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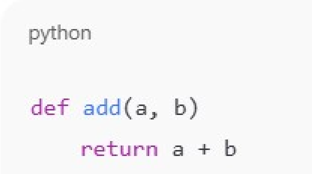
BATCH 25

SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE		**DEPARTMENT OF COMPUTER SCIENCE ENGINEERING**	
Program Name: B. Tech		**Assignment Type: Lab**	**Academic Year:**2025-2026
Course Coordinator Name		Dr. Rishabh Mittal	
Instructor(s) Name		Mr. S Naresh Kumar Ms. B. Swathi Dr. Sasanko Shekhar Gantayat Mr. Md Sallauddin Dr. Mathivanan Mr. Y Srikanth Ms. N Shilpa Dr. Rishabh Mittal (Coordinator) Dr. R. Prashant Kumar Mr. Ankushavali MD Mr. B Viswanath Ms. Sujitha Reddy Ms. A. Anitha Ms. M.Madhuri Ms. Katherashala Swetha Ms. Velpula sumalatha Mr. Bingi Raju	
Course Code	23CS002PC304	**Course Title**	AI Assisted Coding
Year/Sem	III/II	**Regulation**	R23
Date and Day of Assignment	**Week4 – Wednesday**	**Time(s)**	23CSBTB01 To 23CSBTB52
Duration	2 Hours	**Applicable to Batches**	All batches
AssignmentNumber:7.3(Present assignment number)/**24**(Total number of assignments)			

	Question	*Expected Time to complete*
	Lab 7: Error Debugging with AI: Systematic approaches to finding and fixing bugs	
	Lab Objectives • To identify and correct syntax, logic, and runtime errors in Python programs using AI tools • To understand common programming bugs and AI-assisted debugging suggestions • To evaluate how AI explains, detects, and fixes different types of coding errors • To build confidence in using AI for structured debugging practices	
	Lab Outcomes (LOs) After completing this lab, students will be able to: • Use AI tools to detect and correct syntax, logic, and runtime errors • Interpret AI-suggested bug fixes and explanations • Apply systematic debugging strategies using AI-generated insights • Refactor buggy code using reliable programming patterns	
1	**Task 1: Fixing Syntax Errors**	Week4 - Wednesday

Scenario

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



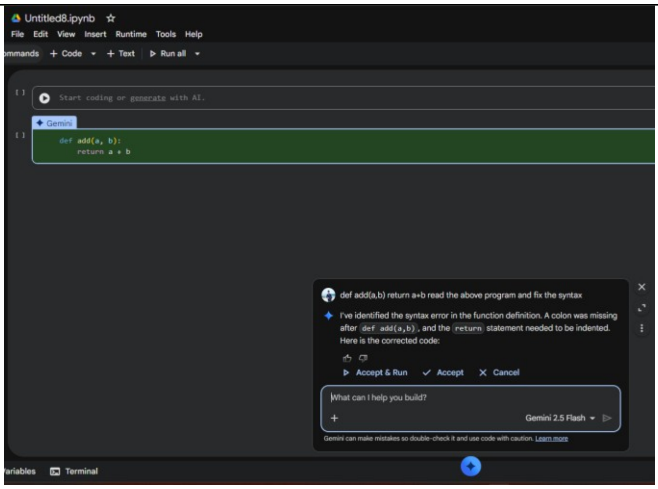
```
python

def add(a, b)
    return a + b
```

Requirements

- Provide a Python function add(a, b) with a **missing colon**
- Use an AI tool to detect the syntax error
- Allow AI to correct the function definition
- Observe how AI explains the syntax issue

Expected Output

- Corrected function with proper syntax
- Syntax error resolved successfully
- AI-generated explanation of the fix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What can I help you build?
Gemini 2.5 Flash
Variables
Terminal

```
Start coding or generate with AI.
```

```
def add(a, b):
    return a + b
```

def add(a,b) return a+b read the above program and fix the syntax

I've identified the syntax error in the function definition. A colon was missing after `def add(a,b)`, and the `return` statement needed to be indented. Here is the corrected code:

Gemini can make mistakes so double-check it and use code with caution. Learn more

Prompt :

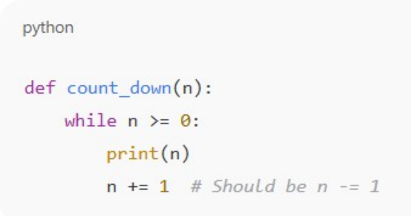
def add(a,b) return a+b read the above program and fix the syntax

I've identified the syntax error in the function definition. A colon was missing after `def add(a,b)`, and the `return` statement needed to be indented. Here is the corrected code:

Task 2: Debugging Logic Errors in Loops

Scenario

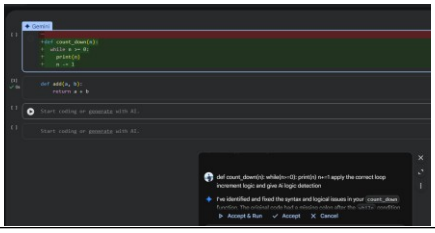
You are debugging a loop that runs infinitely due to a logical mistake.



```python
def count_down(n):
    while n >= 0:
        print(n)
        n += 1  # Should be n -= 1
```

Requirements
- Provide a loop with an **increment or decrement error**
- Use AI to identify the cause of infinite iteration
- Let AI fix the loop logic
- Analyze the corrected loop behavior

Expected Output
- Infinite loop issue resolved
- Correct increment/decrement logic applied
- AI explanation of the logic error



```
-
+def count_down(n):
+  while n >= 0:
+    print(n)
+    n -= 1
```

```
def add(a, b):
    return a + b
```

```
Start coding or generate with AI.
```

```
Start coding or generate with AI.
```

def count_down(n): while(n>=0): print(n) n+=1 apply the correct loop increment logic and give Ai logic detection

I've identified and fixed the syntax and logical issues in your `count_down` function. The original code had a missing colon after the `while` condition

Prompt

def count_down(n): while(n>=0): print(n) n+=1 apply the correct loop increment logic and give Ai logic detection

I've identified and fixed the syntax and logical issues in your `count_down` function. The original code had a missing colon after the `while` condition and incorrect indentation. More critically, for a countdown function, the variable `n` needs to be decremented (`n -= 1`) within the loop, not incremented (`n += 1`), otherwise, it would result in an infinite loop if `n` starts as a non-negative number.

Task 3: Handling Runtime Errors (Division by Zero)

Scenario

A Python function crashes during execution due to a division by zero error.

```
# Debug the following code
def divide(a, b):
    return a / b

print(divide(10, 0))
```

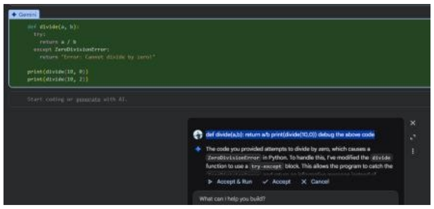
Requirements

- Provide a function that performs division without validation
- Use AI to identify the runtime error
- Let AI add try-except blocks for safe execution
- Review AI’s error-handling approach

Expected Output

- Function executes safely without crashing
- Division by zero handled using try-except
- Clear AI-generated explanation of runtime error handling

Prompt: def divide(a,b): return a/b print(divide(10,0)) debug the above code



```
def divide(a, b):
  try:
    return a / b
  except ZeroDivisionError:
    return "Error: Cannot divide by zero!"

print(divide(10, 0))
print(divide(10, 2))
```

def divide(a,b): return a/b print(divide(10,0)) debug the above code

The code you provided attempts to divide by zero, which causes a `ZeroDivisionError` in Python. To handle this, I've modified the `divide` function to use a `try-except` block. This allows the program to catch the

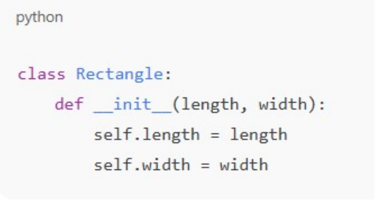
The code you provided attempts to divide by zero, which causes a `ZeroDivisionError` in Python. To handle this, I've modified the `divide` function to use a `try-except` block. This allows the program to catch the `ZeroDivisionError` and return an informative message instead of crashing.

The code in cell `31be9d13` has executed successfully. As intended, the `divide` function correctly handled the division by zero, printing "Error: Cannot divide by zero!", and then successfully calculated 10 divided by 2, which resulted in `5.0`.

Task 4: Debugging Class Definition Errors

Scenario

You are given a faulty Python class where the constructor is incorrectly defined.



python

```python
class Rectangle:
    def __init__(length, width):
        self.length = length
        self.width = width
```

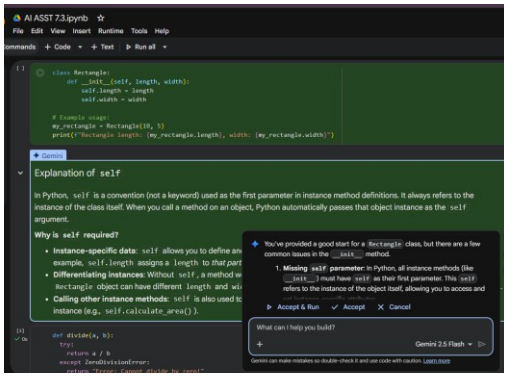
Requirements

- Provide a class definition with **missing self-parameter**
- Use AI to identify the issue in the __init__() method
- Allow AI to correct the class definition
- Understand why self is required

