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## Lab Assignment # 08

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### Lab 8: Test-Driven Development with AI – Generating and Working with Test Cases

#### 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:**

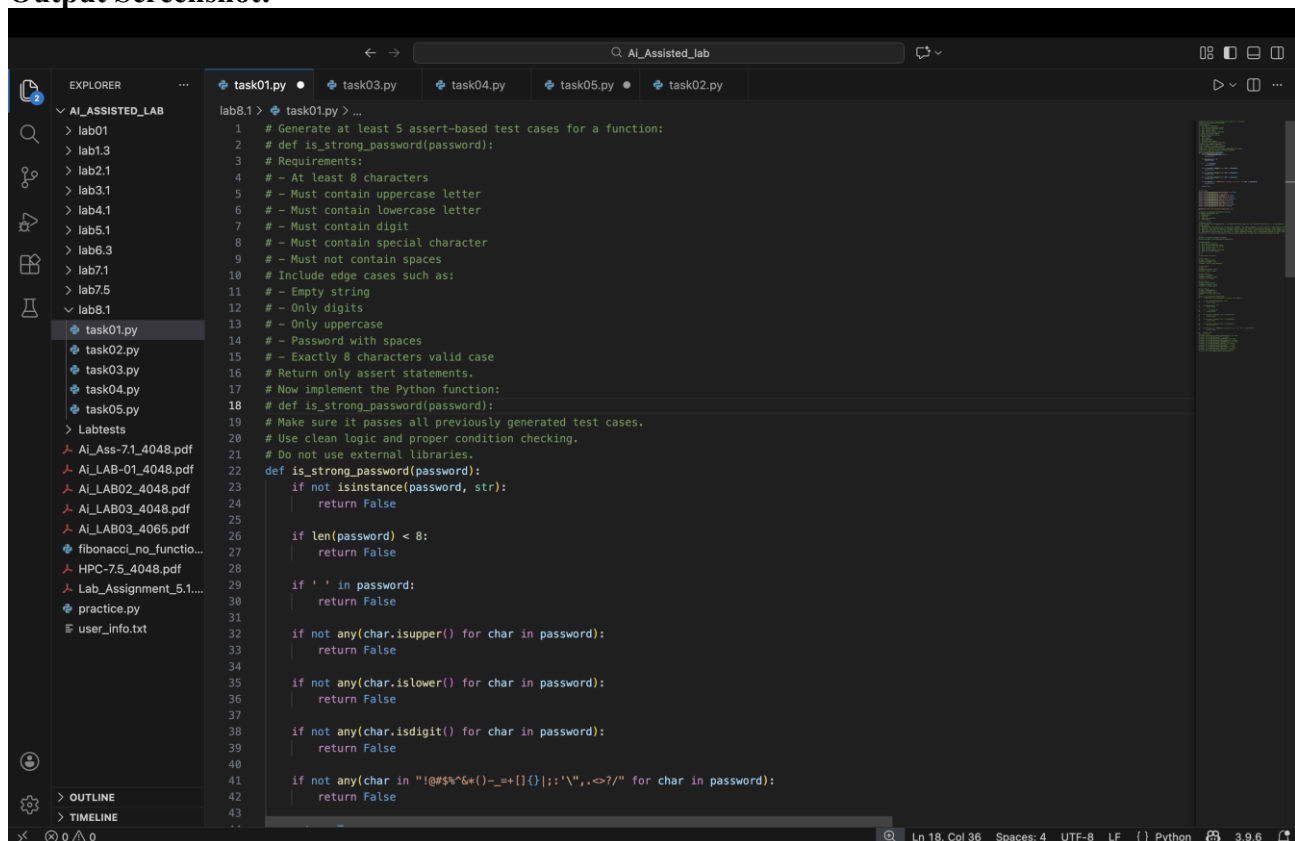
- o Password must have at least 8 characters.
- o Must include uppercase, lowercase, digit, and special character.
- o Must not contain spaces.

#### Example Assert Test Cases:

```
assert is_strong_password("Abcd@123") == True
assert is_strong_password("abcd123") == False
assert is_strong_password("ABCD@1234") == True
```

