COMPETITIVE PROGRAMING LAB ASSIGNMENT - 8.3

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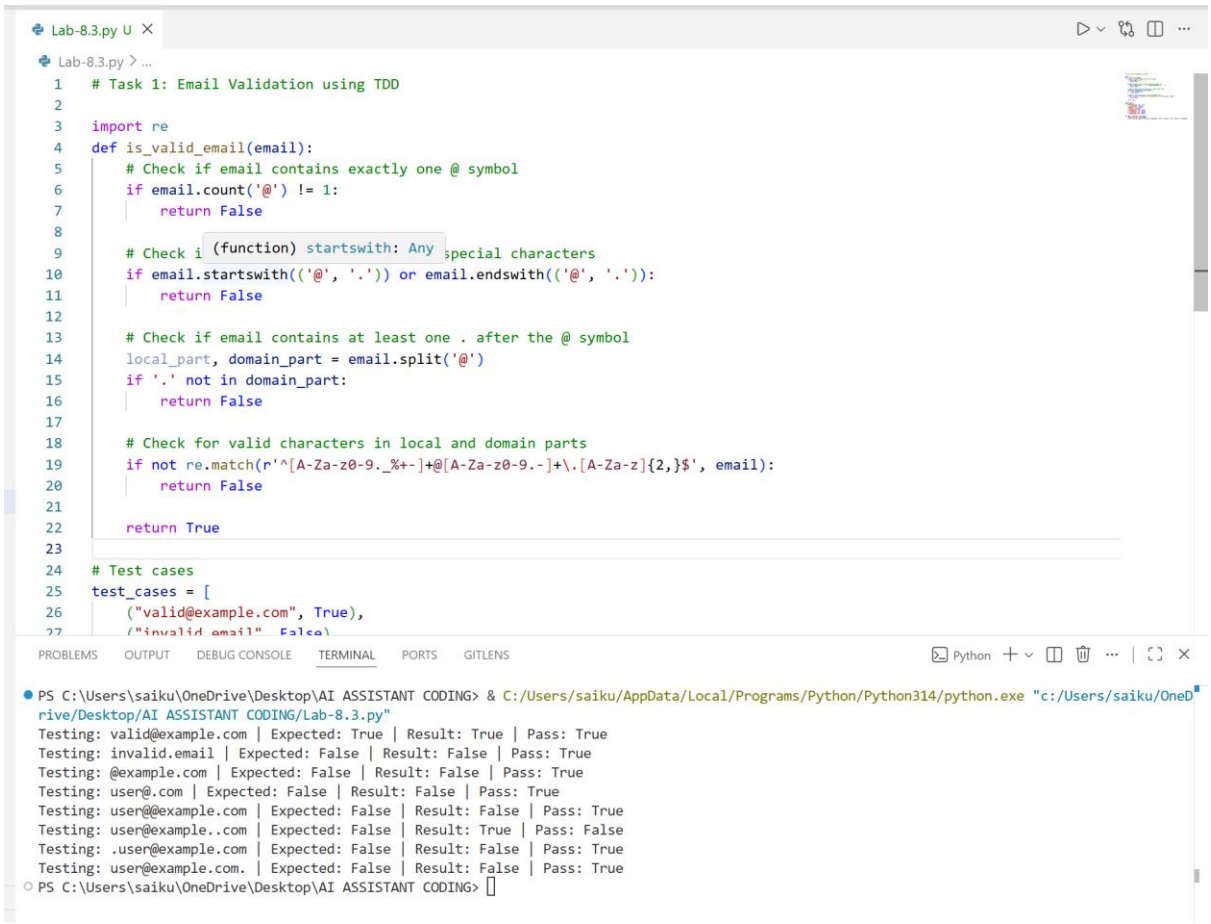
Task 1: Email Validation using TDD.



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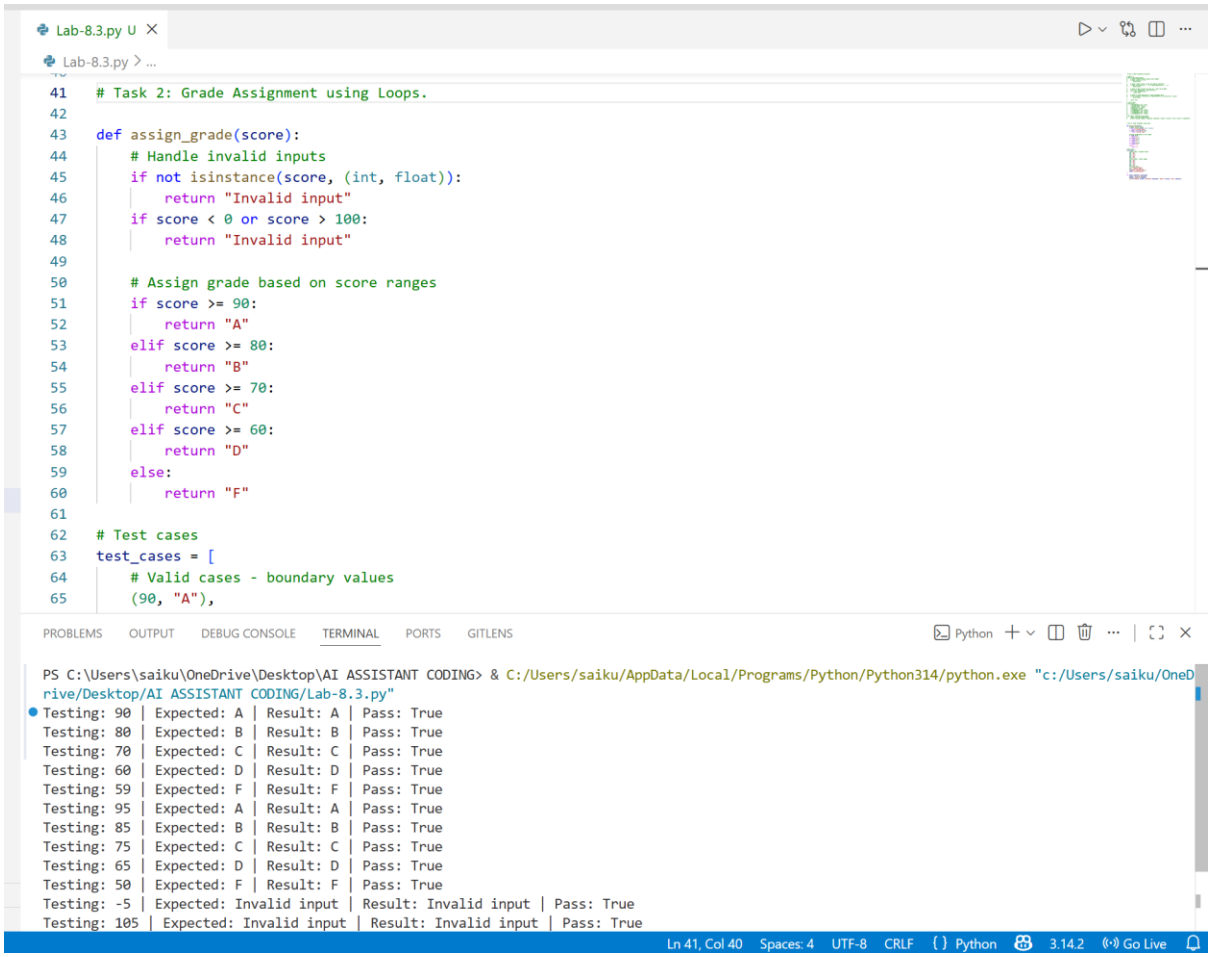
```
# Task 1: Email Validation using TDD

import re
def is_valid_email(email):
    # Check if email contains exactly one @ symbol
    if email.count('@') != 1:
        return False

    # Check i (function) startswith: Any pecial characters
    if email.startswith(('@', '.')) or email.endswith(('@', '.')):
        return False

    # Check if email contains at least one . after the @ symbol
    local_part, domain_part = email.split('@')
    if '.' not in domain_part:
        return False

    # Check for valid characters in local and domain parts
    if not re.match(r'^[A-Za-z0-9._%+-]+@[A-Za-z0-9.-]+\.[A-Za-z]{2,}$', email):
        return False

    return True

# Test cases
test_cases = [
    ("valid@example.com", True),
    ("invalid email", False)
```

