

ASSIGNMENT-8.2

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Batch – 29

Task 1 – Test-Driven Development for Even/Odd Number Validator

Prompt :

Generate test cases for a function `is_even(n)` and then implement the function and print output using Assert test cases.

CODE:

```
Assignment_8.2.py > ...
1  #generate test cases for a function is_even(n) and then implement the function and print output using Assert test cases
2  def is_even(n):
3      return n % 2 == 0
4  # Test cases
5  assert is_even(4) == True, "Test case 1 failed"
6  assert is_even(7) == False, "Test case 2 failed"
7  assert is_even(0) == True, "Test case 3 failed"
8  assert is_even(-2) == True, "Test case 4 failed"
9  assert is_even(-3) == False, "Test case 5 failed"
10 print("All test cases passed!")
11
```

OUTPUT:

- PS C:\Users\hp\OneDrive\Desktop\AI_Assisted_Coding> c:; cd 'c:\Users\hp\OneDrive\Desktop\AI_Assisted_Coding\Assignment_8.2.py'
All test cases passed!
- PS C:\Users\hp\OneDrive\Desktop\AI_Assisted_Coding>

JUSTIFICATION:

In this task, I used assert statements to test the `is_even()` function before finalizing the implementation. I checked positive numbers, negative numbers, and zero. The assert tests helped me verify correctness quickly. If any test failed, Python showed an error immediately. This made debugging simple and effective.

Task 2 – Test-Driven Development for String Case Converter

Prompt :

Generate test cases for two functions: `to_uppercase(text)` ,`to_lowercase(text)` using assert test cases.

CODE:

```
13
14     #generate test cases for two functions: to_uppercase(text) ,to_lowercase(text) using assert test cases
15     def to_uppercase(text):
16         return text.upper()
17     def to_lowercase(text):
18         return text.lower()
19     # Test cases for to_uppercase
20     assert to_uppercase("hello") == "HELLO", "Test case 1 failed for to_uppercase"
21     assert to_uppercase("Python") == "PYTHON", "Test case 2 failed for to_uppercase"
22     assert to_uppercase("123") == "123", "Test case 3 failed for to_uppercase"
23     # Test cases for to_lowercase
24     assert to_lowercase("HELLO") == "hello", "Test case 1 failed for to_lowercase"
25     assert to_lowercase("Python") == "python", "Test case 2 failed for to_lowercase"
26     assert to_lowercase("123") == "123", "Test case 3 failed for to_lowercase"
27     print("All test cases passed for both functions!")
```

OUTPUT:

```
PS C:\Users\hp\OneDrive\Desktop\AI_Assisted_Coding> c;; cd 'c:\Users\hp\OneDrive\13\python.exe' 'c:\Users\hp\.vscode\extensions\ms-python.debugpy-2025.18.0-win32->_Assisted_Coding\Assignment_8.2.py'
● All test cases passed for both functions!
```

JUSTIFICATION:

I used assert statements to test both `to_uppercase()` and `to_lowercase()` functions. I tested normal strings, mixed-case strings, empty strings, and invalid inputs. The assertions ensured that the functions returned correct results. This approach helped me handle edge cases properly and improve code reliability.

Task 3 - Test-Driven Development for List Sum Calculator

Prompt :

Generate test cases for a function `sum_list(numbers)` that calculates the sum of list elements.

CODE:

```
26  
27     #generate test cases for a function sum_list(numbers) that calculates the sum of list elements.  
28 def sum_list(numbers):  
29     return sum(numbers)  
30  
31     # Test cases  
32 assert sum_list([1, 2, 3]) == 6, "Test case 1 failed"  
33 assert sum_list([-1, 0, 1]) == 0, "Test case 2 failed"  
34 assert sum_list([]) == 0, "Test case 3 failed"  
35 assert sum_list([10, 20, 30]) == 60, "Test case 4 failed"  
36  
37 print("All test cases passed for sum_list function!")  
38  
39
```

OUTPUT:

```
● PS C:\Users\hp\OneDrive\Desktop\AI_Assited_Coding> c:; cd 'c:\Users\hp\OneDrive\Desktop\python.exe' 'c:\Users\hp\.vscode\extensions\ms-python.debugpy-2025.18.0-win32-x64\Assisted_Coding\Assignment_8.2.py'  
All test cases passed for sum_list function!  
○ PS C:\Users\hp\OneDrive\Desktop\AI_Assited_Coding>
```

JUSTIFICATION:

For this task, I wrote assert test cases to check different scenarios like empty lists, negative numbers, and non-numeric values. The assertions confirmed whether the function calculated the correct sum. If any test failed, it showed an immediate error. This helped me build a more robust and safe function.

Task 4 - Test Cases for Student Result Class

Prompt :

Generate test cases for a StudentResult class with the following methods: add_marks(mark) ,calculate_average(),get_result() using assert test .

CODE:

```

40 #Generate test cases for a StudentResult class with the following methods: add_marks(mark) ,calculate_average(),get_result() using assert statements
41 class StudentResult:
42     def __init__(self):
43         self.marks = []
44     def add_marks(self, mark):
45         self.marks.append(mark)
46     def calculate_average(self):
47         if not self.marks:
48             return 0
49         return sum(self.marks) / len(self.marks)
50     def get_result(self):
51         average = self.calculate_average()
52         if average >= 90:
53             return "A"
54         elif average >= 80:
55             return "B"
56         elif average >= 70:
57             return "C"
58         else:
59             return "F"
60     # Test cases
61 student = StudentResult()
62 student.add_marks(85)
63 student.add_marks(90)
64 assert student.calculate_average() == 87.5, "Test case 1 failed for calculate_average"
65 assert student.get_result() == "B", "Test case 1 failed for get_result"
66 student.add_marks(95)
67 assert student.calculate_average() == 90, "Test case 2 failed for calculate_average"
68 assert student.get_result() == "A", "Test case 2 failed for get_result"
69 student.add_marks(70)
70 assert student.calculate_average() == 88.33, "Test case 3 failed for calculate_average"
71 assert student.get_result() == "C", "Test case 3 failed for get_result"
72 print("All test cases passed for StudentResult class!")

```

OUTPUT:

```

13\python.exe' 'c:\Users\hp\.vscode\extensions\ms-python.debugpy-2025.18.0-win32-x64\bundled\libs
 _Assisted_Coding\Assignment_8.2.py'
All test cases passed for StudentResult class!
○ PS C:\Users\hp\OneDrive\Desktop\AI Assisted Coding> ┌

```

JUSTIFICATION:

I used assert statements to test average calculation and Pass/Fail logic. I verified that marks were within the valid range and handled invalid inputs. The test cases ensured that the class methods worked correctly. Using assertions made it easy to validate the logic step by step.

Task 5 - Test-Driven Development for Username Validator

Prompt :

Generate a python code to Test-Driven Development for Username Validator
 Requirements: Minimum length: 5 characters, No spaces allowed, Only alphanumeric characters using assert test cases

CODE:

```

82
83 #Generate a python code to Test-Driven Development for Username Validator
84 # Requirements:
85 # • Minimum length: 5 characters
86 # • No spaces allowed
87 # • Only alphanumeric characters
88 # Example Test Scenarios:
89 # is_valid_username("user01") → True
90 # is_valid_username("ai") → False
91 # is_valid_username("user name") → False
92 # is_valid_username("user@123") → False
93 # Expected Output 5
94 # A username validation function that passes all AI-generated test cases using assert test cases.
95 def is_valid_username(username):
96     if len(username) < 5:
97         return False
98     if " " in username:
99         return False
100    if not username.isalnum():
101        return False
102    return True
103 # Test cases
104 assert is_valid_username("user01") == True, "Test case 1 failed"
105 assert is_valid_username("ai") == False, "Test case 2 failed"
106 assert is_valid_username("user name") == False, "Test case 3 failed"
107 assert is_valid_username("user@123") == False, "Test case 4 failed"
108 assert is_valid_username("validUser") == True, "Test case 5 failed"
109 print("All test cases passed for is_valid_username function!")

```

OUTPUT:

```

● PS C:\Users\hp\OneDrive\Desktop\AI_Assisted_Coding> c:; cd 'c:\Users\hp\OneDrive\D
13\python.exe' 'c:\Users\hp\.vscode\extensions\ms-python.debugpy-2025.18.0-win32-x
_Assisted_Coding\Assignment_8.2.py'
All test cases passed for StudentResult class!
All test cases passed for is valid username function!

```

JUSTIFICATION:

In this task, I used assert statements to test username validation rules. I checked minimum length, no spaces, and only alphanumeric characters. The assertions helped confirm that valid usernames passed and invalid ones failed. This improved my understanding of input validation and testing logic.