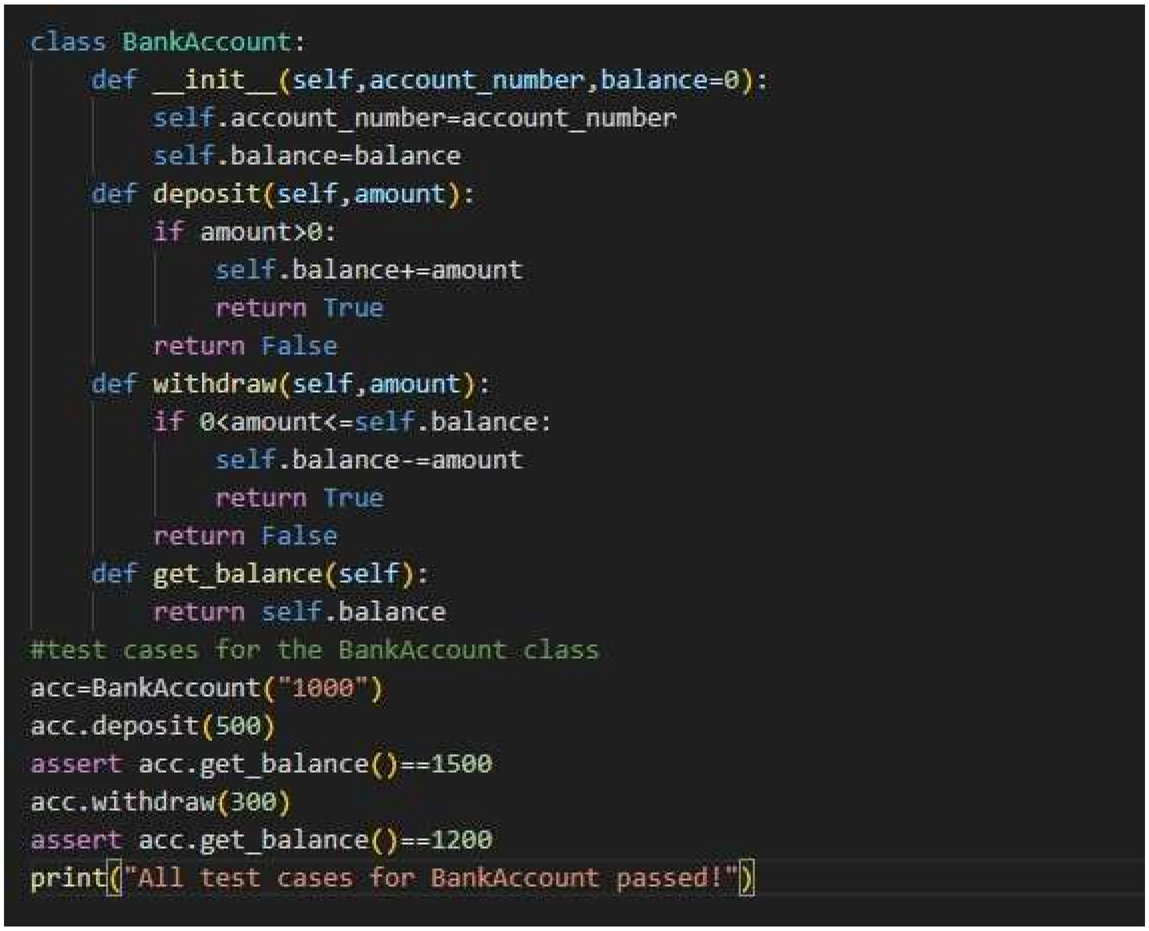
BankAccount(1000) acc.deposit(500) assert

acc.get_balance() == 1500 acc.withdraw(300)

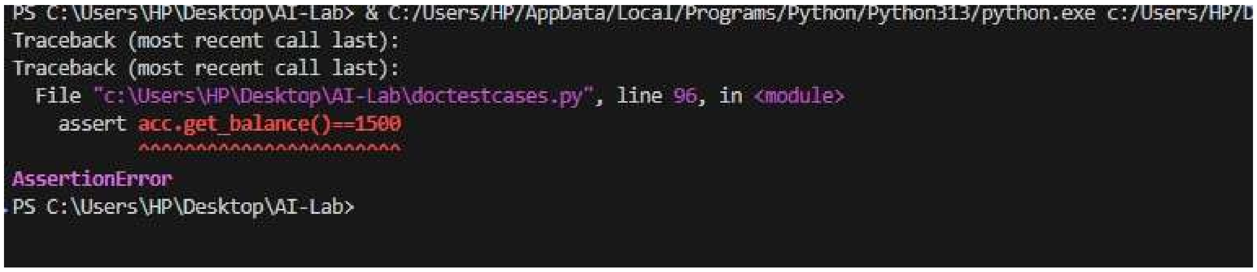
assert acc.get_balance() == 1200

Expected Output #4:

Fully functional class that passes all AI-generated assertions.



```
class BankAccount:
    def __init__(self,account_number,balance=0):
        self.account_number=account_number
        self.balance=balance
    def deposit(self,amount):
        if amount>0:
            self.balance+=amount
            return True
        return False
    def withdraw(self,amount):
        if 0<amount<=self.balance:
            self.balance-=amount
            return True
        return False
    def get_balance(self):
        return self.balance
#test cases for the BankAccount class
acc=BankAccount("1000")
acc.deposit(500)
assert acc.get_balance()==1500
acc.withdraw(300)
assert acc.get_balance()==1200
print("All test cases for BankAccount passed!")
```



```
PS C:\Users\HP\Desktop\AI-Lab> & C:/Users/HP/AppData/Local/Programs/Python/Python313/python.exe c:/Users/HP/D
Traceback (most recent call last):
Traceback (most recent call last):
  File "c:\Users\HP\Desktop\AI-Lab\doctestcases.py", line 96, in <module>
    assert acc.get_balance()==1500
           ^^^^^^^^^^^^^^^^^^^^^^^
AssertionError
PS C:\Users\HP\Desktop\AI-Lab>
```

Task – 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:

Must contain @ and .

Must not start or end with special characters.

Should handle invalid formats gracefully.

Example Assert Test Cases:

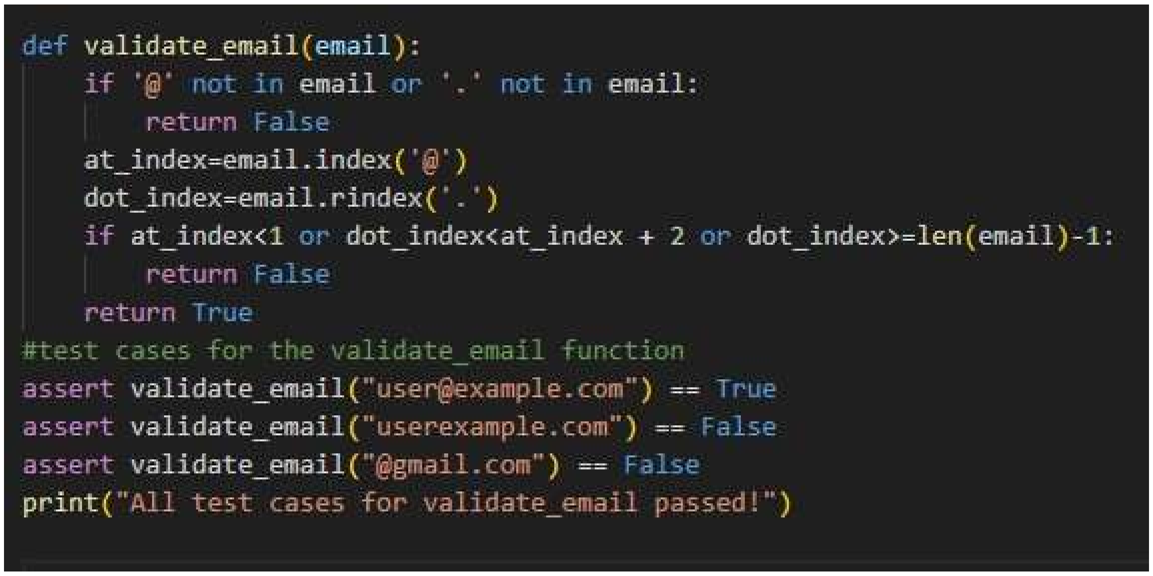
assert validate_email("user@example.com") == True

assert validate_email("userexample.com") == False assert

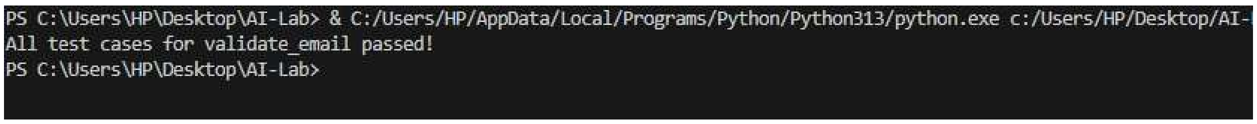
validate_email("@gmail.com") == False

Expected Output #5

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



```python
def validate_email(email):
    if '@' not in email or '.' not in email:
        return False
    at_index=email.index('@')
    dot_index=email.rindex('.')
    if at_index<1 or dot_index<at_index + 2 or dot_index>=len(email)-1:
        return False
    return True
#test cases for the validate_email function
assert validate_email("user@example.com") == True
assert validate_email("userexample.com") == False
assert validate_email("@gmail.com") == False
print("All test cases for validate_email passed!")
```



```
PS C:\Users\HP\Desktop\AI-Lab> & C:/Users/HP/AppData/Local/Programs/Python/Python313/python.exe c:/Users/HP/Desktop/AI-
All test cases for validate_email passed!
PS C:\Users\HP\Desktop\AI-Lab>
```