AI Assisted Coding

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Batch: 04

Task 1:

```
“””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

"""
"""
PROMPT:
Write a Python function that calculates the factorial of a number using recursion,
but intentionally include a logical or syntax error. Then, use Copilot or Cursor AI to
detect and fix the error in the function
"""

# Buggy factorial function (intentional error: missing base case for n==0)
def factorial_buggy(n):
    return n * factorial_buggy(n-1)

# Fixed factorial function
def factorial(n):
    if n == 0 or n == 1:
        return 1
    else:
        return n * factorial(n-1)

# Example usage
if __name__ == "__main__":
    print("Buggy factorial(5):")
    try:
        print(factorial_buggy(5))
    except RecursionError as e:
        print("Error:", e)
    print("Fixed factorial(5):", factorial(5))
```

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TASK 2

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"""

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.
"""
"""
PROMPT:
Prompt: Write a Python function that attempts to sort a
list containing both integers and strings, causing a type error.
Then, prompt AI to detect the issue and fix the code so that the list is sorted consistently.
"""
# Buggy sorting function (will fail with TypeError)
def sort_mixed_list_buggy(lst):
    return sorted(lst)

# Fixed sorting function: convert all elements to strings before sorting
def sort_mixed_list_fixed(lst):
    return sorted(lst, key=str)

# Example usage
if __name__ == "__main__":
    mixed = [3, "2", 1, "10", 5]
    print("Buggy sort:")
    try:
        print(sort_mixed_list_buggy(mixed))
    except TypeError as e:
        print("Error:", e)
    print("Fixed sort:", sort_mixed_list_fixed(mixed))
```

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TASK 3:

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"""
Task 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).
"""
"""
Prompt: Write a Python snippet for file handling that opens a file but forgets to close it. Then,
ask Copilot or Cursor AI
to improve the code using best practices, such as using a with open() block to ensure the file is
properly closed.
"""
# Buggy file handling (forgets to close the file)
def read_file_buggy(filename):
    f = open(filename, 'r')
    data = f.read()
    return data

# Fixed file handling using best practice (with open block)
def read_file_fixed(filename):
    with open(filename, 'r') as f:
        data = f.read()
    return data

# Example usage
if __name__ == "__main__":
    # Replace 'test.txt' with a valid filename to test
    try:
        print("Buggy file read:", read_file_buggy('test.txt'))
    except Exception as e:
        print("Error:", e)
    print("Fixed file read:", read_file_fixed('test.txt'))
```

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Task 4:

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"""
Task 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
"""
"""
Prompt:  Write a Python code snippet with a loop that causes a ZeroDivisionError (e.g., dividing by zero).
Then, ask AI to add error handling using try-except so the loop continues executing safely even when an error occurs.
"""
# Buggy code: ZeroDivisionError inside a loop
def zero_division_buggy():
    for i in range(-2, 3):
        print(10 / i)

# Fixed code: error handling with try-except
def zero_division_fixed():
    for i in range(-2, 3):
        try:
            print(10 / i)
        except ZeroDivisionError:
            print(f"Cannot divide by zero for i={i}")

# Example usage
if __name__ == "__main__":
    print("Buggy ZeroDivisionError loop:")
    try:
        zero_division_buggy()
    except ZeroDivisionError as e:
        print("Error:", e)
    print("Fixed ZeroDivisionError loop:")
    zero_division_fixed()
```

TASK 5:

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Task 5:
Include a buggy class definition with incorrect __init__
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parameters or attribute references. Ask AI to analyze and correct the constructor and attribute
usage.
"""
"""
Prompt: Write a Python class definition with a buggy init method, such as incorrect parameters or
wrong attribute references. Then, ask AI to analyze and correct the constructor and attribute usage
so the class works as intended.
"""
# Buggy class definition (incorrect __init__ parameters and attribute references)
class PersonBuggy:
    def __init__(self, name, age):
        self.nam = name  # Typo in attribute name
        self.agee = ag   # Typo in parameter and attribute name

# Fixed class definition
class Person:
    def __init__(self, name, age):
        self.name = name
        self.age = age

# Example usage
if __name__ == "__main__":
    print("Buggy Person class:")
    try:
        p = PersonBuggy("Alice", 30)
        print(p.name, p.age)
    except Exception as e:
        print("Error:", e)
    print("Fixed Person class:")
    p2 = Person("Bob", 25)
    print(p2.name, p2.age)
```

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