ASSIGNMENT-7.3

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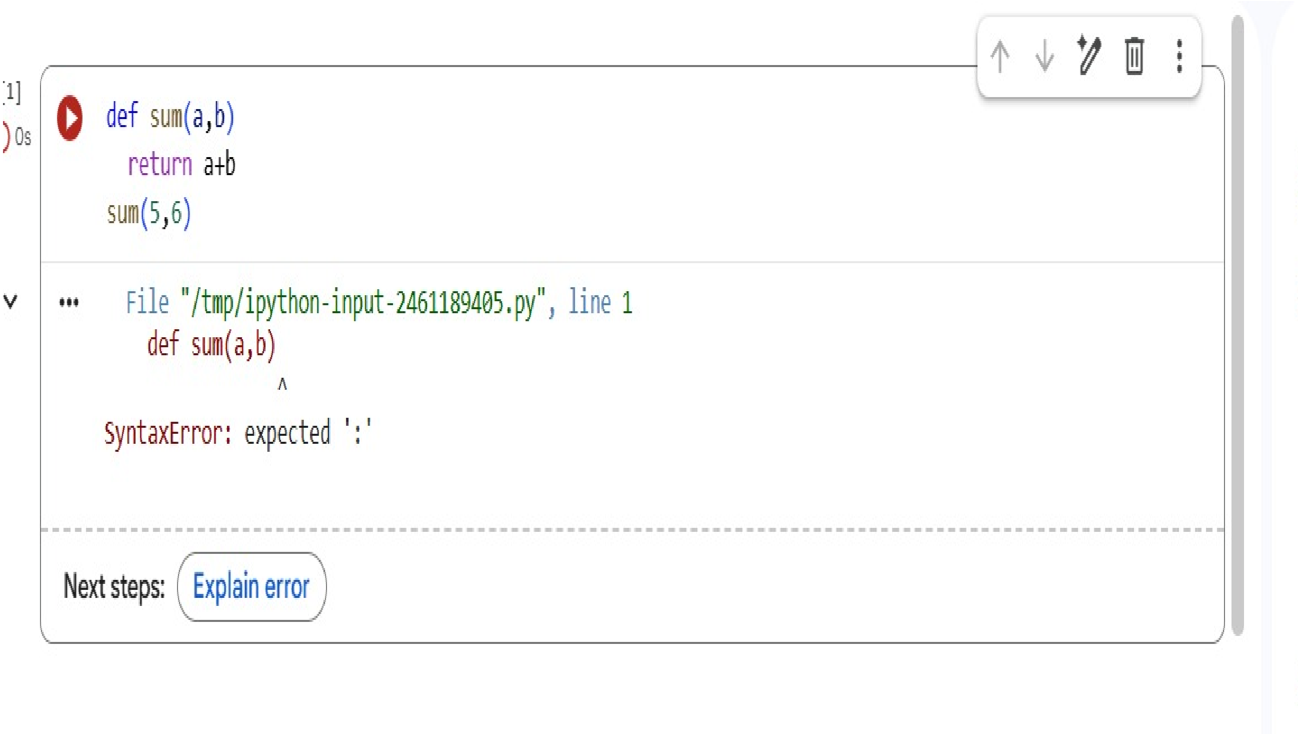
Batch: 05

Task-01:Fixing Syntax Errors

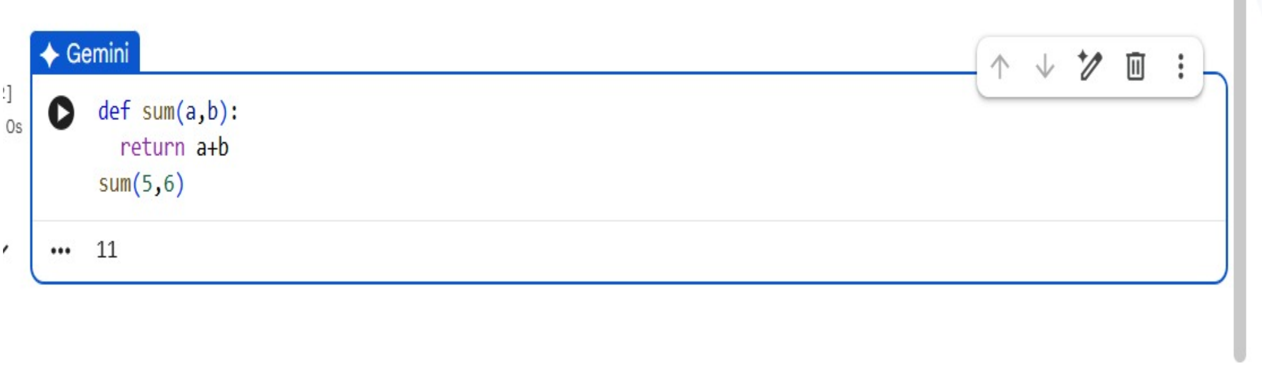
Identification of error:



```
def sum(a,b)
  return a+b
sum(5,6)
```

```
  File "/tmp/ipython-input-2461189405.py", line 1
    def sum(a,b)
                ^
SyntaxError: expected ':'
```