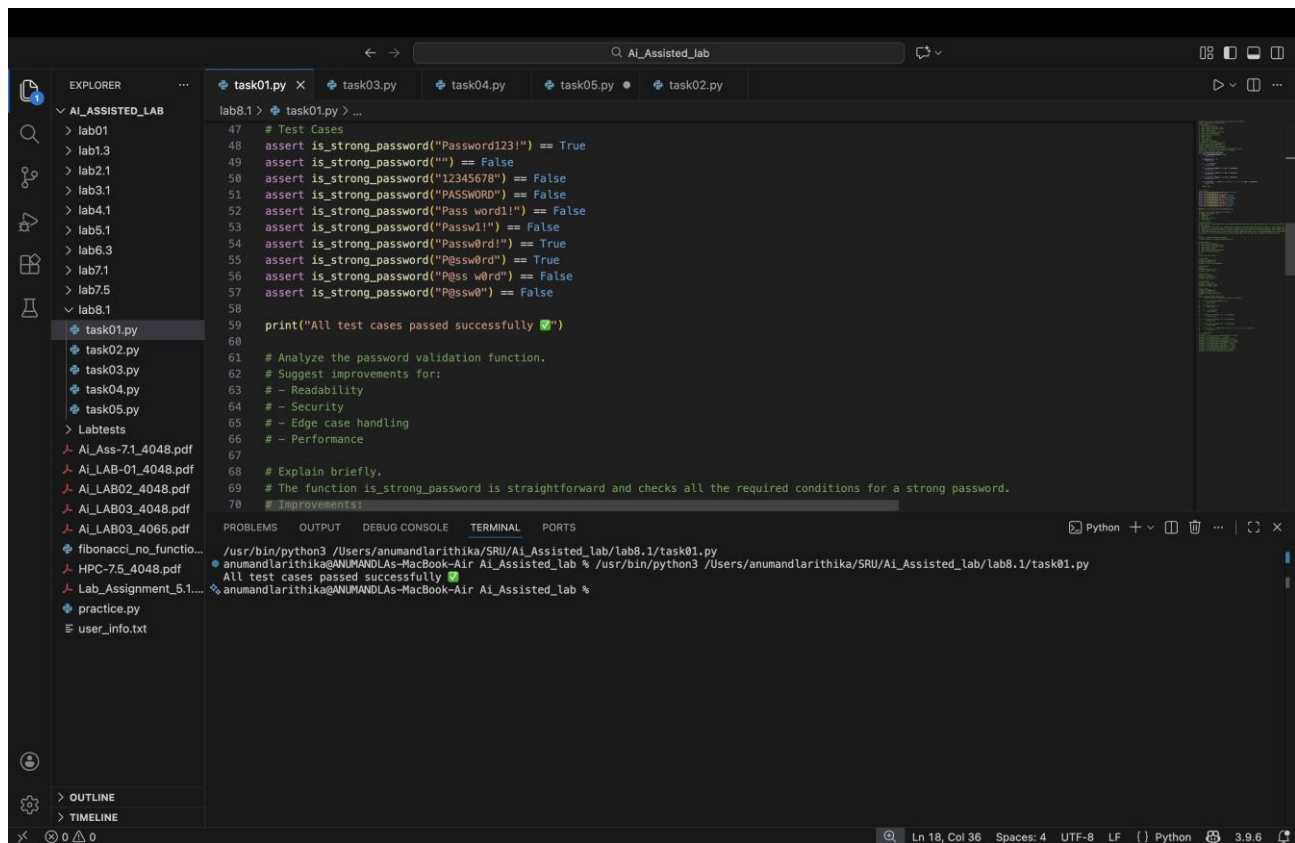
**Expected Output #1:** • Password validation logic passing all AI-generated test cases.

#### Output Screenshot:



The screenshot shows a code editor with a file explorer on the left and a code editor on the right. The file explorer shows a directory structure for 'AI\_ASSISTED\_LAB' with files like 'lab01', 'lab1.3', 'lab2.1', 'lab3.1', 'lab4.1', 'lab5.1', 'lab6.3', 'lab7.1', 'lab7.5', 'lab8.1', 'task01.py', 'task02.py', 'task03.py', 'task04.py', 'task05.py', 'task02.py', 'Labtests', 'AI\_Ass-71\_4048.pdf', 'AI\_LAB-01\_4048.pdf', 'AI\_LAB02\_4048.pdf', 'AI\_LAB03\_4048.pdf', 'AI\_LAB03\_4065.pdf', 'fibonacci\_no\_funcio...', 'HPC-7.5\_4048.pdf', 'Lab\_Assignment\_5.1...', 'practice.py', and 'user\_info.txt'. The code editor shows the content of 'task01.py' with the following code:

```
lab8.1 > task01.py > ...
1 # Generate at least 5 assert-based test cases for a function:
2 # def is_strong_password(password):
3 # Requirements:
4 # - At least 8 characters
5 # - Must contain uppercase letter
6 # - Must contain lowercase letter
7 # - Must contain digit
8 # - Must contain special character
9 # - Must not contain spaces
10 # Include edge cases such as:
11 # - Empty string
12 # - Only digits
13 # - Only uppercase
14 # - Password with spaces
15 # - Exactly 8 characters valid case
16 # Return only assert statements.
17 # Now implement the Python function:
18 # def is_strong_password(password):
19 # Make sure it passes all previously generated test cases.
20 # Use clean logic and proper condition checking.
21 # Do not use external libraries.
22 def is_strong_password(password):
23     if not isinstance(password, str):
24         return False
25
26     if len(password) < 8:
27         return False
28
29     if ' ' in password:
30         return False
31
32     if not any(char.isupper() for char in password):
33         return False
34
35     if not any(char.islower() for char in password):
36         return False
37
38     if not any(char.isdigit() for char in password):
39         return False
40
41     if not any(char in "!@#$%^&*()-_+=[]{}|;:'.<>?'" for char in password):
42         return False
43
```



```
lab8.1 > task01.py > ...
47 # Test Cases
48 assert is_strong_password("Password123!") == True
49 assert is_strong_password("") == False
50 assert is_strong_password("12345678") == False
51 assert is_strong_password("PASSWORD") == False
52 assert is_strong_password("Pass word!") == False
53 assert is_strong_password("Passw1!") == False
54 assert is_strong_password("Passw0rd!") == True
55 assert is_strong_password("P@ssw0rd") == True
56 assert is_strong_password("P@ss w0rd") == False
57 assert is_strong_password("P@ssw0") == False
58
59 print("All test cases passed successfully 🟢")
60
61 # Analyze the password validation function.
62 # Suggest improvements for:
63 # - Readability
64 # - Security
65 # - Edge case handling
66 # - Performance
67
68 # Explain briefly.
69 # The function is_strong_password is straightforward and checks all the required conditions for a strong password.
70 # Improvements:
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

Python + Python 3.9.6

Ln 18, Col 36 Spaces: 4 UTF-8 LF Python 3.9.6

**Explanation:** This checks if a password is truly “strong” by making sure it has the right mix of characters and no spaces.

## 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:

- o Classify numbers as Positive, Negative, or Zero.
- o Handle invalid inputs like strings and None.
- o 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.

### Output Screenshot:

The screenshot shows a VS Code editor with a Python file named `task02.py` open. The code defines a `classify_number` function and includes test cases. The file explorer on the left shows a project named `AI_ASSISTED_LAB` with various files and folders. The status bar at the bottom indicates the file is at line 14, column 26, with 4 spaces, UTF-8 encoding, LF line endings, and Python 3.9.6 interpreter.

