Assignment-8.3

Task1:

code for the function is_valid_email(email) to check valid and invalid email formats, then implement the function so that it contains exactly one @, includes ., does not start or end with special characters, and passes all test cases.user input and check correct or not

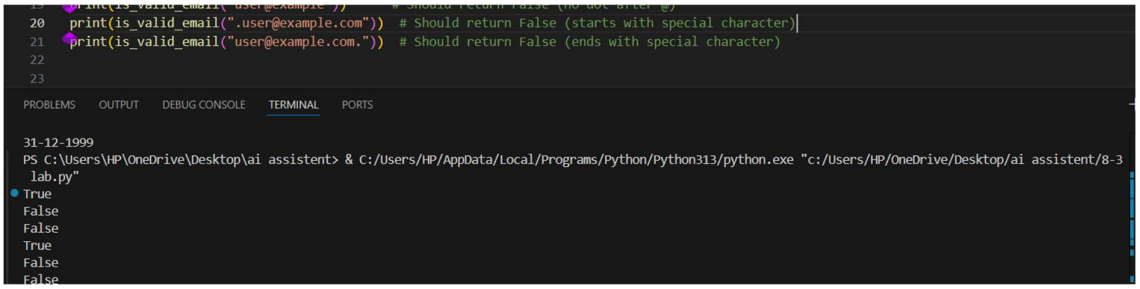
Code:

```
import re

def is_valid_email(email):
    # Check if email contains exactly one @
    if email.count('@') != 1 or email.count('@')>1:
        return False
    # Check if email starts or ends with special characters
    if re.match(r'^[^a-zA-Z0-9]+|[^a-zA-Z0-9]+$', email):
        return False
    if "." == email[0] or "." == email[-1]:
        return False


    return True
# Test cases
print(is_valid_email("test@example.com"))  # Should return True
print(is_valid_email("invalid.email"))     # Should return False (no @)
print(is_valid_email("user@@example.com"))  # Should return False (multiple @)
print(is_valid_email("user@example"))      # Should return False (no dot after @)
print(is_valid_email(".user@example.com"))  # Should return False (starts with special character)
print(is_valid_email("user@example.com."))  # Should return False (ends with special character)
```

Output:



Analysis:

The function checks the user-entered email by ensuring it contains exactly one @, includes a dot, and does not start or end with special characters. Invalid email formats are rejected, and valid emails return True.

Task 2:

code for assign_grade(score) covering all grade ranges, boundary values, and invalid inputs, then implement the function using conditions so that all test cases pass and invalid inputs are handled properly.

Code:

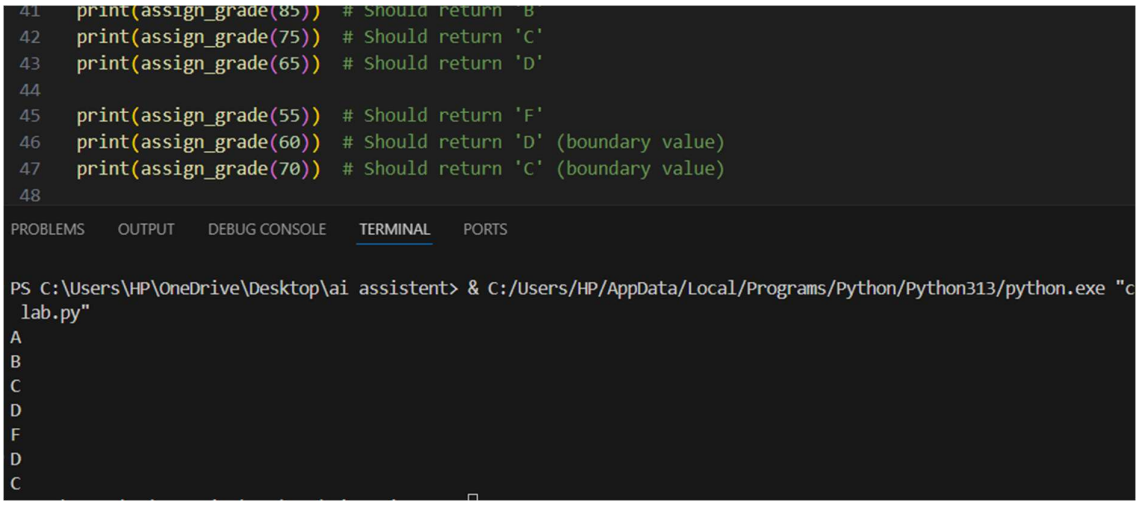
```
import unittest

def assign_grade(score):
    if isinstance(score, (int, float)):
        if 90 <= score <= 100:
            return 'A'
        elif 80 <= score < 90:
            return 'B'
        elif 70 <= score < 80:
            return 'C'
        elif 60 <= score < 70:
            return 'D'
        elif score < 60:
            return 'F'
    return "Invalid input"
```

```
# user input and test cases
print(assign_grade(95))  # Should return 'A'
print(assign_grade(85))  # Should return 'B'
print(assign_grade(75))  # Should return 'C'
print(assign_grade(65))  # Should return 'D'

print(assign_grade(55))  # Should return 'F'
print(assign_grade(60))  # Should return 'D' (boundary value)
print(assign_grade(70))  # Should return 'C' (boundary value)
```

Output:



Analysis:

The function assigns grades based on the user's score using conditional statements. Boundary values are handled correctly, and invalid inputs return an error message without crashing.

