

## Assignment-8.5

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Batch-24

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.

```
1 def is_valid_username(username):
2     if len(username) < 5 or len(username) > 15:
3         return False
4     if not username[0].isalpha():
5         return False
6     for char in username:
7         if not (char.isalnum() or char == '_'):
8             return False
9     return True
10 #test cases for the is_valid_username function
11 assert is_valid_username("User123") == True
12 assert is_valid_username("12User") == False
13 assert is_valid_username("Us er") == False
14 print("All test cases for is_valid_username passed!")
```

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PS C:\Users\BHARGAV> & C:/Users/BHARGAV/AppData/Local/Programs/Python/Python314/python.exe "c:/Users/BHARGAV/Documents/3yr-2nd sem/AI-3.2/Assg-8.5/"  
All test cases for is\_valid\_username passed!  
PS C:\Users\BHARGAV>

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

```

16 def classify_value(x):
17     if x < 0:
18         return "Negative"
19     elif x == 0:
20         return "Zero"
21     elif x%2 == 0:
22         return "Even"
23     else:
24         return "Odd"
25 # Test cases for the classify_value function
26 assert classify_value(8) == "Even"
27 assert classify_value(7) == "Odd"
28 assert classify_value("abc") == "Invalid Input"

```

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```

PS C:\Users\BHARGAV> & C:/Users/BHARGAV/AppData/Local/Programs/Python/Python314/python.exe "c:/Users/BHARGAV/Documents/3yr-2nd sem/AI-3.2/Assg-8.5/Untitled-1.
Traceback (most recent call last):
  File "c:/Users/BHARGAV/Documents/3yr-2nd sem/AI-3.2/Assg-8.5/Untitled-1.py", line 28, in <module>
    assert classify_value("abc") == "Invalid Input"
    ~~~~~^~~~~~
  File "c:/Users/BHARGAV/Documents/3yr-2nd sem/AI-3.2/Assg-8.5/Untitled-1.py", line 17, in classify_value
    if x < 0:
    ~~~~^
TypeError: '<' not supported between instances of 'str' and 'int'
PS C:\Users\BHARGAV>

```

### 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

```

30
31 def is_palindrome(text):
32     cleaned_text = ''.join(char.lower() for char in text if char.isalnum())
33     return cleaned_text == cleaned_text[::-1]
34 # Test cases for the is_palindrome function
35 assert is_palindrome("Madam") == True
36 assert is_palindrome("A man a plan a canal Panama") == True
37 assert is_palindrome("Python") == False
38 print("All test cases for is_palindrome passed!")
39

```

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```

PS C:\Users\BHARGAV> & c:/Users/BHARGAV/AppData/Local/Programs/Python/Python314/python.exe "c:/Users/BHARGAV/Documents/3yr-2nd sem/AI-3.2/Assg-8.5/Untitled-1.py"
All test cases for is_palindrome passed!
PS C:\Users\BHARGAV>

```

### 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.

```
41 class BankAccount:
42     def __init__(self, account_number, balance=0):
43         self.account_number = account_number
44         self.balance = balance
45
46     def deposit(self, amount):
47         if amount > 0:
48             self.balance += amount
49             return True
50         return False
51
52     def withdraw(self, amount):
53         if 0 < amount <= self.balance:
54             self.balance -= amount
55             return True
56         return False
57     def get_balance(self):
58         return self.balance
59 # Test cases for the BankAccount class
60 acc = BankAccount(1000)
61 acc.deposit(500)
62 assert acc.get_balance() == 1500
63 acc.withdraw(300)
64 assert acc.get_balance() == 1200
65 print("All test cases for BankAccount passed!")
66
```

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PS C:\Users\BHARGAV> & C:\Users\BHARGAV\AppData\Local\Programs\Python\Python314\python.exe "c:\Users\BHARGAV\Documents\3yr-2nd sem\AI-3.2\Assg-8.5\Untitled-1.py"
Traceback (most recent call last):
 File "c:\Users\BHARGAV\Documents\3yr-2nd sem\AI-3.2\Assg-8.5\Untitled-1.py", line 62, in <module>
 assert acc.get\_balance() == 1500
 ^^^^^^^^^^^^^^^^^^^^^^^^^
AssertionError
PS C:\Users\BHARGAV>

### 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.

```
67 def validate_email(email):
68     if '@' not in email or '.' not in email:
69         return False
70     at_index = email.index('@')
71     dot_index = email.rindex('.')
72     if at_index < 1 or dot_index < at_index + 2 or dot_index >= len(email) - 1:
73         return False
74     return True
75 # Test cases for the validate_email function
76 assert validate_email("user@example.com") == True
77 assert validate_email("userexample.com") == False
78 assert validate_email("@gmail.com") == False
79 print("All test cases for validate_email passed!")
80
```

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```
PS C:\Users\BHARGAV> & C:/Users/BHARGAV/AppData/Local/Programs/Python/Python314/python.exe "c:/Users/BHARGAV/Documents/3yr-2nd sem/AI-3.2/Assg-8.
All test cases for validate_email passed!
PS C:\Users\BHARGAV>
```