



School of Computer Science and Artificial Intelligence

Lab Assignment-8.1

Course Name : **AI Assistant Coding**
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Batch No : **47-B**

Task Description #1 (Password Strength Validator – Apply AI in Security Context)

Task: Apply AI to generate at least 3 assert test cases for `is_strong_password(password)` and implement the validator function.

Requirements:

Password must have at least 8 characters.

Must include uppercase, lowercase, digit, and special character.

Must not contain spaces.

Example Assert Test Cases:

```
assert is_strong_password("Abcd@123") == True
```

```
assert is_strong_password("abcd123") == False
```

```
assert is_strong_password("ABCD@1234") == True
```

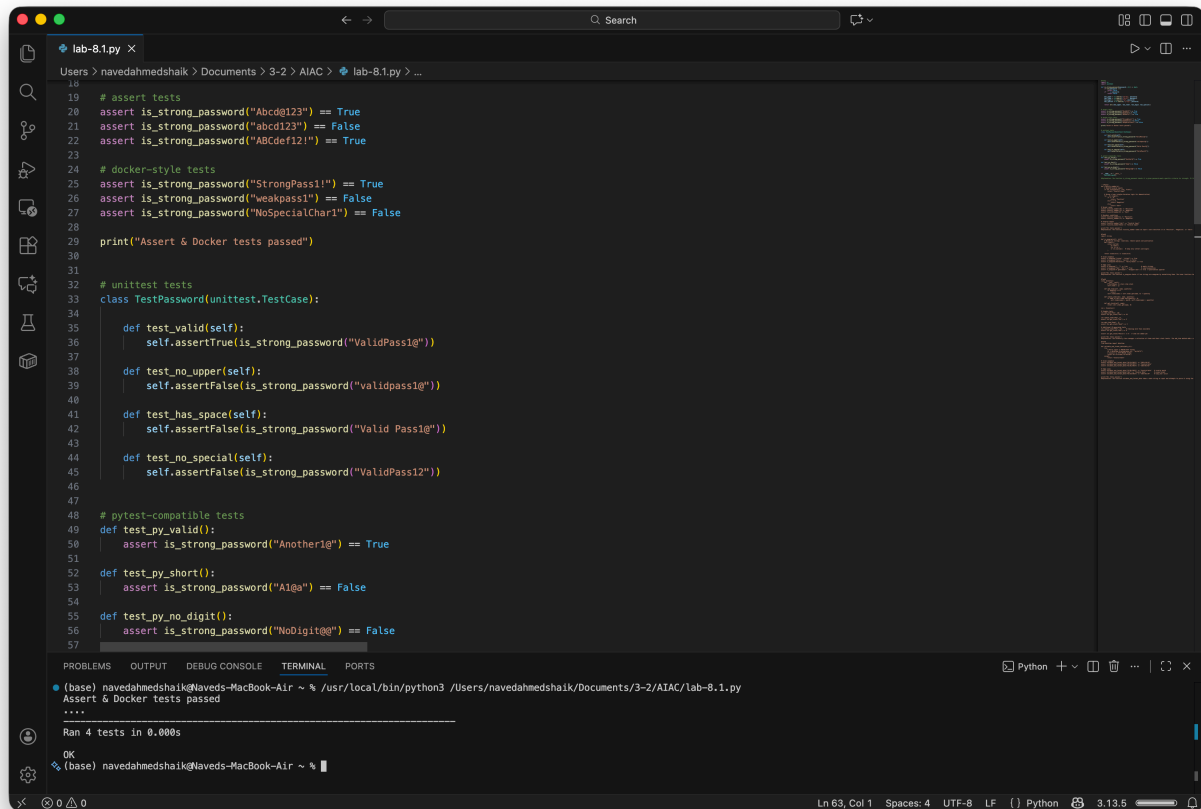
Expected Output #1:

Password validation logic passing all AI-generated test cases.

EXPLANATION:

The function `is_strong_password` checks if a given password meets specific strength criteria. It first checks if the password is at least 8 characters long and does not contain any spaces. Then, it uses regular expressions to check for the presence of at least one uppercase letter, one lowercase letter, one digit, and one special character. The assert statements test the function with various passwords to ensure it correctly identifies strong and weak passwords based on the defined criteria.

SCREENSHOT OF GENERATED CODE:



```
18
19 # assert tests
20 assert is_strong_password("Abcd123") == True
21 assert is_strong_password("abcd123") == False
22 assert is_strong_password("ABcd12!") == True
23
24 # docker-style tests
25 assert is_strong_password("StrongPass1!") == True
26 assert is_strong_password("weakpass1") == False
27 assert is_strong_password("NoSpecialChar1") == False
28
29 print("Assert & Docker tests passed")
30
31
32 # unittest tests
33 class TestPassword(unittest.TestCase):
34
35     def test_valid(self):
36         self.assertTrue(is_strong_password("ValidPass1@"))
37
38     def test_no_upper(self):
39         self.assertFalse(is_strong_password("validpass1@"))
40
41     def test_has_space(self):
42         self.assertFalse(is_strong_password("Valid Pass1@"))
43
44     def test_no_special(self):
45         self.assertFalse(is_strong_password("ValidPass12"))
46
47
48 # pytest-compatible tests
49 def test_py_valid():
50     assert is_strong_password("Another1@") == True
51
52 def test_py_short():
53     assert is_strong_password("A1@a") == False
54
55 def test_py_no_digit():
56     assert is_strong_password("NoDigit@") == False
57
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

(base) navedahmedshaik@Naveds-MacBook-Air ~ % /usr/local/bin/python3 /Users/naledahmedshaik/Documents/3-2/AIAC/lab-8.1.py

Assert & Docker tests passed

....

Ran 4 tests in 0.000s

OK

(base) navedahmedshaik@Naveds-MacBook-Air ~ %

Task Description #2 (Number Classification with Loops – Apply AI for Edge Case Handling)

Task: Use AI to generate at least 3 assert test cases for a `classify_number(n)` function. Implement using loops.

Requirements:

Classify numbers as Positive, Negative, or Zero.

Handle invalid inputs like strings and None.

Include boundary conditions (-1, 0, 1).

Example Assert Test Cases:

```
assert classify_number(10) == "Positive"
```

```
assert classify_number(-5) == "Negative"
```

```
assert classify_number(0) == "Zero"
```

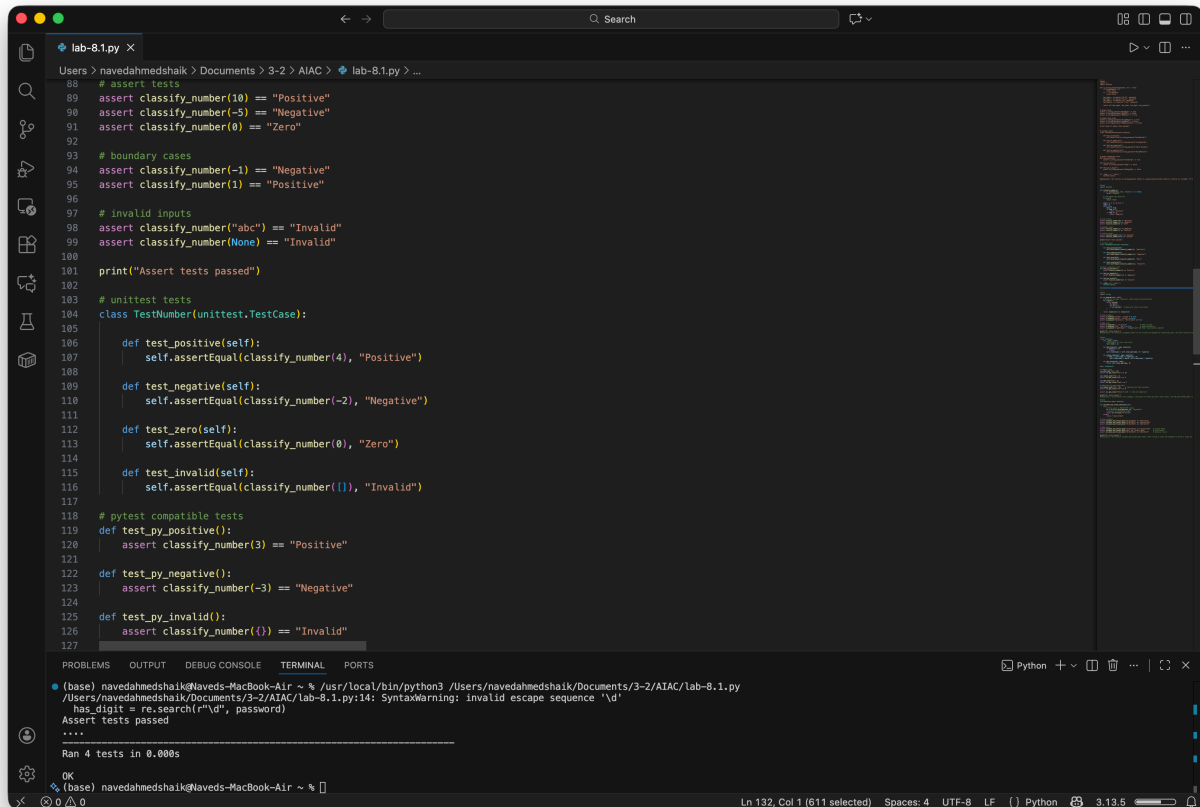
Expected Output #2:

Classification logic passing all assert tests.

EXPLANATION:

The function `classify_number` determines if a given input is a positive number, negative number, zero, or invalid. It first checks if the input is an instance of `int` or `float` and not `None`. If the input is valid, it uses a loop to determine the sign of the number by incrementing or decrementing a temporary variable until it reaches 1 or -1. The assert statements test the function with various inputs, including valid numbers and invalid types. The unittest class provides structured tests for different scenarios, while the pytest-compatible functions allow for additional testing in a more flexible manner.

SCREENSHOT OF GENERATED CODE:



```
lab-8.1.py x
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88 # assert tests
89 assert classify_number(10) == "Positive"
90 assert classify_number(-5) == "Negative"
91 assert classify_number(0) == "Zero"
92
93 # boundary cases
94 assert classify_number(-1) == "Negative"
95 assert classify_number(1) == "Positive"
96
97 # invalid inputs
98 assert classify_number("abc") == "Invalid"
99 assert classify_number(None) == "Invalid"
100
101 print("Assert tests passed")
102
103 # unittest tests
104 class TestNumber(unittest.TestCase):
105
106     def test_positive(self):
107         self.assertEqual(classify_number(4), "Positive")
108
109     def test_negative(self):
110         self.assertEqual(classify_number(-2), "Negative")
111
112     def test_zero(self):
113         self.assertEqual(classify_number(0), "Zero")
114
115     def test_invalid(self):
116         self.assertEqual(classify_number([]), "Invalid")
117
118 # pytest compatible tests
119 def test_py_positive():
120     assert classify_number(3) == "Positive"
121
122 def test_py_negative():
123     assert classify_number(-3) == "Negative"
124
125 def test_py_invalid():
126     assert classify_number({}) == "Invalid"
127
128
129 PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
130
131 (base) navedahmedshaik@Naveds-MacBook-Air ~ % /usr/local/bin/python3 /Users/na...
132 /Users/na.../Documents/3-2/AIAC/lab-8.1.py:14: SyntaxWarning: invalid escape sequence '\d'
133   has_digit = re.search(r"\d", password)
134 Assert tests passed
135 ....
136 Ran 4 tests in 0.000s
137
138 OK
139 (base) navedahmedshaik@Naveds-MacBook-Air ~ %
```

Task Description #3 (Anagram Checker – Apply AI for String Analysis)

Task: Use AI to generate at least 3 assert test cases for `is_anagram(str1, str2)` and implement the function.

Requirements:

Ignore case, spaces, and punctuation.

Handle edge cases (empty strings, identical words).

Example Assert Test Cases:

`assert is_anagram("listen", "silent") == True`

`assert is_anagram("hello", "world") == False`

`assert is_anagram("Dormitory", "Dirty Room") == True`

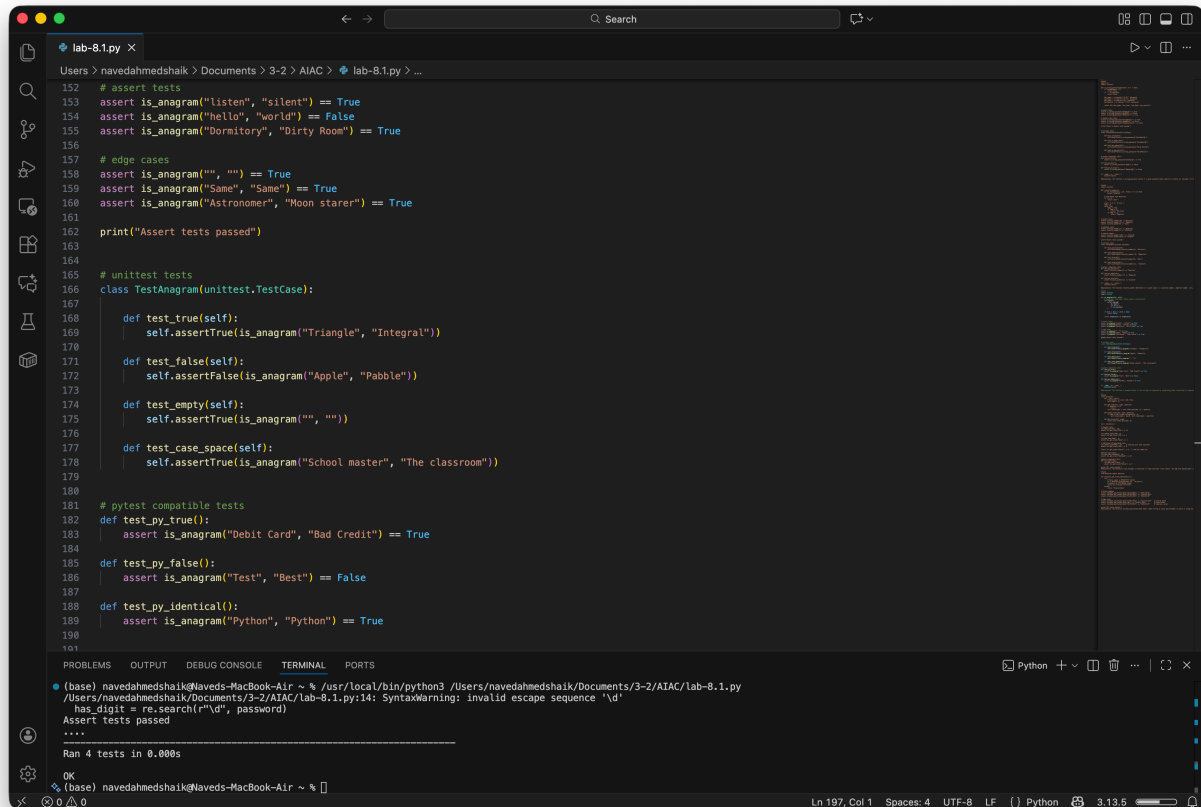
Expected Output #3:

Function correctly identifying anagrams and passing all AI-generated tests

EXPLANATION:

The function `is_anagram` checks if two strings are anagrams by normalizing them (converting to lowercase and removing spaces and punctuation) and then comparing the sorted characters. If the sorted characters of both strings are the same, they are anagrams. The assert statements test the function with various pairs of strings, including edge cases like empty strings and identical strings. The unittest class provides structured tests for different scenarios, while the pytest-compatible functions allow for additional testing in a more flexible manner.

SCREENSHOT OF GENERATED CODE:



Task Description #4 (Inventory Class – Apply AI to Simulate Real-World Inventory System)

Task: Ask AI to generate at least 3 assert-based tests for an Inventory class with stock management.

Methods:

```
add item(name, quantity)
```

remove_item(name, quantity)

get stock(name)

Example Assert Test Cases:

inv = Inventory()

```
inv.add_item("Pen", 10)
```

```
assert inv.get_stock("Pen") == 10
```

```
inv.remove item("Pen", 5)
```

```
assert inv.get_stock("Pen") == 5
```

```
inv.add item("Book", 3)
```

```
assert inv.get_stock("Book") == 3
```

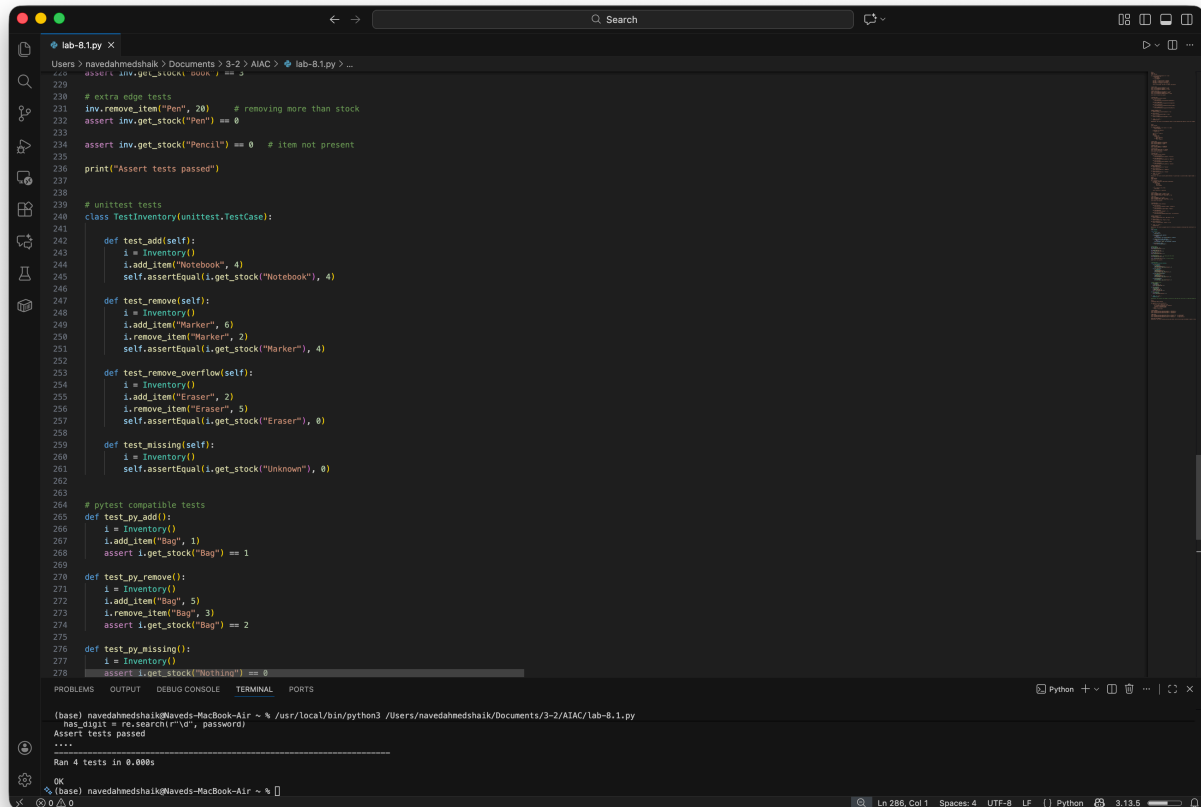
Expected Output #4:

Fully functional class passing all assertions.

EXPLANATION:

The Inventory class manages a simple stock system where you can add items, remove items, and check the stock of an item. The `add_item` method increases the stock of