Task 3:

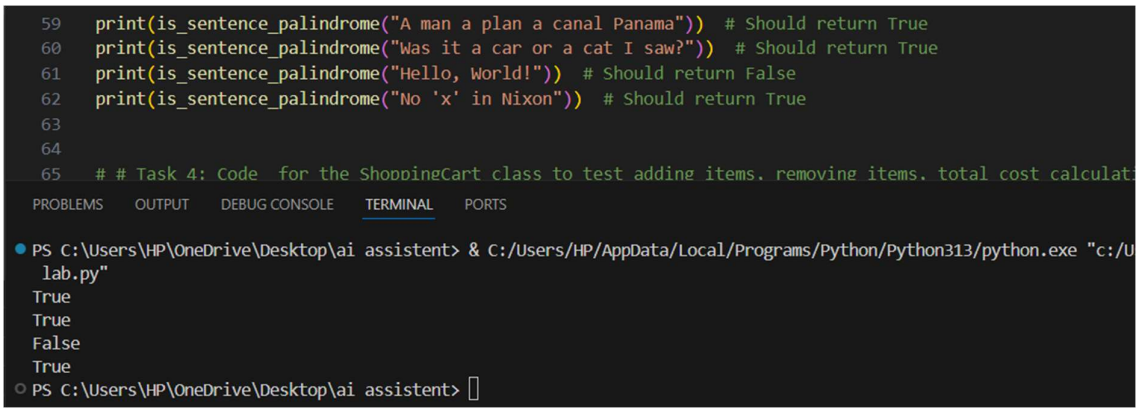
Code for is_sentence_palindrome(sentence) by ignoring case, spaces, and punctuation, then implement the function to correctly identify palindromic and non-palindromic sentences.

Code:

```
import unittest
import re
```

```
def is_sentence_palindrome(sentence):
    # Remove non-alphanumeric characters and convert to lowercase
    cleaned_sentence = re.sub(r'[^A-Za-z0-9]', '', sentence).lower()
    # Check if the cleaned sentence is equal to its reverse
    return cleaned_sentence == cleaned_sentence[::-1]
# Test cases
print(is_sentence_palindrome("A man a plan a canal Panama"))  # Should return True
print(is_sentence_palindrome("Was it a car or a cat I saw?"))  # Should return True
print(is_sentence_palindrome("Hello, World!"))  # Should return False
print(is_sentence_palindrome("No 'x' in Nixon"))  # Should return True
```

Output:



Analysis:

The function removes spaces, punctuation, and ignores case before checking if the sentence is equal to its reverse. It correctly identifies palindromic and non-palindromic sentences.

Task 4:

Code for the ShoppingCart class to test adding items, removing items, total cost calculation, and empty cart cases, then implement the class so that all test cases pass successfully.