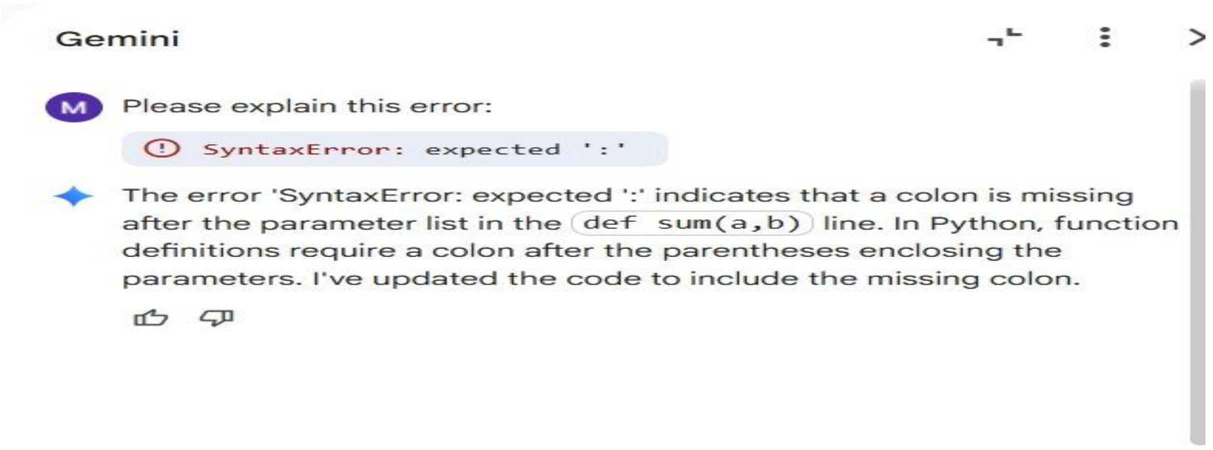
Fixing Error:



```
def sum(a,b):
  return a+b
sum(5,6)
```

```
11
```

Explanation of Error:



Please explain this error:

`SyntaxError: expected ':'`

The error 'SyntaxError: expected ':' indicates that a colon is missing after the parameter list in the `def sum(a,b)` line. In Python, function definitions require a colon after the parentheses enclosing the parameters. I've updated the code to include the missing colon.

Explanation of code:

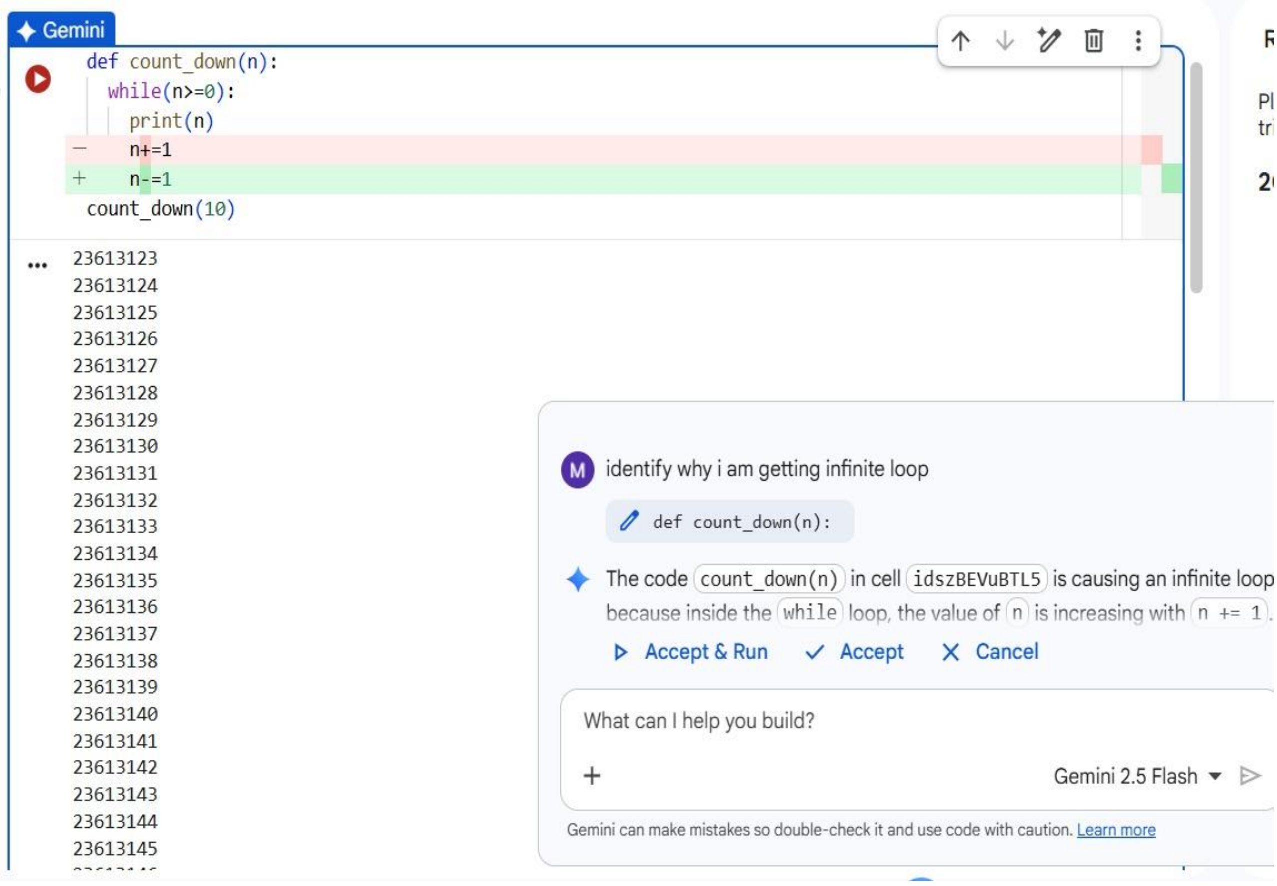
EXPLANATION:

- A Python function named add(a, b) is created to perform addition.
- The function definition initially has a syntax error because the colon (:) is missing.
- When the program is executed, Python raises a syntax error.

- The AI tool analyzes the code and identifies the missing colon as the issue.
- The function definition is corrected by adding the required colon.
- The corrected function follows proper Python syntax rules.
- The function executes successfully and returns the correct result.

Task-02:Debugging Logic Errors in Loops

Identification of Error:



```
def count_down(n):
  while(n>=0):
    print(n)
-     n+=1
+     n-=1
count_down(10)
```

```
23613123
23613124
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23613142
23613143
23613144
23613145
```

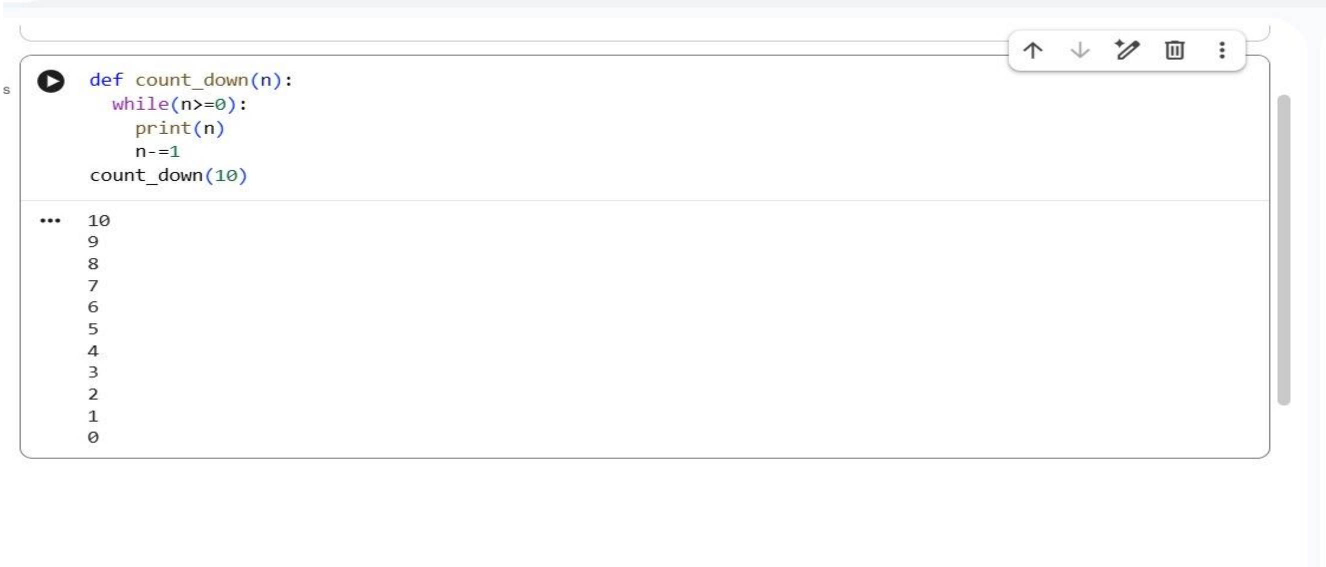
identify why i am getting infinite loop

`def count_down(n):`

The code `count_down(n)` in cell `idszBEVuBTL5` is causing an infinite loop because inside the `while` loop, the value of `n` is increasing with `n += 1`.

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

Fixing Error:



```
def count_down(n):
  while(n>=0):
    print(n)
    n-=1
count_down(10)
```

