

## LAB-7.4

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### Task Description #1:

- Introduce a buggy Python function that calculates the factorial of a number using recursion. Use Copilot or Cursor AI to detect and fix the logical or syntax errors.

```
def factr(n):
    # Convert string to integer if needed
    if isinstance(n, str):
        n = int(n)

    if n == 0:
        return 1 # Factorial of 0 is 1
    elif n == 1:
        return 1
    else:
        return n * factr(n - 1) # Should be n-1, not n-2

print(factr("5"))
```

OUTPUT:

```
neDrive/Desktop/AIAC/Lab-7/Task1.py"
120
```

```
def factr(n):
    # Convert string to integer if needed
    if isinstance(n, str):
        n = int(n)

    if n == 0:
        return 1 # Factorial of 0 is 1
    elif n == 1:
        return 1
    else:
        return n * factr(n - 1) # Should be n-1, not n-2

print(factr("5"))
```

OUTPUT:

```
Sers\Rishitha Reddy\OneDrive\Desktop\AIAC\Lab-7\Task1.1.py
120
PS C:\Users\Rishitha Reddy\OneDrive\Desktop\web folder>
```

### Task Description #2:

- Provide a list sorting function that fails due to a type error (e.g., sorting list with mixed integers and strings). Prompt AI to detect the issue and fix the code for consistent sorting.

```
def sort_list(data):
    # Separate numbers and strings
    numbers = [x for x in data if isinstance(x, (int, float))]
    strings = [x for x in data if isinstance(x, str)]

    # Sort each type separately
    numbers.sort()
    strings.sort()

    # Return combined sorted list (numbers first, then strings)
    return numbers + strings

items = [3, "apples", 1, "banana", 2]
print(sort_list(items))
```

OUTPUT:

```
neDrive/Desktop/AIAC/Lab-7/Task2.py
[1, 2, 3, 'apples', 'banana']
PS C:\Users\Rishitha Reddy\OneDrive\Desktop\AIAC\Lab-4> |
```

```
def sort_list(data):  
    # Separate numbers and strings  
    numbers = [x for x in data if isinstance(x, (int, float))]  
    strings = [x for x in data if isinstance(x, str)]  
  
    # Sort each type separately  
    numbers.sort()  
    strings.sort()  
  
    # Return combined sorted list (numbers first, then strings)  
    return numbers + strings  
  
items = [3, "apples", 1, "banana", 2]  
print(sort_list(items))
```

OUTPUT:

```
PS C:\Users\Rishitha Reddy\OneDrive\Desktop\web folder> & "C:/Users/Rishitha Reddy/OneDrive/Desktop/AIAC/Lab-7/Task2.1.py"  
[1, 2, 3, 'apples', 'banana']  
PS C:\Users\Rishitha Reddy\OneDrive\Desktop\web folder>
```

### Task Description #3:

- Write a Python snippet for file handling that opens a file but forgets to close it. Ask Copilot or Cursor AI to improve it using the best practice (e.g., with open() block).

```

with open("example.txt", "w") as f:
    f.write("Hello, world!")
f1=open("data1.txt", "w")
f2=open("data2.txt", "w")
f1.write("First file content\n")
f2.write("Second file content\n")
print("Files written successfully")
import os
if not os.path.exists("input.txt"):
    with open("input.txt", "w") as temp_input:
        temp_input.write("Sample input line 1\nSample input line 2\n")
    data = open("input.txt", "r").readlines()
    output = open("output.txt", "w")
    for line in data:
        output.write(line.upper())
    print("Processing done")

import os
if not os.path.exists("numbers.txt"):
    with open("numbers.txt", "w") as nf:
        nf.write("1\n2\n3\n4\n5\n") # Example numbers

with open("numbers.txt", "r") as f:
    nums = f.readlines()
squares = []
for n in nums:
    n = n.strip()
    if n.isdigit():
        squares.append(int(n) * int(n))
with open("squares.txt", "w") as f2:
    for sq in squares:
        f2.write(str(sq) + "\n")
print("Squares written")