Code:

```
import unittest
class ShoppingCart:
    def __init__(self):
```

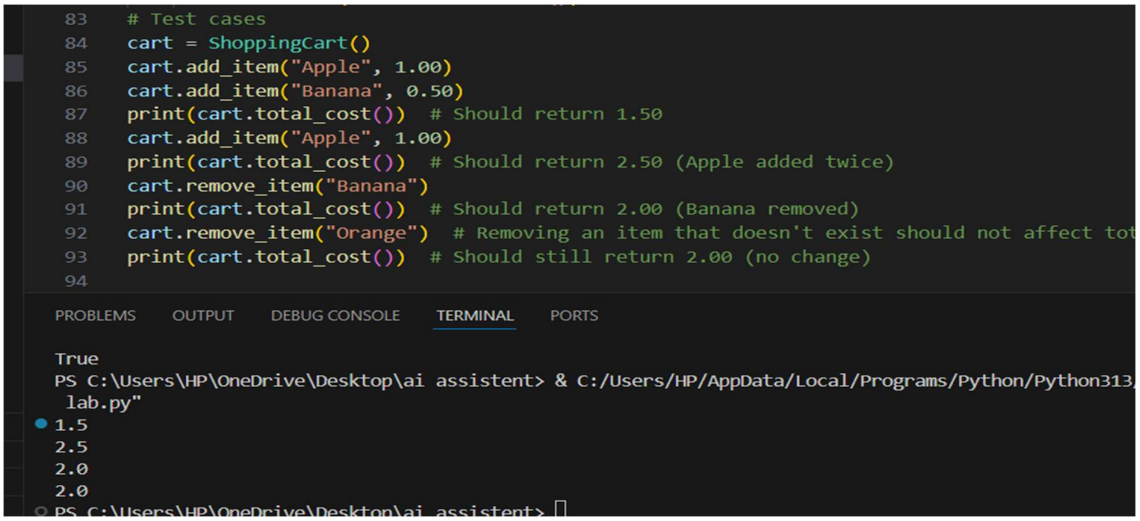
```
        self.items = {}

    def add_item(self, name, price):
        if name in self.items:
            self.items[name] += price
        else:
            self.items[name] = price

    def remove_item(self, name):
        if name in self.items:
            del self.items[name]

    def total_cost(self):
        return sum(self.items.values())
# Test cases
cart = ShoppingCart()
cart.add_item("Apple", 1.00)
cart.add_item("Banana", 0.50)
print(cart.total_cost())  # Should return 1.50
cart.add_item("Apple", 1.00)
print(cart.total_cost())  # Should return 2.50 (Apple added twice)
cart.remove_item("Banana")
print(cart.total_cost())  # Should return 2.00 (Banana removed)
cart.remove_item("Orange")  # Removing an item that doesn't exist should not affect total cost
print(cart.total_cost())  # Should still return 2.00 (no change)
```

Output:



Analysis:

The ShoppingCart class allows adding and removing items and calculates the total cost accurately. It safely handles empty cart and invalid removal cases.

Task 5:

code for the function convert_date_format(date_str) to convert date from "YYYY-MM-DD" to "DD-MM-YYYY" format, then implement the function to handle valid and invalid date formats correctly.

Code:

```
import unittest

def convert_date_format(date_str):
    try:
        year, month, day = date_str.split('-')
        if len(year) == 4 and len(month) == 2 and len(day) == 2:
            return f"{day}-{month}-{year}"
        else:
            return "Invalid date format"
    except ValueError:
        return "Invalid date format"

# Test cases
```

print(convert_date_format("2023-10-15")) # Should return "15-10-2023"

print(convert_date_format("2023/10/15")) # Should return "Invalid date format" (wrong separator)

print(convert_date_format("15-10-2023")) # Should return "Invalid date format" (wrong order)

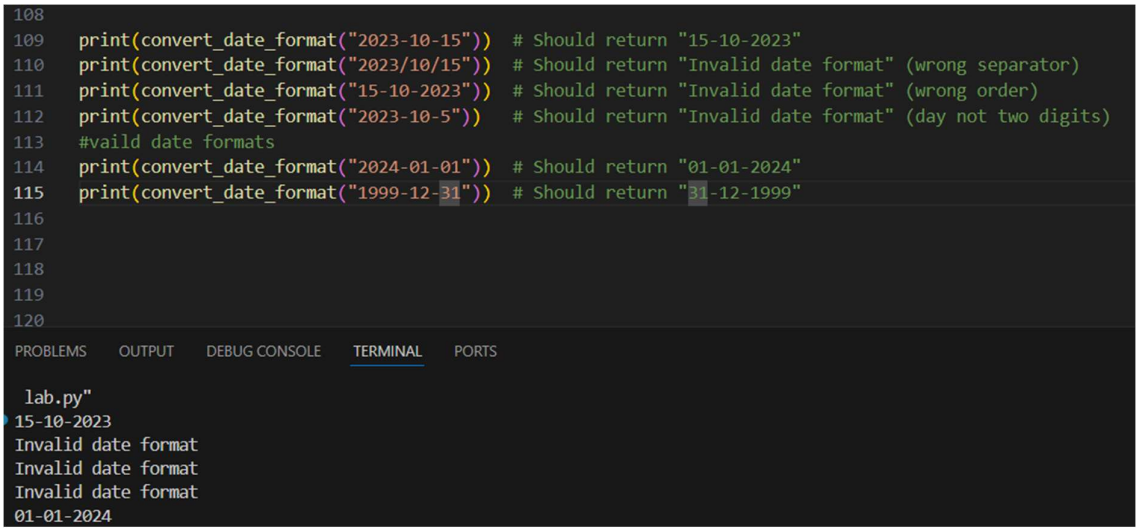
print(convert_date_format("2023-10-5"))   # Should return "Invalid date format" (day not two digits)

#vaild date formats

print(convert_date_format("2024-01-01")) # Should return "01-01-2024"

print(convert_date_format("1999-12-31")) # Should return "31-12-1999"

Output:



Analysis:

The function converts dates from YYYY-MM-DD to DD-MM-YYYY format and returns an error message for invalid inputs. Exception handling ensures reliable execution.