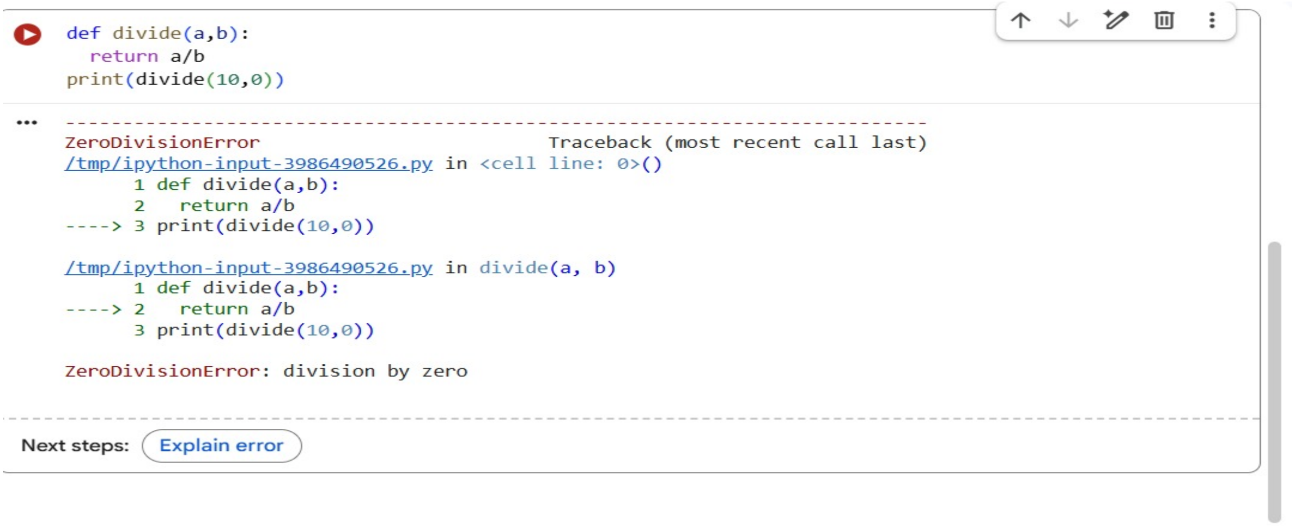
```
10
9
8
7
6
5
4
3
2
1
0
```

Explanation of Code:

- A loop is written with a logical error in its increment/decrement statement.
- Due to this mistake, the loop condition never becomes false, causing infinite execution.
- When the program is run, the loop continues indefinitely without termination.
- The AI tool analyzes the loop condition and identifies the incorrect increment/decrement logic.
- The loop logic is corrected so that the loop control variable moves toward the terminating condition.
- After correction, the loop executes a finite number of times.
- The infinite loop issue is resolved, and the program behaves as expected.

Task-03:Handling Runtime Errors (Division by Zero)

Identification of Error:



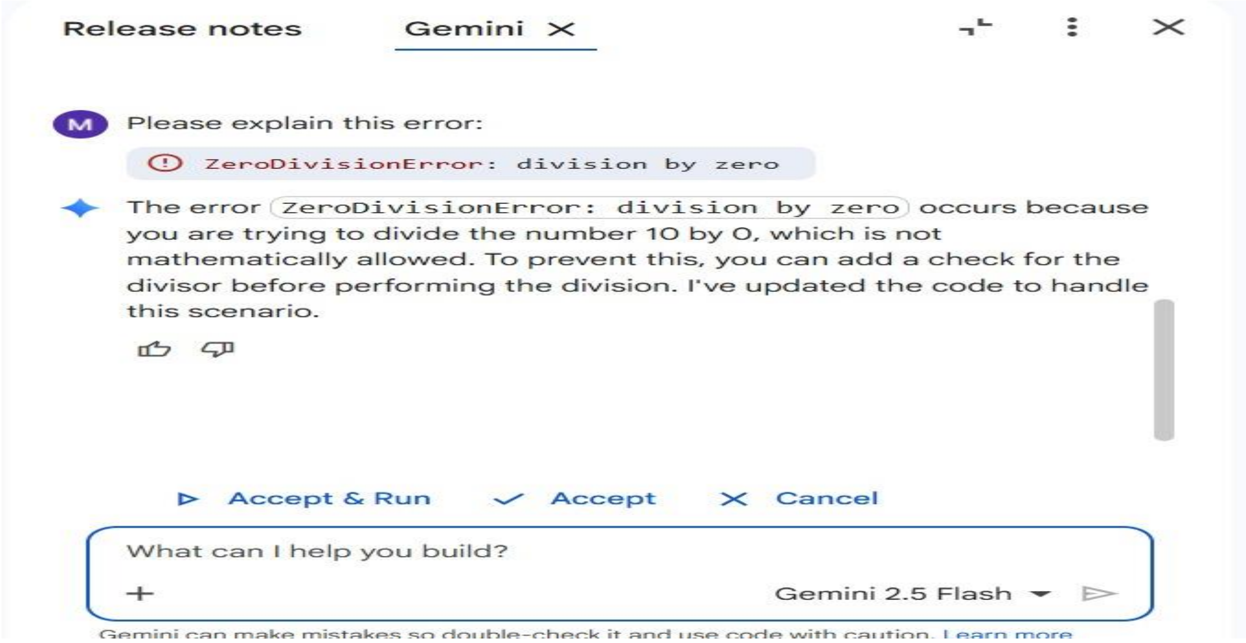
```
def divide(a,b):
  return a/b
print(divide(10,0))
```

```
---------------------------------------------------------------------------
ZeroDivisionError                         Traceback (most recent call last)
/tmp/ipython-input-3986490526.py in <cell line: 0>()
      1 def divide(a,b):
      2   return a/b
----> 3 print(divide(10,0))

/tmp/ipython-input-3986490526.py in divide(a, b)
      1 def divide(a,b):
----> 2   return a/b
      3 print(divide(10,0))

ZeroDivisionError: division by zero
```

Explanation of Error:



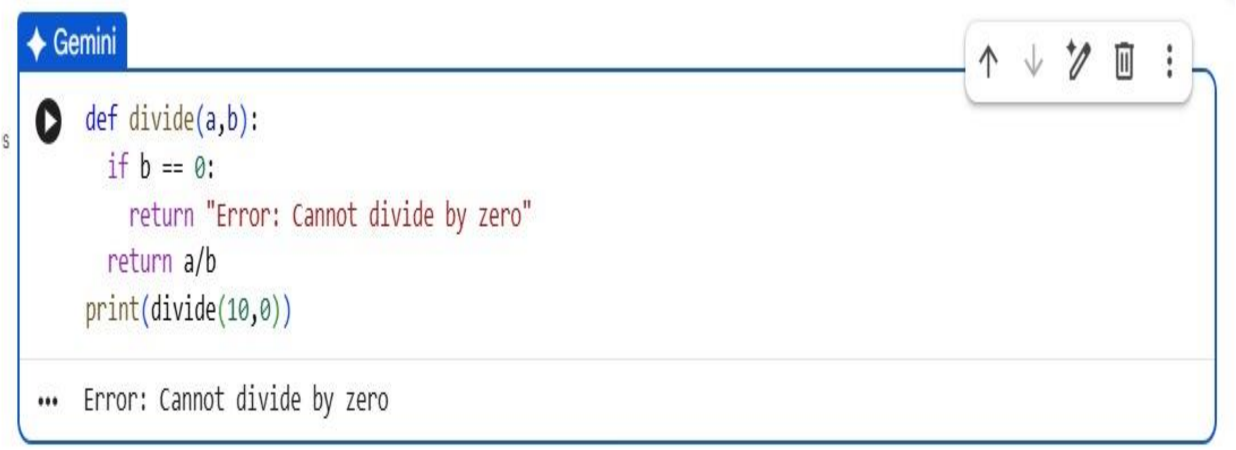
Please explain this error:

`ZeroDivisionError: division by zero`

The error `ZeroDivisionError: division by zero` occurs because you are trying to divide the number 10 by 0, which is not mathematically allowed. To prevent this, you can add a check for the divisor before performing the division. I've updated the code to handle this scenario.

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

Fixing Error:



```
def divide(a,b):
  if b == 0:
    return "Error: Cannot divide by zero"
  return a/b
print(divide(10,0))
```

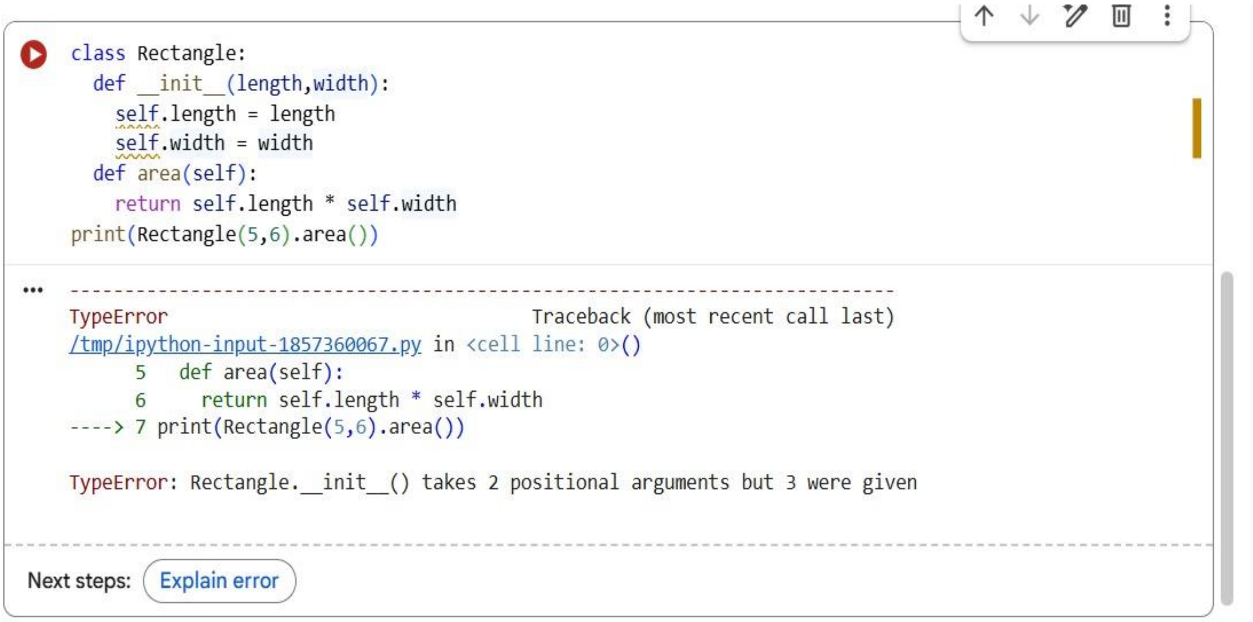
```
Error: Cannot divide by zero
```

EXPLANATION:

- A Python function is defined to perform division of two numbers without input validation.
- When the divisor value is zero, the function crashes during execution.
- Python raises a runtime error called ZeroDivisionError.
- The AI tool analyzes the error and identifies division by zero as the cause.
- A try-except block is added to handle the division operation safely.
- The try block performs the division, and the except block catches the runtime error.
- The function now executes without crashing and handles division by zero gracefully.