```

#### OUTPUT:

```

C:\Users\Rishitha Reddy\OneDrive\Desktop\AIAC\Lab-4>
Files written successfully
Squares written
PS C:\Users\Rishitha Reddy\OneDrive\Desktop\AIAC\Lab-4>

```

```

with open("example.txt","w") as f:
    f.write("Hello,world!")
    f1=open("data1.txt","w")
    f2=open("data2.txt","w")
    f1.write("First file content\n")
    f2.write("Second file content\n")
    print("Files written successfully")
import os
if not os.path.exists("input.txt"):
    with open("input.txt", "w") as temp_input:
        temp_input.write("Sample input line 1\nSample input
data = open("input.txt", "r").readlines()
output = open("output.txt", "w")
for line in data:
    output.write(line.upper())
    print("Processing done")

import os
if not os.path.exists("numbers.txt"):
    with open("numbers.txt", "w") as nf:
        nf.write("1\n2\n3\n4\n5\n") # Example numbers

with open("numbers.txt", "r") as f:
    nums = f.readlines()
squares = []
for n in nums:
    n = n.strip()
    if n.isdigit():
        squares.append(int(n) * int(n))
with open("squares.txt", "w") as f2:
    for sq in squares:
        f2.write(str(sq) + "\n")
print("Squares written")

```

OUTPUT:

```

sers/Rishitha Reddy/OneDrive/Desktop/AIAC/Lab-7/task3.1.py"
Files written successfully
Squares written
PS C:\Users\Rishitha Reddy\OneDrive\Desktop\web folder>

```



### Task Description #4:

- Provide a piece of code with a `ZeroDivisionError` inside a loop. Ask AI to add error handling using `try-except` and continue execution safely.

A screenshot of a Python IDE window. The top bar shows the file path: C:\Users\Rishitha Reddy\OneDrive\Desktop > Desktop > AIAC > Lab-7 > Task4.py > ... . The editor contains a Python script:

```
1 def compute_ratios(values):  
2     results = []  
3     for i in range(len(values)):  
4         for j in range(i + 1, len(values)): # Start from i+1 to avoid division by zero  
5             if values[j] != values[i]: # Check for division by zero  
6                 ratio = values[i] / (values[j] - values[i])  
7                 results.append((i, j, ratio))  
8     return results  
9  
10 values = [5, 10, 15, 20, 25]  
11 print(compute_ratios(values))
```

The bottom panel has tabs for Problems, Output, Debug Console, Terminal, and Ports. The Terminal tab is active, showing the command prompt output:

```
PS C:\Users\Rishitha Reddy\OneDrive\Desktop\AIAC\Lab-4> & "C:/Users/Rishitha Reddy/AppData/Local/Programs/Python/Python313/python.exe" "C:/Users/Rishitha Reddy/OneDrive/Desktop/AIAC/Lab-7/Task4.py"  
[(0, 1, 1.0), (0, 2, 0.5), (0, 3, 0.3333333333333333), (0, 4, 0.25), (1, 2, 2.0), (1, 3, 1.0), (1, 4, 0.6666666666666666), (2, 3, 3.0), (2, 4, 1.5), (3, 4, 4.0)]
```

C:\Users\Rishitha Reddy\OneDrive\Desktop > Desktop > AIAC > Lab-7 > Task4.py > ...

```
1 def compute_ratios(values):  
2     results = []  
3     for i in range(len(values)):  
4         for j in range(i + 1, len(values)): # Start from i+1 to avoid division by zero  
5             if values[j] != values[i]: # Check for division by zero  
6                 ratio = values[i] / (values[j] - values[i])  
7                 results.append((i, j, ratio))  
8     return results  
9  
10 values = [5, 10, 15, 20, 25]  
11 print(compute_ratios(values))
```