```
lab8.1 > task02.py > ...
1 # Generate at least 5 assert-based test cases for:
2 # def classify_number(n):
3 # Requirements:
4 # - Return "Positive" if n > 0
5 # - Return "Negative" if n < 0
6 # - Return "Zero" if n == 0
7 # - Handle invalid inputs (string, None, float)
8 # Include boundary values:
9 # - -1
10 # - 0
11 # - 1
12 # Return only assert statements.
13 # Write the function:
14 # def classify_number(n):
15 # Requirements:
16 # - Use loop-based logic wherever applicable
17 # - Handle invalid inputs properly
18 # - Return correct classification
19 # - No external libraries
20 def classify_number(n):
21     if not isinstance(n, (int, float)):
22         return "Invalid input"
23
24     if n > 0:
25         return "Positive"
26     elif n < 0:
27         return "Negative"
28     else:
29         return "Zero"
30 # Test Cases
31 assert classify_number(10) == "Positive"
32 assert classify_number(-5) == "Negative"
33 assert classify_number(0) == "Zero"
34 assert classify_number("string") == "Invalid input"
35 assert classify_number(None) == "Invalid input"
36 assert classify_number(3.14) == "Positive"
37 assert classify_number(-2.71) == "Negative"
38 print("All test cases passed successfully 🎉")
39
40 # Analyze whether the generated test cases fully cover:
41 # - Boundary cases
42 # - Invalid inputs
43 # - Type checking
44 ...
```

The screenshot shows an IDE with a file explorer on the left, a code editor in the center, and a terminal at the bottom. The file explorer lists files like `lab01`, `lab1.3`, `lab2.1`, `lab3.1`, `lab4.1`, `lab5.1`, `lab6.3`, `lab7.1`, `lab7.5`, `lab8.1`, `task01.py`, `task02.py`, `task03.py`, `task04.py`, `task05.py`, `Labtests`, `AI_Ass-71_4048.pdf`, `AI_LAB-01_4048.pdf`, `AI_LAB02_4048.pdf`, `AI_LAB03_4048.pdf`, `AI_LAB03_4065.pdf`, `fibonacci_no_funcio...`, `HPC-75_4048.pdf`, `Lab_Assignment_5.1...`, `practice.py`, and `user_info.txt`. The code editor shows the content of `task02.py`, which includes comments for requirements and a function definition. The terminal shows the execution path and a successful result.

```
lab8.1 > task02.py > ...
1 # Generate at least 5 assert-based test cases for:
2 # def classify_number(n):
3 # Requirements:
4 # - Return "Positive" if n > 0
5 # - Return "Negative" if n < 0
6 # - Return "Zero" if n == 0
7 # - Handle invalid inputs (string, None, float)
8 # Include boundary values:
9 # - -1
10 # - 0
11 # - 1
12 # Return only assert statements.
13 # Write the function:
14 # def classify_number(n):
15 # Requirements:
16 # - Use loop-based logic wherever applicable
17 # - Handle invalid inputs properly
18 # - Return correct classification
19 # - No external libraries
20 def classify_number(n):
21     if not isinstance(n, (int, float)):
22         return "Invalid input"
23
24     if n > 0:
25         return "Positive"
26     elif n < 0:
27         return "Negative"
28     else:
29         return "Zero"
30
31 # Test cases
32 # 1. Positive
33 # 2. Negative
34 # 3. Zero
35 # 4. Invalid input (string)
36 # 5. Invalid input (float)
37 # 6. Boundary values (-1, 0, 1)
38 # 7. Large positive number
39 # 8. Large negative number
40 # 9. Small positive number
41 # 10. Small negative number
42 # 11. Zero
43 # 12. None
44 # 13. Empty string
45 # 14. List
46 # 15. Dictionary
47 # 16. Complex number
48 # 17. Boolean
49 # 18. Set
50 # 19. Tuple
51 # 20. Range
52 # 21. Bytes
53 # 22. bytearray
54 # 23. Memoryview
55 # 24. Iterator
56 # 25. Generator
57 # 26. Callable
58 # 27. Enum
59 # 28. Path
60 # 29. UUID
61 # 30. Decimal
62 # 31. Fraction
63 # 32. Complex
64 # 33. int
65 # 34. float
66 # 35. bool
67 # 36. str
68 # 37. bytes
69 # 38. bytearray
70 # 39. memoryview
71 # 40. iterator
72 # 41. generator
73 # 42. callable
74 # 43. enum
75 # 44. path
76 # 45. uuid
77 # 46. decimal
78 # 47. fraction
79 # 48. complex
80 # 49. int
81 # 50. float
82 # 51. bool
83 # 52. str
84 # 53. bytes
85 # 54. bytearray
86 # 55. memoryview
87 # 56. iterator
88 # 57. generator
89 # 58. callable
90 # 59. enum
91 # 60. path
92 # 61. uuid
93 # 62. decimal
94 # 63. fraction
95 # 64. complex
96 # 65. int
97 # 66. float
98 # 67. bool
99 # 68. str
100 # 69. bytes
101 # 70. bytearray
102 # 71. memoryview
103 # 72. iterator
104 # 73. generator
105 # 74. callable
106 # 75. enum
107 # 76. path
108 # 77. uuid
109 # 78. decimal
110 # 79. fraction
111 # 80. complex
112 # 81. int
113 # 82. float
114 # 83. bool
115 # 84. str
116 # 85. bytes
117 # 86. bytearray
118 # 87. memoryview
119 # 88. iterator
120 # 89. generator
121 # 90. callable
122 # 91. enum
123 # 92. path
124 # 93. uuid
125 # 94. decimal
126 # 95. fraction
127 # 96. complex
128 # 97. int
129 # 98. float
130 # 99. bool
131 # 100. str
132 # 101. bytes
133 # 102. bytearray
134 # 103. memoryview
135 # 104. iterator
136 # 105. generator
137 # 106. callable
138 # 107. enum
139 # 108. path
140 # 109. uuid
141 # 110. decimal
142 # 111. fraction
143 # 112. complex
144 # 113. int
145 # 114. float
146 # 115. bool
147 # 116. str
148 # 117. bytes
149 # 118. bytearray
150 # 119. memoryview
151 # 120. iterator
152 # 121. generator
153 # 122. callable
154 # 123. enum
155 # 124. path
156 # 125. uuid
157 # 126. decimal
158 # 127. fraction
159 # 128. complex
160 # 129. int
161 # 130. float
162 # 131. bool
163 # 132. str
164 # 133. bytes
165 # 134. bytearray
166 # 135. memoryview
167 # 136. iterator
168 # 137. generator
169 # 138. callable
170 # 139. enum
171 # 140. path
172 # 141. uuid
173 # 142. decimal
174 # 143. fraction
175 # 144. complex
176 # 145. int
177 # 146. float
178 # 147. bool
179 # 148. str
180 # 149. bytes
181 # 150. bytearray
182 # 151. memoryview
183 # 152. iterator
184 # 153. generator
185 # 154. callable
186 # 155. enum
187 # 156. path
188 # 157. uuid
189 # 158. decimal
190 # 159. fraction
191 # 160. complex
192 # 161. int
193 # 162. float
194 # 163. bool
195 # 164. str
196 # 165. bytes
197 # 166. bytearray
198 # 167. memoryview
199 # 168. iterator
200 # 169. generator
201 # 170. callable
202 # 171. enum
203 # 172. path
204 # 173. uuid
205 # 174. decimal
206 # 175. fraction
207 # 176. complex
208 # 177. int
209 # 178. float
210 # 179. bool
211 # 180. str
212 # 181. bytes
213 # 182. bytearray
214 # 183. memoryview
215 # 184. iterator
216 # 185. generator
217 # 186. callable
218 # 187. enum
219 # 188. path
220 # 189. uuid
221 # 190. decimal
222 # 191. fraction
223 # 192. complex
224 # 193. int
225 # 194. float
226 # 195. bool
227 # 196. str
228 # 197. bytes
229 # 198. bytearray
230 # 199. memoryview
231 # 200. iterator
232 # 201. generator
233 # 202. callable
234 # 203. enum
235 # 204. path
236 # 205. uuid
237 # 206. decimal
238 # 207. fraction
239 # 208. complex
240 # 209. int
241 # 210. float
242 # 211. bool
243 # 212. str
244 # 213. bytes
245 # 214. bytearray
246 # 215. memoryview
247 # 216. iterator
248 # 217. generator
249 # 218. callable
250 # 219. enum
251 # 220. path
252 # 221. uuid
253 # 222. decimal
254 # 223. fraction
255 # 224. complex
256 # 225. int
257 # 226. float
258 # 227. bool
259 # 228. str
260 # 229. bytes
261 # 230. bytearray
262 # 231. memoryview
263 # 232. iterator
264 # 233. generator
265 # 234. callable
266 # 235. enum
267 # 236. path
268 # 237. uuid
269 # 238. decimal
270 # 239. fraction
271 # 240. complex
272 # 241. int
273 # 242. float
274 # 243. bool
275 # 244. str
276 # 245. bytes
277 # 246. bytearray
278 # 247. memoryview
279 # 248. iterator
280 # 249. generator
281 # 250. callable
282 # 251. enum
283 # 252. path
284 # 253. uuid
285 # 254. decimal
286 # 255. fraction
287 # 256. complex
288 # 257. int
289 # 258. float
290 # 259. bool
291 # 260. str
292 # 261. bytes
293 # 262. bytearray
294 # 263. memoryview
295 # 264. iterator
296 # 265. generator
297 # 266. callable
298 # 267. enum
299 # 268. path
300 # 269. uuid
301 # 270. decimal
302 # 271. fraction
303 # 272. complex
304 # 273. int
305 # 274. float
306 # 275. bool
307 # 276. str
308 # 277. bytes
309 # 278. bytearray
310 # 279. memoryview
311 # 280. iterator
312 # 281. generator
313 # 282. callable
314 # 283. enum
315 # 284. path
316 # 285. uuid
317 # 286. decimal
318 # 287. fraction
319 # 288. complex
320 # 289. int
321 # 290. float
322 # 291. bool
323 # 292. str
324 # 293. bytes
325 # 294. bytearray
326 # 295. memoryview
327 # 296. iterator
328 # 297. generator
329 # 298. callable
330 # 299. enum
331 # 300. path
332 # 301. uuid
333 # 302. decimal
334 # 303. fraction
335 # 304. complex
336 # 305. int
337 # 306. float
338 # 307. bool
339 # 308. str
340 # 309. bytes
341 # 310. bytearray
342 # 311. memoryview
343 # 312. iterator
344 # 313. generator
345 # 314. callable
346 # 315. enum
347 # 316. path
348 # 317. uuid
349 # 318. decimal
350 # 319. fraction
351 # 3
```

**Explanation:** This sorts numbers into positive, negative, or zero, while politely rejecting anything that isn't a number.

### 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:**

- o Ignore case, spaces, and punctuation.
- o 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.

### Output Screenshot:

```
lab8.1 > task03.py > ...
1 # Generate at least 6 assert-based test cases for:
2 # def is_anagram(str1, str2):
3 # Requirements:
4 # - Ignore case
5 # - Ignore spaces
6 # - Ignore punctuation
7 # - Handle empty strings
8 # - Handle identical words
9 # Include both positive and negative cases.
10 # Return only assert statements.
11 # Write a clean Python implementation for:
12 # def is_anagram(str1, str2):
13 # Requirements:
14 # - Ignore case differences
15 # - Remove spaces
16 # - Remove punctuation
17 # - Handle empty input safely
18 # - No external libraries
19 # Ensure all test cases pass.
20 def is_anagram(str1, str2):
21     def clean_string(s):
22         return ''.join(char.lower() for char in s if char.isalnum())
23
24     cleaned_str1 = clean_string(str1)
25     cleaned_str2 = clean_string(str2)
26
27     return sorted(cleaned_str1) == sorted(cleaned_str2)
28 # Test Cases
29 assert is_anagram("Listen", "Silent") == True
30 assert is_anagram("Triangle", "Integral") == True
31 assert is_anagram("Dormitory", "Dirty Room") == True
32 assert is_anagram("Hello", "World") == False
33 assert is_anagram("", "") == True
34 assert is_anagram("A", "a") == True
35 assert is_anagram("Anagram", "Nag a ram") == True
36 assert is_anagram("Test", "Best") == False
37 print("All test cases passed successfully 🎉")
38
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS Python + - [ ] ... [ ] X

```
/usr/bin/python3 /Users/anumandlarithika/SRU/Ai_Assisted_lab/lab8.1/task03.py
anumandlarithika@ANUMANDLAS-MacBook-Air Ai_Assisted_lab % /usr/bin/python3 /Users/anumandlarithika/SRU/Ai_Assisted_lab/lab8.1/task03.py
All test cases passed successfully 🎉
anumandlarithika@ANUMANDLAS-MacBook-Air Ai_Assisted_lab %
```

**Explanation:** This spots whether two words or phrases are made of the same letters, ignoring case, spaces, and punctuation.

