AI Assisted Coding-7.3

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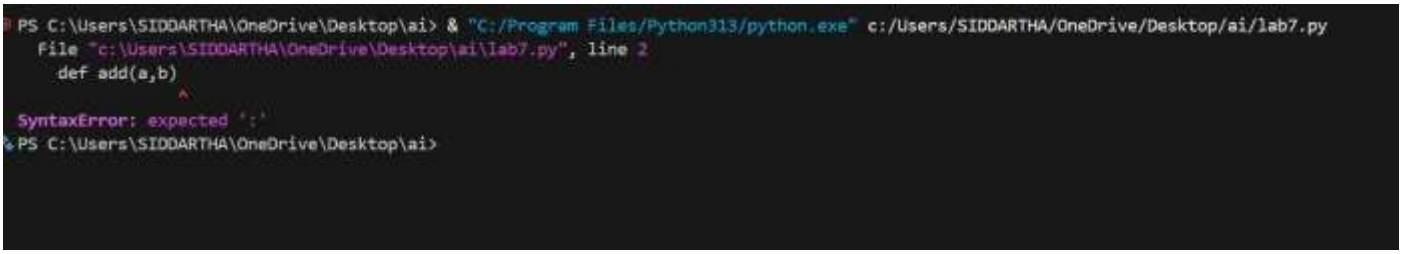
Task 1: Fixing Syntax Errors

Scenario: You are reviewing a Python program where a basic function definition contains a syntax error.

Code:

```
#Task-01:
def add(a,b)
    return a+b
# Function to add two numbers
# Error: Missing colon (:) at the end of function definition
# Syntax Error - def add(a, b) is missing a colon

# CORRECTED CODE:
def add(a, b):
    """Function that takes two parameters and returns their
sum"""
    return a + b

# Test the function
result = add(5, 3)
print(f"The sum of 5 and 3 is: {result}")
```

Output:



Task 2: Debugging Logic Errors in Loops

Scenario: You are debugging a loop that runs infinitely due to a logical mistake.

Code:

```python
#Task-02:
# Infinite Loop - ERROR VERSION
print("ERROR VERSION - Infinite Loop:")
i = 0
while i < 5:
    print(f"Iteration {i}")
    # Problem: i is never incremented, so the loop never exits
    # The condition i < 5 is always True

# CORRECTED CODE:
print("\nCORRECTED VERSION:")
i = 0
while i < 5:
    print(f"Iteration {i}")
    i += 1  # Increment i by 1 each iteration to eventually reach the exit condition
```

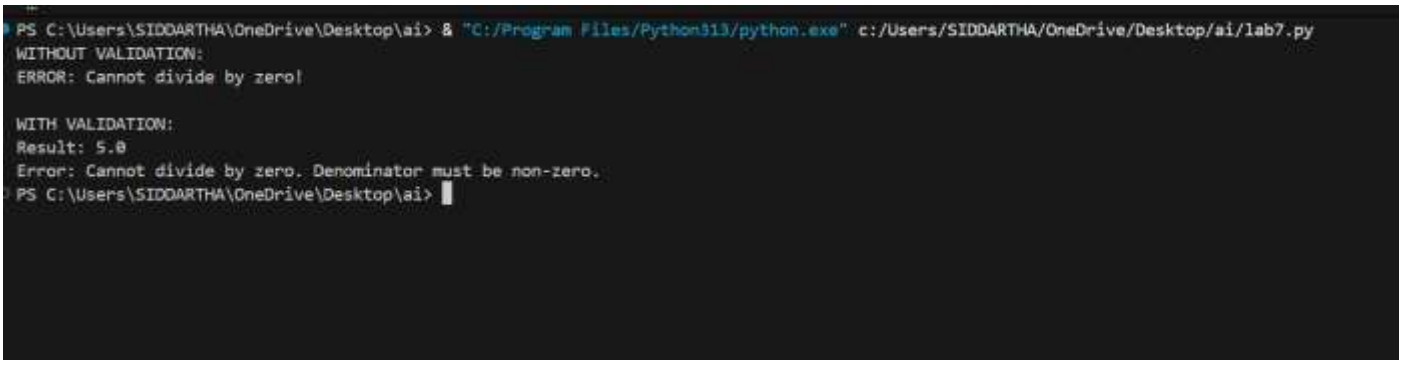
Output:

Task 3: Handling Runtime Errors (Division by Zero)

Code:

```
#Task 3: Handling Runtime Errors (Division by Zero)
# Function WITHOUT validation (causes runtime error)
def divide_without_validation(a, b):
    """Division function with no error handling - will crash
if b is 0"""
    return a / b

# Test - this will crash
print("WITHOUT VALIDATION:")
try:
    result = divide_without_validation(10, 0)
    print(f"Result: {result}")
except ZeroDivisionError:
    print("ERROR: Cannot divide by zero!")

# Function WITH try-except blocks (safe execution)
def divide_with_validation(a, b):
    """Division function with error handling using try-
except"""
    try:
        # Attempt the division operation
        result = a / b
        return result
    except ZeroDivisionError:
        # Catch division by zero error
        print("Error: Cannot divide by zero. Denominator must
be non-zero.")
        return None
    except TypeError:
        # Catch type errors (non-numeric values)
        print("Error: Both arguments must be numbers.")
        return None

# Test - safe execution
print("\nWITH VALIDATION:")
result = divide_with_validation(10, 2)
if result is not None:
    print(f"Result: {result}")

result = divide_with_validation(10, 0)
```

Output:



Task 4: Debugging Class Definition Errors

Code:

```
#Task 4: Debugging Class Definition Errors
# FAULTY CODE - Missing 'self' parameter in __init__()
print("\nFAULTY CLASS DEFINITION:")
class Person:
    """Class definition with ERROR in constructor"""
    def __init__(name, age):  # ERROR: Missing 'self' as first
parameter
        """Constructor without self parameter - causes
TypeError"""
        name = name
        age = age

# This will cause an error when trying to create an instance
# TypeError: __init__() takes 2 positional arguments but 3
were given
# try:
#     person1 = Person("Alice", 30)
# except TypeError as e:
#     print(f"ERROR: {e}")

# CORRECTED CODE - Proper class definition with 'self'
parameter
print("\nCORRECTED CLASS DEFINITION:")
class Person:
    """Class definition with proper constructor including
'self' parameter"""
    def __init__(self, name, age):
        """Constructor with 'self' parameter - allows proper
object creation
        self: represents the instance of the class
        name: parameter for person's name
        age: parameter for person's age"""
        self.name = name  # Store name as instance variable
        self.age = age    # Store age as instance variable

    def display_info(self):
        """Method to display person's information"""
        print(f"Name: {self.name}, Age: {self.age}")
```

```
# Test - safe execution with corrected class
try:
    person1 = Person("Alice", 30)
    person1.display_info()

    person2 = Person("Bob", 25)
    person2.display_info()
except TypeError as e:
    print(f"ERROR: {e}")
```

Output:

Task 5: Resolving Index Errors in Lists

Code:

```
#Task-05: Handling Index Errors (Out-of-Range List Access)


# Function WITHOUT validation (causes runtime error)
def access_list_without_validation(lst, index):
    """Function that accesses list without bounds checking -
will crash if index is out of range"""
    return lst[index]

# Test - this will crash
print("WITHOUT VALIDATION:")
try:
    my_list = [10, 20, 30, 40, 50]
    result = access_list_without_validation(my_list, 10)  #
Index 10 doesn't exist (list has only 5 elements)
    print(f"Value at index 10: {result}")
except IndexError:
    print("ERROR: List index out of range!")

# Function WITH try-except blocks (safe execution)
def access_list_with_validation(lst, index):
    """Function that accesses list with error handling using
try-except"""
    try:
        # Attempt to access the list at given index
        result = lst[index]
        return result
    except IndexError:
```

```
        # Catch index out of range error
        print(f"Error: Index {index} is out of range. List has
only {len(lst)} elements.")
        return None
    except TypeError:
        # Catch type errors (non-numeric index)
        print("Error: Index must be an integer.")
        return None

# Test - safe execution
print("\nWITH VALIDATION:")
my_list = [10, 20, 30, 40, 50]

result = access_list_with_validation(my_list, 2)
if result is not None:
    print(f"Value at index 2: {result}")

result = access_list_with_validation(my_list, 10)
```

Output: