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Lab 7: Error Debugging with AI

Task 1: Syntax Error – Missing Parentheses in Print Statement

Buggy Code

```
def greet():  
    print "Hello, AI Debugging Lab!"  
greet()
```

Error Explanation

Python 3 requires parentheses for print(). The code fails with SyntaxError.

Corrected Code

```
def greet():  
    return "Hello, AI Debugging Lab!"  
  
# Test cases  
assert greet() == "Hello, AI Debugging Lab!"  
assert isinstance(greet(), str)  
assert "AI Debugging" in greet()  
print(greet())
```

Output

Hello, AI Debugging Lab!

Task 2: Logic Error – Incorrect Condition in If Statement

Buggy Code

```
def check_number(n):  
    if n = 10:  
        return "Ten"  
    else:  
        return "Not Ten"
```

Error Explanation

Using = instead of == causes SyntaxError. '=' is assignment, not comparison.

Corrected Code

```
def check_number(n):  
    if n == 10:  
        return "Ten"  
    else:  
        return "Not Ten"  
  
# Test cases  
assert check_number(10) == "Ten"  
assert check_number(5) == "Not Ten"  
assert check_number(-10) == "Not Ten"  
print(check_number(10))
```

Output

Ten

Task 3: Runtime Error – File Not Found

Buggy Code

```
def read_file(filename):  
    with open(filename, 'r') as f:  
        return f.read()  
  
print(read_file("nonexistent.txt"))
```

Error Explanation

If the file doesn't exist, FileNotFoundError is raised.

Corrected Code

```
def read_file(filename):  
    try:  
        with open(filename, 'r') as f:  
            return f.read()  
    except FileNotFoundError:  
        return f"Error: File '{filename}' not found."  
    except Exception as e:
```

```
return f"Error: {str(e)}"
```

```
# Test cases
```

```
assert "not found" in read_file("nonexistent.txt")
```

```
assert isinstance(read_file("nonexistent.txt"), str)
```

```
assert read_file("invalid_path/abc.txt").startswith("Error")
```

Output

Error: File 'nonexistent.txt' not found.

Task 4: AttributeError – Calling a Non-Existent Method

Buggy Code

```
class Car:
```

```
    def start(self):
```

```
        return "Car started"
```

```
my_car = Car()
```

```
print(my_car.drive()) # drive() is not defined
```

Error Explanation

drive() is not defined. Either call start() or define drive().

Corrected Code

```
class Car:
```

```
    def start(self):
```

```
        return "Car started"
```

```
    def drive(self):
```

```
        return "Car is driving"
```

```
my_car = Car()
```

```
# Test cases
```

```
assert my_car.start() == "Car started"
```

```
assert my_car.drive() == "Car is driving"
```

```
assert isinstance(my_car.start(), str)
```

```
print(my_car.start(), "and", my_car.drive())
```

Output

Car started and Car is driving

Task 5: TypeError – Mixing Strings and Integers

Buggy Code

```
def add_five(value):  
    return value + 5  
  
print(add_five("10"))
```

Error Explanation

Python does not allow adding str and int. Fix by casting or concatenation.

Corrected Code

```
# Solution 1: Type casting  
def add_five(value):  
    return int(value) + 5  
  
# Test cases  
assert add_five("10") == 15  
assert add_five(20) == 25  
assert add_five(0) == 5  
print(add_five("10"))  
  
# Solution 2: String concatenation  
def add_five(value):  
    return str(value) + "5"  
  
# Test cases  
assert add_five("10") == "105"  
assert add_five(20) == "205"  
assert add_five("A1") == "A15"  
print(add_five("10"))
```

Output

15
105