## 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:**
  - o add\_item(name, quantity)
  - o remove\_item(name, quantity)
  - o get\_stock(name)

### Example Assert Test Cases:

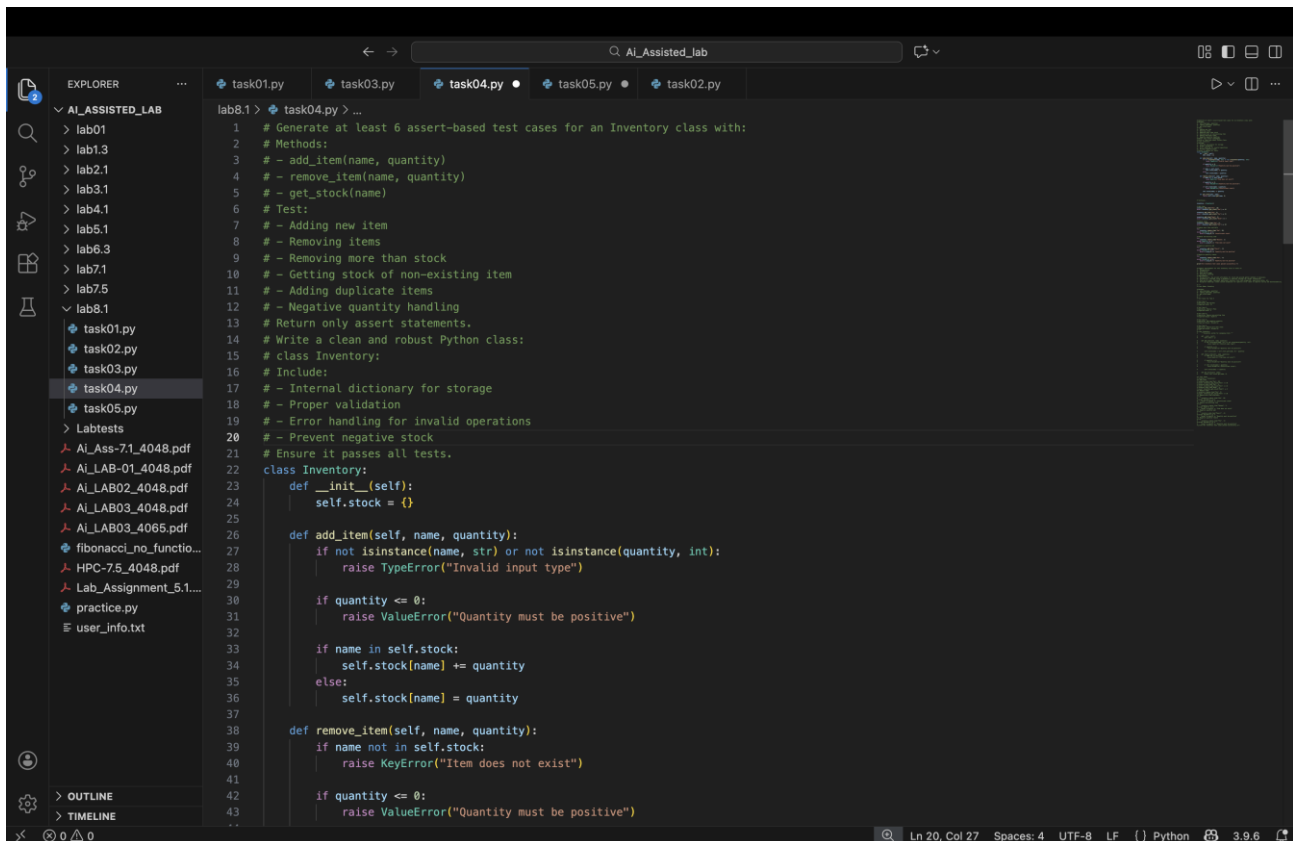
```
inv = Inventory()

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

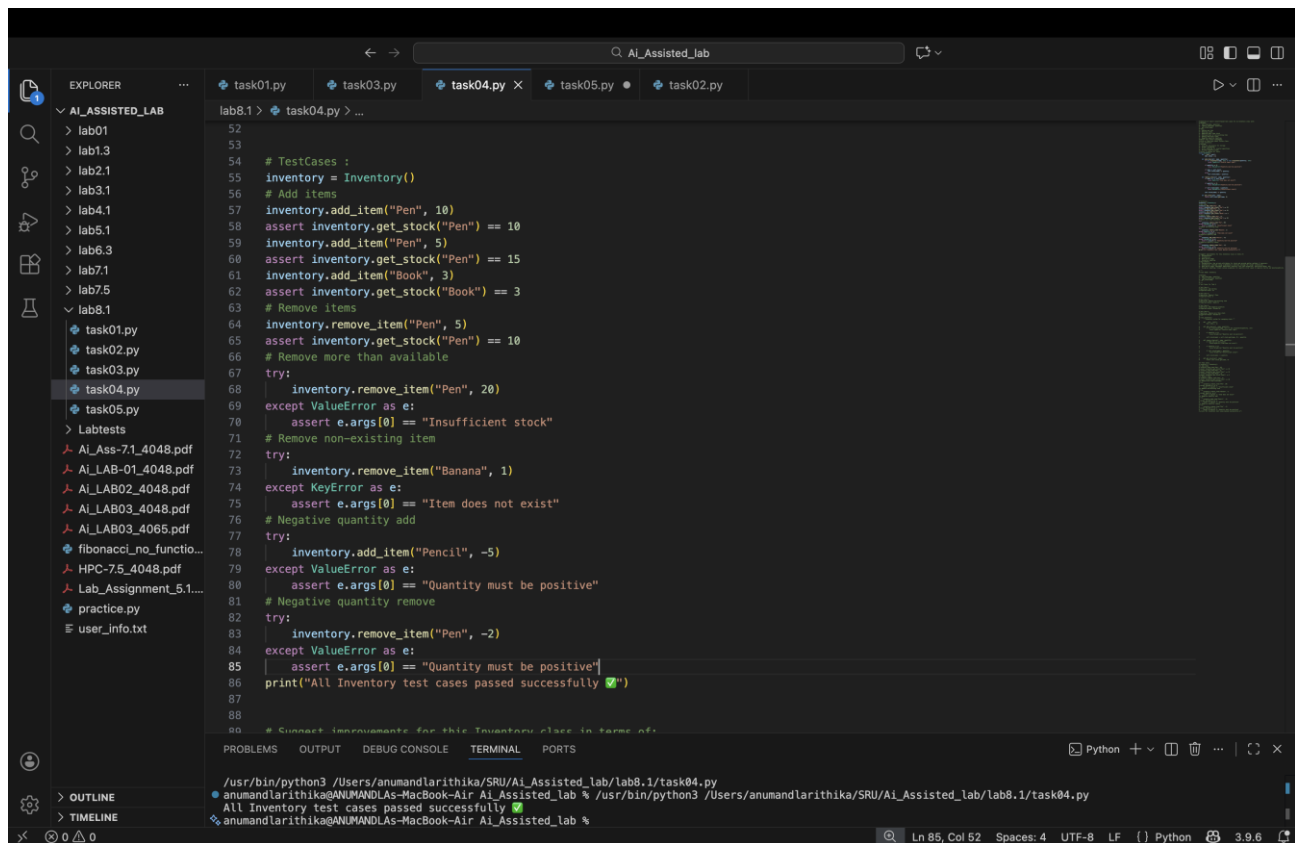
```
inv.remove_item("Pen", 5)
assert inv.get_stock("Pen") == 5
inv.add_item("Book", 3)
assert inv.get_stock("Book") == 3
```

**Expected Output #4: • Fully functional class passing all assertions.**

**Output Screenshot:**