a given item by a specified quantity, while the `remove_item` method decreases the stock but ensures it does not go below zero. The `get_stock` method returns the current stock of an item or zero if the item is not present. The assert statements test the functionality of adding and removing items, as well as edge cases like removing more than the available stock and checking for items that do not exist. The unittest class provides structured tests for different scenarios, while the pytest-compatible functions allow for additional testing in a more flexible manner.

SCREENSHOT OF GENERATED CODE:

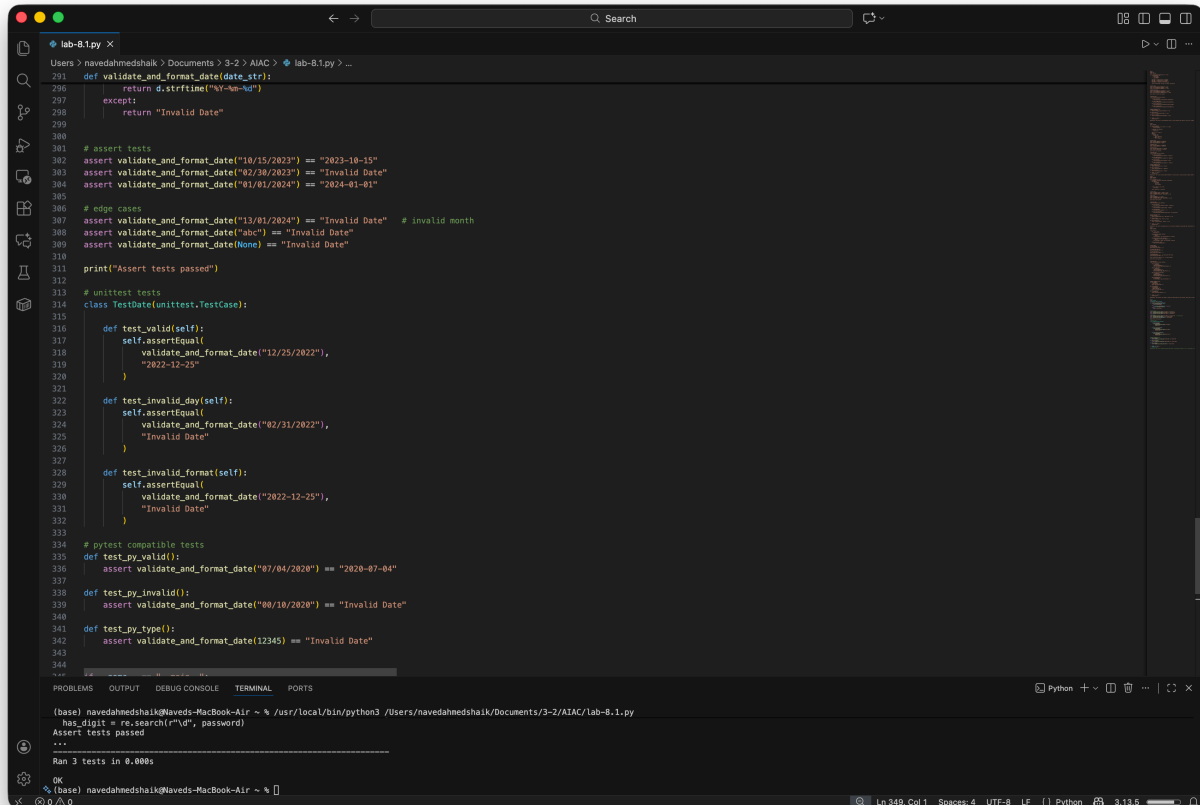


```
lab-8.1.py X
Users > navedahmedhaik > Documents > 3-2 > AIAC > lab-8.1.py > ...
220 assert inv.get_stock('Pen') == 4
221
222 # extra edge tests
223 inv.remove_item("Pen", 20) # removing more than stock
224 assert inv.get_stock("Pen") == 0
225
226 assert inv.get_stock("Pencil") == 0 # item not present
227
228 print("Assert tests passed")
229
230 # unittest tests
231 class TestInventory(unittest.TestCase):
232
233     def test_add(self):
234         i = Inventory()
235         i.add_item("Notebook", 4)
236         self.assertEqual(i.get_stock("Notebook"), 4)
237
238     def test_remove(self):
239         i = Inventory()
240         i.add_item("Marker", 6)
241         i.remove_item("Marker", 2)
242         self.assertEqual(i.get_stock("Marker"), 4)
243
244     def test_remove_overflow(self):
245         i = Inventory()
246         i.add_item("Eraser", 2)
247         i.remove_item("Eraser", 5)
248         self.assertEqual(i.get_stock("Eraser"), 0)
249
250     def test_missing(self):
251         i = Inventory()
252         self.assertEqual(i.get_stock("Unknown"), 0)
253
254 # pytest compatible tests
255 def test_py_add():
256     i = Inventory()
257     i.add_item("Bag", 1)
258     assert i.get_stock("Bag") == 1
259
260 def test_py_remove():
261     i = Inventory()
262     i.add_item("Bag", 5)
263     i.remove_item("Bag", 3)
264     assert i.get_stock("Bag") == 2
265
266 def test_py_missing():
267     i = Inventory()
268     assert i.get_stock("Nothing") == 0
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EXPLANATION:

The function `validate_and_format_date` takes a string input and checks if it is a valid date in the format "MM/DD/YYYY". It uses the `datetime` module to attempt to parse the date string. If parsing is successful, it returns the date in the format "YYYY-MM-DD". If parsing fails (due to an invalid date or incorrect format), it returns "Invalid Date". The `assert` statements test the function with various valid and invalid date strings, including edge cases. The `unittest` class provides structured tests for different scenarios, while the `pytest-compatible` functions allow for additional testing in a more flexible manner.

SCREENSHOT OF GENERATED CODE:



```
291 def validate_and_format_date(date_str):
292     return d.strftime("%Y-%m-%d")
293 except:
294     return "Invalid Date"
295
296
297 # assert tests
298 assert validate_and_format_date("10/15/2023") == "2023-10-15"
299 assert validate_and_format_date("02/30/2023") == "Invalid Date"
300 assert validate_and_format_date("01/01/2024") == "2024-01-01"
301
302 # edge cases
303 assert validate_and_format_date("13/01/2024") == "Invalid Date" # invalid month
304 assert validate_and_format_date("abc") == "Invalid Date"
305 assert validate_and_format_date(None) == "Invalid Date"
306
307 print("Assert tests passed")
308
309 # unittest tests
310 class TestDate(unittest.TestCase):
311
312     def test_valid(self):
313         self.assertEqual(
314             validate_and_format_date("12/25/2022"),
315             "2022-12-25"
316         )
317
318     def test_invalid_day(self):
319         self.assertEqual(
320             validate_and_format_date("02/31/2022"),
321             "Invalid Date"
322         )
323
324     def test_invalid_format(self):
325         self.assertEqual(
326             validate_and_format_date("2022-12-25"),
327             "Invalid Date"
328         )
329
330 # pytest compatible tests
331 def test_py_valid():
332     assert validate_and_format_date("07/04/2020") == "2020-07-04"
333
334 def test_py_invalid():
335     assert validate_and_format_date("00/10/2020") == "Invalid Date"
336
337 def test_py_type():
338     assert validate_and_format_date(12345) == "Invalid Date"
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PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

Python + + + + +

base navedahmedhaik@Naveds-MacBook-Air ~ % /usr/local/bin/python3 /Users/navedahmedhaik/Documents/3-2/AIAC/lab-8.1.py

has_dgit = research(-"d", password)

Assert tests passed

Ran 3 tests in 0.000s

OK

base navedahmedhaik@Naveds-MacBook-Air ~ %