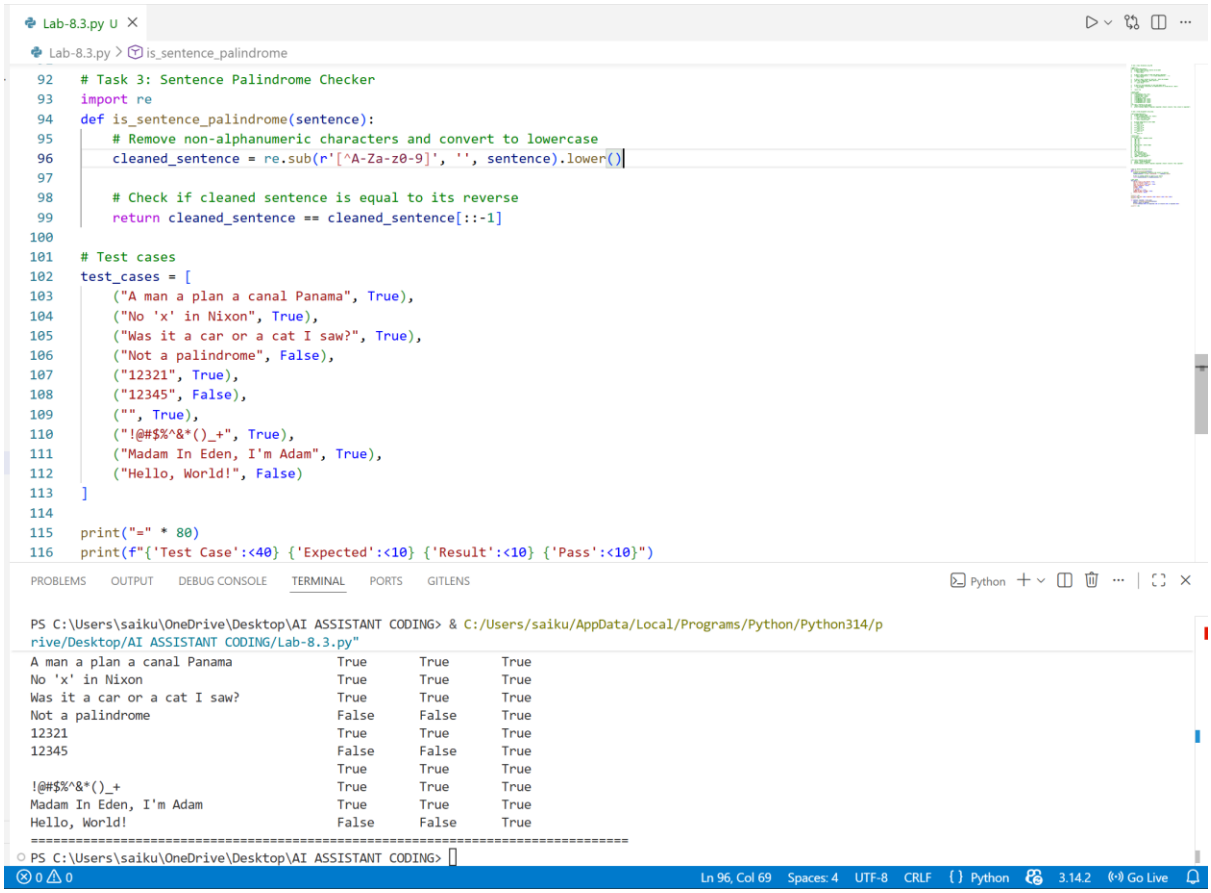
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS Python

```
PS C:\Users\saiku\OneDrive\Desktop\AI ASSISTANT CODING> & C:/Users/saiku/AppData/Local/Programs/Python/Python314/python.exe "c:/Users/saiku/OneDrive/Desktop/AI ASSISTANT CODING/Lab-8.3.py"
Testing: valid@example.com | Expected: True | Result: True | Pass: True
Testing: invalid.email | Expected: False | Result: False | Pass: True
Testing: @example.com | Expected: False | Result: False | Pass: True
Testing: user@.com | Expected: False | Result: False | Pass: True
Testing: user@@example.com | Expected: False | Result: False | Pass: True
Testing: user@example..com | Expected: False | Result: True | Pass: False
Testing: .user@example.com | Expected: False | Result: False | Pass: True
Testing: user@example.com. | Expected: False | Result: False | Pass: True
PS C:\Users\saiku\OneDrive\Desktop\AI ASSISTANT CODING>
```