Task-04:Debugging Class Definition Errors

Identification of Error:

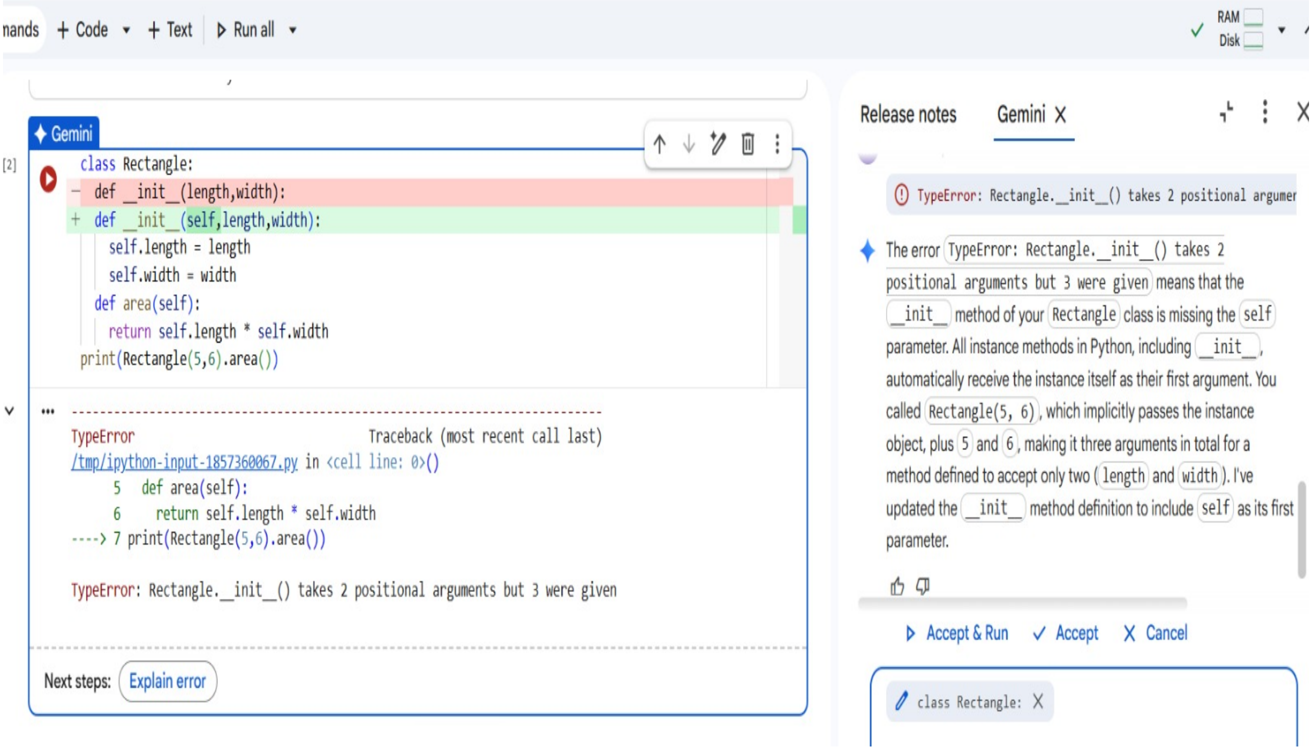


```
class Rectangle:
  def __init__(length,width):
    self.length = length
    self.width = width
  def area(self):
    return self.length * self.width
print(Rectangle(5,6).area())
```

```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
/tmp/ipython-input-1857360067.py in <cell line: 0>()
      5   def area(self):
      6     return self.length * self.width
----> 7 print(Rectangle(5,6).area())

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

Explanation of Error:



```
class Rectangle:
- def __init__(length,width):
+ def __init__(self,length,width):
    self.length = length
    self.width = width
  def area(self):
    return self.length * self.width
print(Rectangle(5,6).area())
```

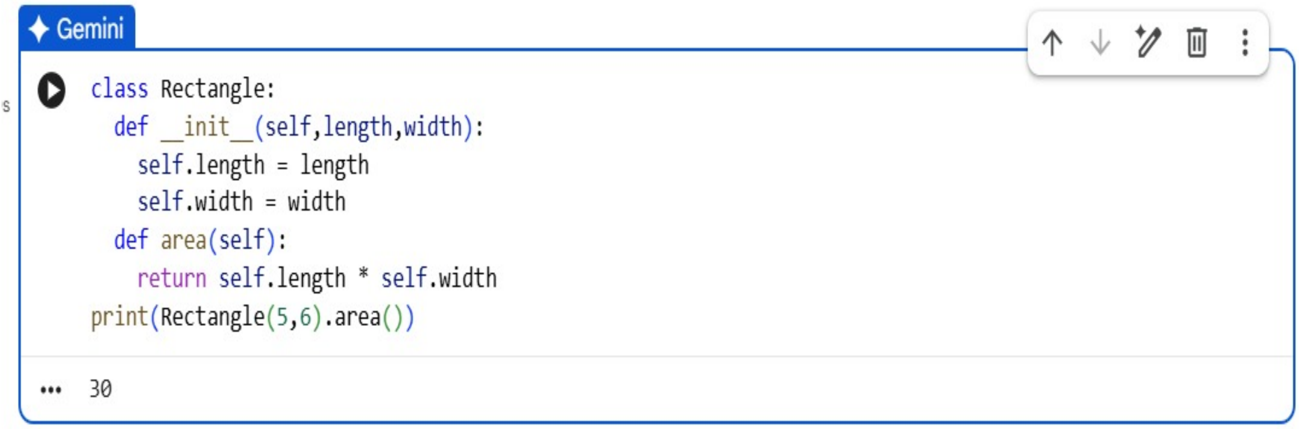
```
---------------------------------------------------------------------------
TypeError                                 Traceback (most recent call last)
/tmp/ipython-input-1857360067.py in <cell line: 0>()
      5   def area(self):
      6     return self.length * self.width
----> 7 print(Rectangle(5,6).area())

