

ASSIGNMENT-7.4

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Task 1 – Debugging Recursive Factorial Function

AI Prompt Used

Debug this recursive factorial Python function. It crashes and gives wrong output.

INCORRECT CODE:-

The screenshot shows a Jupyter Notebook cell with the following code:

```
[1] ① 0s
    def factorial(n):
        return n * factorial(n-1)

    print(factorial(5))

...
RecursionError: maximum recursion depth exceeded
/tmp/ipython-input-237490542.py in <cell line: 0>()
    2     return n * factorial(n-1)
    3
----> 4 print(factorial(5))

... last 1 frames repeated, from the frame below ...

/tmp/ipython-input-237490542.py in factorial(n)
    1 def factorial(n):
----> 2     return n * factorial(n-1)
    3
    4 print(factorial(5))

RecursionError: maximum recursion depth exceeded
```

Next steps: (Explain error)

The code defines a recursive factorial function that calls itself with `n-1`. When it reaches `n=0`, it triggers a `RecursionError: maximum recursion depth exceeded`.

CORRECT CODE:-

```
5 ⏎ def factorial(n):
6     if n == 0 or n == 1:
7         return 1
8     return n * factorial(n-1)
9
10    print(factorial(5))
11
12    ...
13    120
```

Task 2 – Fixing Data Type Errors in Sorting

AI Prompt Used

Why does this Python sorting code fail with mixed data types?

INCORRECT CODE:-

```
1 ⏎ data = [10, "5", 3, "20"]
2   print(sorted(data))
3
4   ...
5   -----
6   TypeError                                 Traceback (most recent call last)
7   /tmp/ipython-input-3202248591.py in <cell line: 0>()
8       1 data = [10, "5", 3, "20"]
9   ----> 2 print(sorted(data))
10
11   TypeError: '<' not supported between instances of 'str' and 'int'
```

Next steps: [Explain error](#)

CORRECTED CODE:-

```
▶ data = [10, "5", 3, "20"]

    data = [int(x) for x in data]
print(sorted(data))

...
[3, 5, 10, 20]
```

Task 3 – Improving File Handling Reliability

AI Prompt Used

Identify issue in Python file handling code that doesn't close files.

INCORRECT CODE:-

```
▶ file = open("sample.txt", "r")
  data = file.read()
  print(data)

...
-----
FileNotFoundError                         Traceback (most recent call last)
/tmp/ipython-input-4071061266.py in <cell line: 0>()
      1 file = open("sample.txt", "r")
      2 data = file.read()
      3 print(data)

FileNotFoundError: [Errno 2] No such file or directory: 'sample.txt'

Next steps: Explain error
```

CORRECT CODE:-

```
try:
    with open("sample.txt", "r") as file:
        data = file.read()
        print(data)
except FileNotFoundError:
    print("File not found.")

... File not found.
```

Task 4 – Handling Runtime Errors in Loop

AI Prompt Used

Fix ZeroDivisionError in loop so program continues running.

INCORRECT CODE:-

```
for n in nums:
    print(10/n)

...
2.0
-----
ZeroDivisionError                                 Traceback (most recent call last)
/tmp/ipython-input-2622015173.py in <cell line: 0>()
      2
      3 for n in nums:
----> 4     print(10/n)

ZeroDivisionError: division by zero

Next steps: Explain error
```

CORRECT CODE:-

```
▶ nums = [5, 0, 2]

for n in nums:
    try:
        print(10/n)
    except ZeroDivisionError:
        print("Cannot divide by zero")

...
2.0
Cannot divide by zero
5.0
```

Task 5 – Debugging Class Initialization Errors

AI Prompt Used

Debug this Python class constructor error.

INCORRECT CODE:-

```
▶ class Student:
    def __init__(name, age):
        name = name
        age = age

    s = Student("Rahul", 20)
    print(s.name)

...
-----
TypeError                                     Traceback (most recent call last)
/tmp/ipython-input-3406629822.py in <cell line: 0>()
      4         age = age
      5
----> 6     s = Student("Rahul", 20)
      7     print(s.name)

TypeError: Student.__init__() takes 2 positional arguments but 3 were given
```

Next steps: [Explain error](#)

CORRECT CODE:-

```
▶ class Student:  
    def __init__(self, name, age):  
        self.name = name  
        self.age = age  
  
    s = Student("ROHAN", 20)  
    print(s.name, s.age)
```

... ROHAN 20