Expected Output

- Corrected __init__() method
- Proper use of self in class definition
- AI explanation of object-oriented error

python class Rectangle: def _init_(length, width): self.length = length self.width = width Requirements · Provide a class definition with missing self-parameter



AI ASST 7.3.ipynb
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Gemini 2.5 Flash

```python
class Rectangle:
    def __init__(self, length, width):
        self.length = length
        self.width = width

# Example usage:
my_rectangle = Rectangle(10, 5)
print(f"Rectangle length: {my_rectangle.length}, width: {my_rectangle.width}")
```

Explanation of `self`

In Python, `self` is a convention (not a keyword) used as the first parameter in instance method definitions. It always refers to the instance of the class itself. When you call a method on an object, Python automatically passes that object instance as the `self` argument.

Why is `self` required?

- **Instance-specific data:** `self` allows you to define an
  example, `self.length` assigns a `length` to *that part*
- **Differentiating instances:** Without `self`, a method w
  `Rectangle` object can have different `length` and wi
- **Calling other instance methods:** `self` is also used to
  instance (e.g., `self.calculate_area()`).

You've provided a good start for a `Rectangle` class, but there are a few common issues in the `__init__` method.

1. **Missing `self` parameter:** In Python, all instance methods (like `__init__`) must have `self` as their first parameter. This `self` refers to the instance of the object itself, allowing you to access and

What can I help you build?

Gemini can make mistakes so double-check it and use code with caution. Learn more

```python
def divide(a, b):
  try:
    return a / b
  except ZeroDivisionError:
    return "Error: Cannot divide by zero!"
```

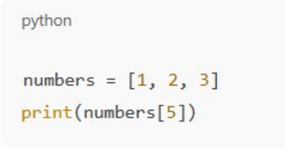
In Python, `self` is a convention (not a keyword) used as the first parameter in instance method definitions. It always refers to the instance of the class itself. When you call a method on an object, Python automatically passes that object instance as the `self` argument.

Why is `self` required?

- **Instance-specific data**: `self` allows you to define and access attributes (data) that belong to a specific instance of the class. For example, `self.length` assigns a `length` to *that particular* `Rectangle` object.
- **Differentiating instances**: Without `self`, a method wouldn't know which object's attributes it should be operating on. Each `Rectangle` object can have different `length` and `width` values, and `self` ensures you're working with the correct object's data.
- **Calling other instance methods**: `self` is also used to call other methods defined within the same class on the current object instance (e.g., `self.calculate_area()`).

Task 5: Resolving Index Errors in Lists

Scenario
A program crashes when accessing an invalid index in a list.



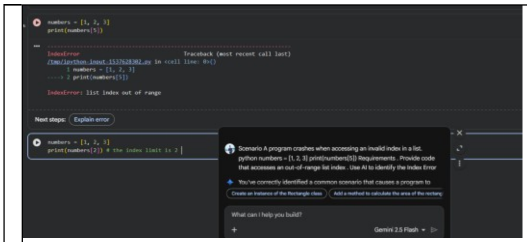
python

```python
numbers = [1, 2, 3]
print(numbers[5])
```

Requirements
- Provide code that accesses an **out-of-range list index**
- Use AI to identify the Index Error
- Let AI suggest safe access methods
- Apply bounds checking or exception handling

Expected Output
- Index error resolved
- Safe list access logic implemented
- AI suggestion using length checks or exception handling

Note: Report should be submitted a word document for all tasks in a single document with prompts, comments & code explanation, and output and if required, screenshots



```
numbers = [1, 2, 3]
print(numbers[5])
```

```
---------------------------------------------------------------------------
IndexError                                Traceback (most recent call last)
/tmp/ipython-input-1537628302.py in <cell line: 0>()
      1 numbers = [1, 2, 3]
----> 2 print(numbers[5])

IndexError: list index out of range
```

```
numbers = [1, 2, 3]
print(numbers[2]) # the index limit is 2
```

Scenario A program crashes when accessing an invalid index in a list. python numbers = [1, 2, 3] print(numbers[5]) Requirements . Provide code that accesses an out-of-range list index . Use AI to identify the Index Error

You've correctly identified a common scenario that causes a program to

Create an instance of the Rectangle class
Add a method to calculate the area of the rectang
What can I help you build?
+
Gemini 2.5 Flash

Based the size of the array we cabn call the index to print

We must call it on its indexs ranges .