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

TypeError: Rectangle.__init__() takes 2 positional argumer

The error `TypeError: Rectangle.__init__() takes 2 positional arguments but 3 were given` means that the `__init__` method of your `Rectangle` class is missing the `self` parameter. All instance methods in Python, including `__init__`, automatically receive the instance itself as their first argument. You called `Rectangle(5, 6)`, which implicitly passes the instance object, plus `5` and `6`, making it three arguments in total for a method defined to accept only two (`length` and `width`). I've updated the `__init__` method definition to include `self` as its first parameter.

Fixing Error:



```
class Rectangle:
  def __init__(self,length,width):
    self.length = length
    self.width = width
  def area(self):
    return self.length * self.width
print(Rectangle(5,6).area())
```

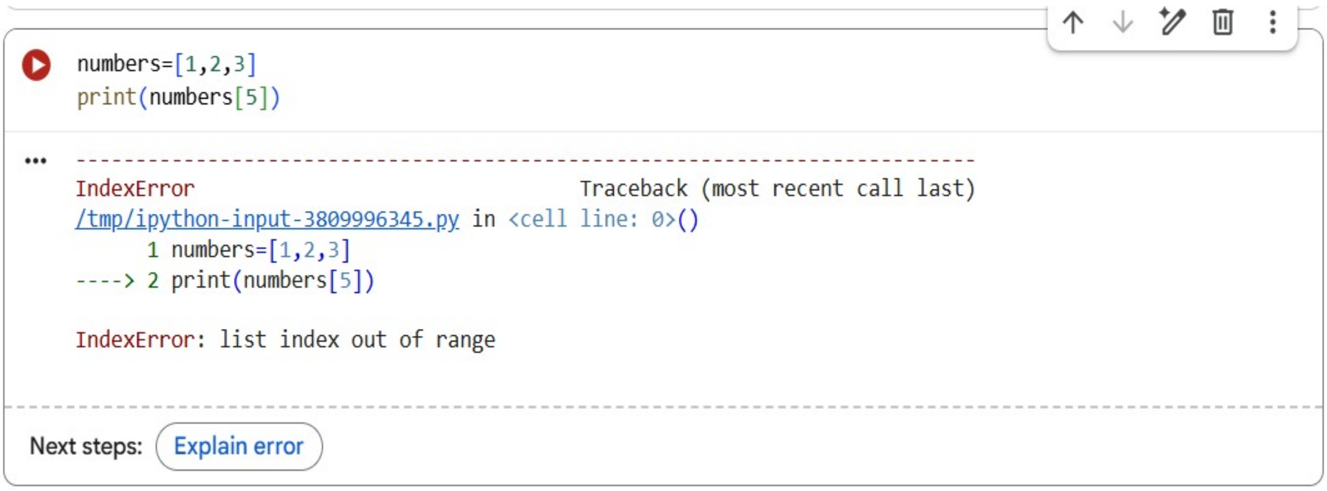
```
30
```

EXPLANATION:

- A Python class is defined with a constructor method __init__() that is missing the self parameter.
- When an object of the class is created, Python raises an error due to the incorrect constructor definition.
- The AI tool analyzes the class and identifies the missing self parameter as the issue.
- The constructor is corrected by adding self as the first parameter in the __init__() method.
- The self parameter allows instance variables to be associated with the current object.
- After correction, the class initializes objects properly.
- The corrected class follows object-oriented programming principles and works as expected.

Task-05:Resolving Index Errors in Lists

Identification of Error:

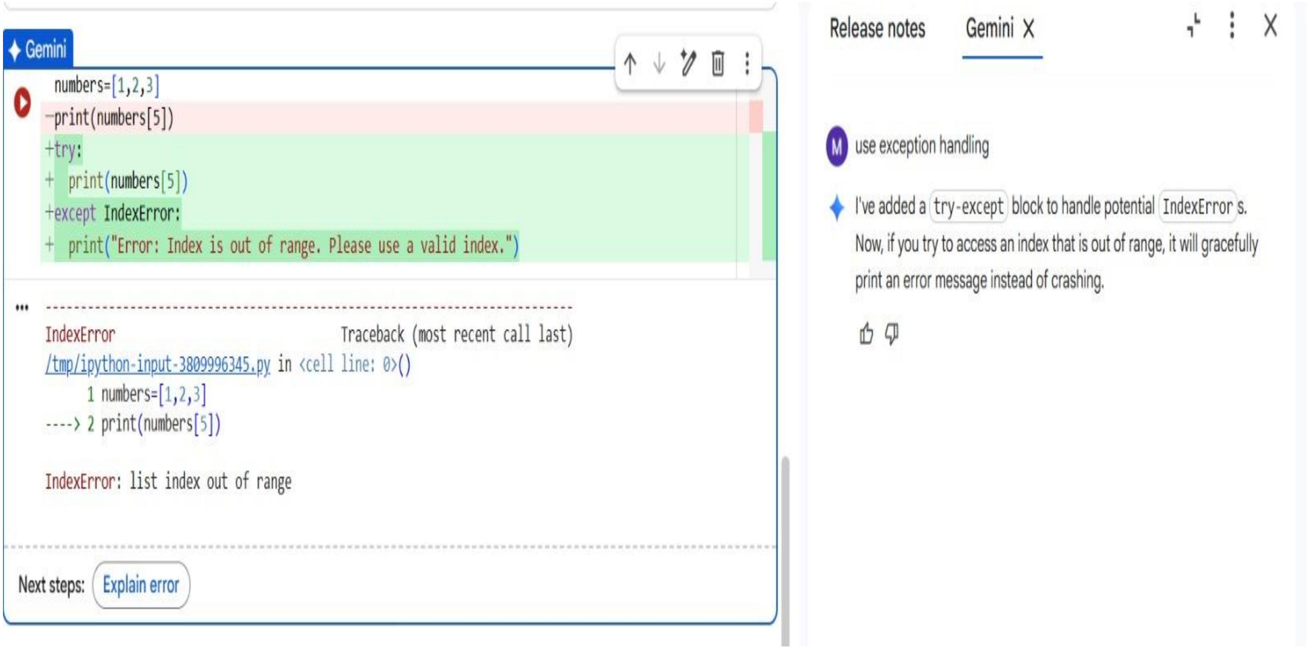


```
numbers=[1,2,3]
print(numbers[5])
```

```
---------------------------------------------------------------------------
IndexError                                Traceback (most recent call last)
/tmp/ipython-input-3809996345.py in <cell line: 0>()
      1 numbers=[1,2,3]
----> 2 print(numbers[5])

IndexError: list index out of range
```

Explanation of Error:



```
 numbers=[1,2,3]
-print(numbers[5])
+try:
+  print(numbers[5])
+except IndexError:
+  print("Error: Index is out of range. Please use a valid index.")
```

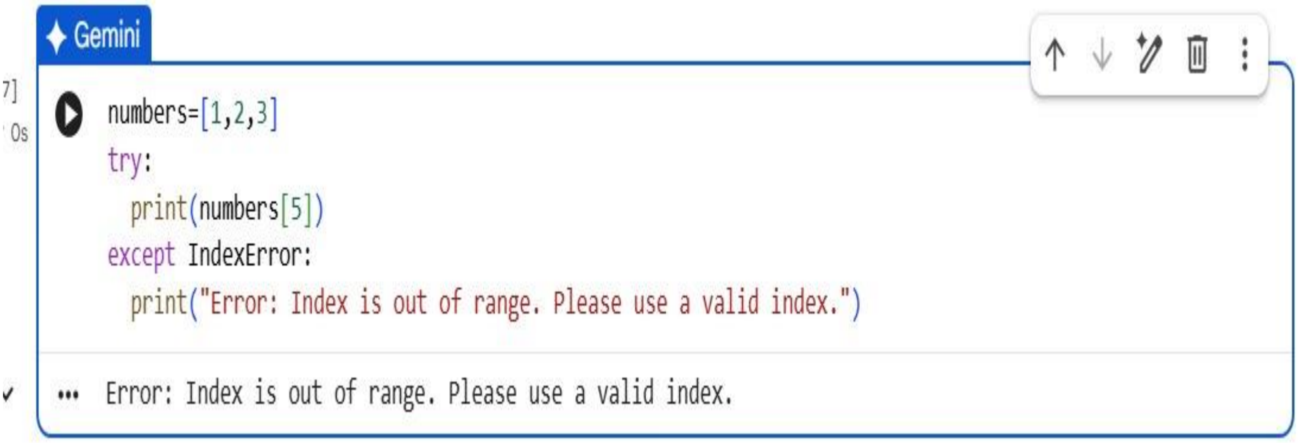
```
---------------------------------------------------------------------------
IndexError                                Traceback (most recent call last)
/tmp/ipython-input-3809996345.py in <cell line: 0>()
      1 numbers=[1,2,3]
----> 2 print(numbers[5])

IndexError: list index out of range
```

use exception handling

I've added a `try-except` block to handle potential `IndexError`s. Now, if you try to access an index that is out of range, it will gracefully print an error message instead of crashing.

Fixing Error:



```
numbers=[1,2,3]
try:
  print(numbers[5])
except IndexError:
  print("Error: Index is out of range. Please use a valid index.")
```

```
Error: Index is out of range. Please use a valid index.
```

EXPLANATION:

- A Python program attempts to access a list element using an index that is out of range.
- When the program is executed, Python raises an IndexError.
- The AI tool analyzes the code and identifies the invalid index access as the cause of the error.
- The AI suggests using safe access methods such as bounds checking or exception handling.
- Bounds checking ensures the index is within the valid range before accessing the list.
- Alternatively, a try-except block is used to catch the IndexError.
- After applying safe access logic, the program executes without crashing.
- The index error is successfully resolved, and list access becomes safe.