Problems    Output    Debug Console    **Terminal**    Ports

Python    +    -    ☐    ⋮    ^    v

```
PS C:\Users\Rishitha Reddy\OneDrive\Desktop\AIAC\Lab-4> & "C:/Users/Rishitha Reddy/AppData/Local/Programs/Python/Python313/python.exe" "C:/Users/Rishitha Reddy/OneDrive/Desktop/AIAC/Lab-7/Task4.py"  
[(0, 1, 1.0), (0, 2, 0.5), (0, 3, 0.3333333333333333), (0, 4, 0.25), (1, 2, 2.0), (1, 3, 1.0), (1, 4, 0.6666666666666666), (2, 3, 3.0), (2, 4, 1.5), (3, 4, 4.0)]
```

PS C:\Users\Rishitha Reddy\OneDrive\Desktop\AIAC\Lab-4>

```
1 def compute_ratios(values):
2     results = []
3     for i in range(len(values)):
4         for j in range(i + 1, len(values)): # Start from i+1 to avoid division by zero
5             if values[j] != values[i]: # Check for division by zero
6                 ratio = values[i] / (values[j] - values[i])
7                 results.append((i, j, ratio))
8     return results
9
10 values = [5, 10, 15, 20, 25]
11 print(compute_ratios(values))
```

OUTPUT:

```
[(0, 1, 1.0), (0, 2, 0.5), (0, 3, 0.3333333333333333), (0, 4, 0.25), (1, 2, 2.0), (1, 3, 1.0), (1, 4, 0.6666666666666666), (2, 3, 3.0), (2, 4, 1.5), (3, 4, 4.0)]
```

### Task Description #5:

- Include a buggy class definition with incorrect `__init__` parameters or attribute references. Ask AI to analyze and correct the constructor and attribute usage

```

class StudentRecord:
    def __init__(self, name, id, courses=None):
        if courses is None:
            courses = []
        self.student_name = name
        self.student_id = id
        self.courses = courses

    def add_course(self, course):
        self.courses.append(course)

    def get_summary(self):
        return f"Student: {self.student_name}, ID: {self.student_id}, Courses: {' , '.join(self.courses)}"

class Department:
    def __init__(self, dept_name, students=None):
        self.dept_name = dept_name
        if students is None:
            students = []
        self.students = students

    def enroll_student(self, student):
        self.students.append(student)

    def department_summary(self):
        return f"Department: {self.dept_name}, Total Students: {len(self.students)}"

s1 = StudentRecord("Alice", 101, ["Math", "Science"])
d1 = Department("Computer Science")
d1.enroll_student(s1)
print(s1.get_summary())
print(d1.department_summary())

```

OUTPUT:

```

C:\Users\Rishitha Reddy\OneDrive\Desktop\AIAC\Lab-4>
Student: Alice, ID: 101, Courses: Math, Science
Department: Computer Science, Total Students: 1
PS C:\Users\Rishitha Reddy\OneDrive\Desktop\AIAC\Lab-4>

```

```

1 class StudentRecord:
2     def __init__(self, name, id, courses=None):
3         if courses is None:
4             courses = []
5         self.student_name = name
6         self.student_id = id
7         self.courses = courses
8
9     def add_course(self, course):
10        self.courses.append(course)
11
12    def get_summary(self):
13        return f"Student: {self.student_name}, ID: {self.student_id}, Courses: {' , '.join(self.courses)}"
14
15 class Department:
16     def __init__(self, dept_name, students=None):
17         self.dept_name = dept_name
18         if students is None:
19             students = []
20         self.students = students
21
22     def enroll_student(self, student):
23         self.students.append(student)
24
25     def department_summary(self):
26         return f"Department: {self.dept_name}, Total Students: {len(self.students)}"
27
28 s1 = StudentRecord("Alice", 101, ["Math", "Science"])
29 d1 = Department("Computer Science")
30 d1.enroll_student(s1)
31 print(s1.get_summary())
32 print(d1.department_summary())

```

sers/Rishitha Reddy/OneDrive/Desktop/AIAC/Lab-7/Task5.1.py"

Student: Alice, ID: 101, Courses: Math, Science

Department: Computer Science, Total Students: 1

PS C:\Users\Rishitha Reddy\OneDrive\Desktop\web folder>