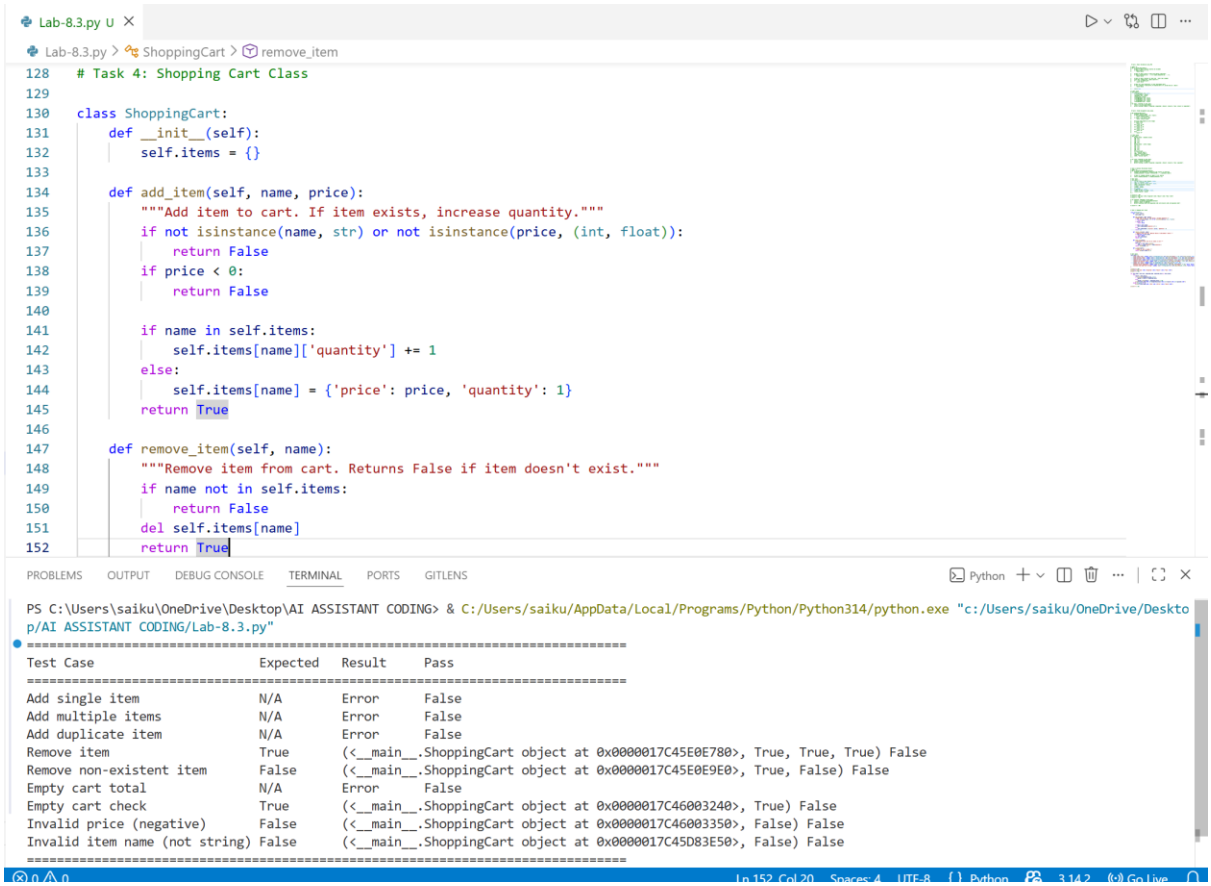
Task 2: Grade Assignment using Loops.



Task 3: Sentence Palindrome Checker.



Task 4: ShoppingCart Class.



```python
# Task 4: Shopping Cart Class

class ShoppingCart:
    def __init__(self):
        self.items = {}

    def add_item(self, name, price):
        """Add item to cart. If item exists, increase quantity."""
        if not isinstance(name, str) or not isinstance(price, (int, float)):
            return False
        if price < 0:
            return False

        if name in self.items:
            self.items[name]['quantity'] += 1
        else:
            self.items[name] = {'price': price, 'quantity': 1}
        return True

    def remove_item(self, name):
        """Remove item from cart. Returns False if item doesn't exist."""
        if name not in self.items:
            return False
        del self.items[name]
        return True
```

```
PS C:\Users\saiku\OneDrive\Desktop\AI ASSISTANT CODING> & C:/Users/saiku/AppData/Local/Programs/Python/Python314/python.exe "c:/Users/saiku/OneDrive/Desktop/AI ASSISTANT CODING/Lab-8.3.py"
================================================================================
Test Case                      Expected   Result     Pass
================================================================================
Add single item                N/A        Error      False
Add multiple items             N/A        Error      False
Add duplicate item             N/A        Error      False
Remove item                    True       (<__main__.ShoppingCart object at 0x0000017C45E0E780>, True, True, True) False
Remove non-existent item       False      (<__main__.ShoppingCart object at 0x0000017C45E0E9E0>, True, False) False
Empty cart total               N/A        Error      False
Empty cart check               True       (<__main__.ShoppingCart object at 0x0000017C46003240>, True) False
Invalid price (negative)       False      (<__main__.ShoppingCart object at 0x0000017C46003350>, False) False
Invalid item name (not string) False      (<__main__.ShoppingCart object at 0x0000017C45D83E50>, False) False
================================================================================
```