```
lab8.1 > task04.py > ...
1 # Generate at least 6 assert-based test cases for an Inventory class with:
2 # Methods:
3 # - add_item(name, quantity)
4 # - remove_item(name, quantity)
5 # - get_stock(name)
6 # Test:
7 # - Adding new item
8 # - Removing items
9 # - Removing more than stock
10 # - Getting stock of non-existing item
11 # - Adding duplicate items
12 # - Negative quantity handling
13 # Return only assert statements.
14 # Write a clean and robust Python class:
15 # class Inventory:
16 # Include:
17 # - Internal dictionary for storage
18 # - Proper validation
19 # - Error handling for invalid operations
20 # - Prevent negative stock
21 # Ensure it passes all tests.
22 class Inventory:
23     def __init__(self):
24         self.stock = {}
25
26     def add_item(self, name, quantity):
27         if not isinstance(name, str) or not isinstance(quantity, int):
28             raise TypeError("Invalid input type")
29
30         if quantity <= 0:
31             raise ValueError("Quantity must be positive")
32
33         if name in self.stock:
34             self.stock[name] += quantity
35         else:
36             self.stock[name] = quantity
37
38     def remove_item(self, name, quantity):
39         if name not in self.stock:
40             raise KeyError("Item does not exist")
41
42         if quantity <= 0:
43             raise ValueError("Quantity must be positive")
44
```



```
52
53
54 # TestCases :
55 inventory = Inventory()
56 # Add items
57 inventory.add_item("Pen", 10)
58 assert inventory.get_stock("Pen") == 10
59 inventory.add_item("Pen", 5)
60 assert inventory.get_stock("Pen") == 15
61 inventory.add_item("Book", 3)
62 assert inventory.get_stock("Book") == 3
63 # Remove items
64 inventory.remove_item("Pen", 5)
65 assert inventory.get_stock("Pen") == 10
66 # Remove more than available
67 try:
68     inventory.remove_item("Pen", 20)
69 except ValueError as e:
70     assert e.args[0] == "Insufficient stock"
71 # Remove non-existing item
72 try:
73     inventory.remove_item("Banana", 1)
74 except KeyError as e:
75     assert e.args[0] == "Item does not exist"
76 # Negative quantity add
77 try:
78     inventory.add_item("Pencil", -5)
79 except ValueError as e:
80     assert e.args[0] == "Quantity must be positive"
81 # Negative quantity remove
82 try:
83     inventory.remove_item("Pen", -2)
84 except ValueError as e:
85     assert e.args[0] == "Quantity must be positive"
86 print("All Inventory test cases passed successfully 🎉")
87
88
89 # Suggest improvements for this function place in some of:
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

/usr/bin/python3 /Users/anumandlarithika/SRU/AI\_Assisted\_lab/lab8.1/task04.py  
anumandlarithika@ANUMANDLAS-MacBook-Air AI\_Assisted\_lab % /usr/bin/python3 /Users/anumandlarithika/SRU/AI\_Assisted\_lab/lab8.1/task04.py  
All Inventory test cases passed successfully 🎉  
anumandlarithika@ANUMANDLAS-MacBook-Air AI\_Assisted\_lab %

**Explanation:** This simulates a mini store system where you can add, remove, and check stock for items.

## Task Description #5 (Date Validation & Formatting – Apply AI for Data Validation)

• **Task:** Use AI to generate at least 3 assert test cases for `validate_and_format_date(date_str)` to check and convert dates.

• **Requirements:**

- o Validate "MM/DD/YYYY" format.
- o Handle invalid dates.
- o Convert valid dates to "YYYY-MM-DD".

**Example Assert Test Cases:**

```
assert validate_and_format_date("10/15/2023") == "2023-10-15"
assert validate_and_format_date("02/30/2023") == "Invalid Date"
assert validate_and_format_date("01/01/2024") == "2024-01-01"
```

**Expected Output #5:** • Function passes all AI-generated assertions and handles edge cases.

## Output Screenshot:

The image consists of two screenshots of a Visual Studio Code editor window, showing the development and testing of a Python function for date validation.

**Top Screenshot:** The editor is open to `task05.py` in the `lab8.1` directory. The code defines a function `validate_and_format_date(date_str)` that takes a date string in "MM/DD/YYYY" format and returns it in "YYYY-MM-DD" format. The function includes comments for requirements and a list of test cases. The code is as follows:

```
lab8.1 > task05.py > ...
1 # Generate at least 6 assert test cases for:
2 # def validate_and_format_date(date_str):
3 # Requirements:
4 # - Input format must be MM/DD/YYYY
5 # - Validate correct calendar date
6 # - Handle leap year
7 # - Reject invalid format
8 # - Return "Invalid Date" for invalid inputs
9 # - Convert valid date to YYYY-MM-DD
10 # Include boundary cases:
11 # - 02/29/2024 (leap year)
12 # - 02/29/2023 (invalid)
13 # - 13/01/2023 (invalid month)
14 # - 00/10/2023
15 # Return only assert statements.
16 # Write the function:
17 # def validate_and_format_date(date_str):
18 # Requirements:
19 # - Validate format manually (no external libraries)
20 # - Check month range
21 # - Check correct number of days
22 # - Handle leap years properly
23 # - Return formatted date if valid
24 # - Else return "Invalid Date"
25 # Keep the code clean and readable.
26 def validate_and_format_date(date_str):
27     def is_leap_year(year):
28         return (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0)
29
30     try:
31         month, day, year = map(int, date_str.split('/'))
32     except ValueError:
33         return "Invalid Date"
34
35     if month < 1 or month > 12:
36         return "Invalid Date"
37
38     if day < 1:
39         return "Invalid Date"
40
41     if month in [1, 3, 5, 7, 8, 10, 12]:
42         if day > 31:
43             return "Invalid Date"
44         ...
```

**Bottom Screenshot:** The editor is open to `task05.py` in the `lab8.1` directory. The code continues from the previous screenshot, showing the implementation of the `validate_and_format_date` function and its test cases. The code is as follows:

```
26 def validate_and_format_date(date_str):
44     elif month in [4, 6, 9, 11]:
45         if day > 30:
46             return "Invalid Date"
47     elif month == 2:
48         if is_leap_year(year):
49             if day > 29:
50                 return "Invalid Date"
51         else:
52             if day > 28:
53                 return "Invalid Date"
54     return f"{year:04d}-{month:02d}-{day:02d}"
55
56 # Test Cases
57 assert validate_and_format_date("02/29/2024") == "2024-02-29"
58 assert validate_and_format_date("02/29/2023") == "Invalid Date"
59 assert validate_and_format_date("13/01/2023") == "Invalid Date"
60 assert validate_and_format_date("00/10/2023") == "Invalid Date"
61 assert validate_and_format_date("12/31/2023") == "2023-12-31"
62 assert validate_and_format_date("01/01/2023") == "2023-01-01"
63 assert validate_and_format_date("02/30/2024") == "Invalid Date"
64 assert validate_and_format_date("invalid") == "Invalid Date"
65 print("All test cases passed successfully 🎉")
66
```

The bottom screenshot also shows the `PROBLEMS` panel, which displays the output of the test cases, confirming that all test cases passed successfully.

**Explanation:** This ensures a date is valid in “MM/DD/YYYY” format and neatly converts it into “YYYY-MM-DD”.