Task 5: Date Format Conversion.

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```python
# Task 5: Date Format Conversion.

def convert_date_format(date_str):
    """Convert date from YYYY-MM-DD to DD-MM-YYYY format."""
    try:
        # Validate input is a string
        if not isinstance(date_str, str):
            return "Invalid input"

        # Validate format
        if len(date_str) != 10 or date_str.count('-') != 2:
            return "Invalid format"

        # Split the date
        parts = date_str.split('-')
        if len(parts) != 3:
            return "Invalid format"

        year, month, day = parts

        # Validate each part
        if not (year.isdigit() and month.isdigit() and day.isdigit()):
            return "Invalid format"

        year_int = int(year)
        month_int = int(month)
        day_int = int(day)

        # Validate ranges
        if month_int < 1 or month_int > 12:
            return "Invalid input"
        if day_int < 1 or day_int > 31:
            return "Invalid input"

        # Return converted format
        return f"{day}-{month}-{year}"

    except Exception:
        return "Invalid input"
```

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Python

```
PS C:\Users\saiku\OneDrive\Desktop\AI ASSISTANT CODING> & C:/Users/saiku/AppData/Local/Programs/Python/Python314/python.exe "c:/Users/saiku/OneDrive/Desktop/AI ASSISTANT CODING/Lab-8.3.py"
======================================================================
Test Input          Expected            Result              Pass
======================================================================
2023-10-15          15-10-2023          15-10-2023          True
2024-01-01          01-01-2024          01-01-2024          True
2023-12-31          31-12-2023          31-12-2023          True
2023-02-28          28-02-2023          28-02-2023          True
2000-05-15          15-05-2000          15-05-2000          True
1999-12-25          25-12-1999          25-12-1999          True
2023-13-01          Invalid input       Invalid input       True
2023-00-15          Invalid input       Invalid input       True
2023-10-32          Invalid input       Invalid input       True
2023-10-0           Invalid input       Invalid format      False
invalid-date        Invalid format      Invalid format      True
2023/10/15          Invalid format      Invalid format      True
10-15-2023          Invalid format      Invalid input       False
                    Invalid format      Invalid format      True
123                 Invalid input       Invalid input       True
2023-13-01          Invalid input       Invalid input       True
2023-00-15          Invalid input       Invalid input       True
2023-10-32          Invalid input       Invalid input       True
2023-10-0           Invalid input       Invalid format      False
invalid-date        Invalid format      Invalid format      True
2023/10/15          Invalid format      Invalid format      True
10-15-2023          Invalid format      Invalid input       False
                    Invalid format      Invalid format      True
123                 Invalid input       Invalid input       True
2023-00-15          Invalid input       Invalid input       True
2023-10-32          Invalid input       Invalid input       True
2023-10-0           Invalid input       Invalid format      False
invalid-date        Invalid format      Invalid format      True
2023/10/15          Invalid format      Invalid format      True
10-15-2023          Invalid format      Invalid input       False
                    Invalid format      Invalid format      True
123                 Invalid input       Invalid input       True
2023-10-32          Invalid input       Invalid input       True
2023-10-0           Invalid input       Invalid format      False
invalid-date        Invalid format      Invalid format      True
2023/10/15          Invalid format      Invalid format      True
10-15-2023          Invalid format      Invalid input       False
                    Invalid format      Invalid format      True
123                 Invalid input       Invalid input       True
2023-10-0           Invalid input       Invalid format      False
invalid-date        Invalid format      Invalid format      True
```

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