🎯 Task: Use two AI tools to find & fix problems in a broken Python code.

Original Broken Code (Before Fixing):

```
import numpy as np
import pandas as pd
import random

def generate_random_number(min_num, max_num):
    num = random.randint(min_num, max_num)
    print("Random number is: " + num)

def calc_average(num_list):
    total = sum(num_list)
    return total / lenght(num_list)

def check_prime(start, end):
    prime_list = []
for i in range(start, end):
    if i % 2 == 0:
        prime_list.append(i)
    return prime_list
def load_data(filepath):
    data = pd.read_csv(filepath)
    return data
def main():
```

```
    num_list = [10, 20, 30, "forty", 50]
print("The average is: ", calc_average(num_list))
    print("Prime numbers: ", check_prime(1, 10))

    file_path = "data.csv"
    data = load_data(file_path)
    print("Data loaded: ", data)

    random_num = generate_random_number(1, 100)
    print("Generated Random Number: ", random_num)

    try:
print("Result of division: ", 10 / 0)
    except ZeroDivisionError:
        print("Can't divide by zero")

    numbers = [x for x in range(100) if x % 3 == 0 and x % 5 == 0]
    print("Numbers divisible by 3 and 5 are: ", numbers)

    undefined_function_call()

main()
```

Issues Identified by AI Tools:

Here are the errors and suggestions provided by AI tools:

Syntax Errors:

1. "Random number is: " + num - TypeError: Cannot concatenate a string with an integer.
2. lenght(num_list) - Typo in length.
3. undefined_function_call() - This function is not defined.

Logic Errors:

1. check_prime() incorrectly identifies even numbers as primes.
2. num_list in calc_average includes a string ("forty"), which cannot be summed.
3. generate_random_number() does not return the generated random number.
4. The program does not check if the CSV file (data.csv) exists.

Suggestions for Improvement:

- Fix syntax errors and typos.
- Add proper error handling for file loading.
- Update check_prime() to identify prime numbers correctly.
- Add type validation to handle invalid inputs in num_list.

AI TOOLS USED:

- ***ChatGPT***
- ***Perplexlity.ai***
- ***Gemini***

Fixed Code (After Applying AI Suggestions):

```
import numpy as np
import pandas as pd
import random


def generate_random_number(min_num, max_num):
    num = random.randint(min_num, max_num)
    print("Random number is:", num)
return num
def calc_average(num_list):
    # Remove non-numeric values from the list
    num_list = [num for num in num_list if isinstance(num, (int, float))]
    total = sum(num_list)
    return total / len(num_list)
def check_prime(start, end):
    prime_list = []
    for i in range(start, end):
if i > 1:  # Prime numbers are greater than 1
            for j in range(2, int(i**0.5) + 1):
                if i % j == 0:
break
            else:
                prime_list.append(i)
    return prime_list
```

```
def load_data(filepath):
    try:
        data = pd.read_csv(filepath)
return data
    except FileNotFoundError:
        print(f"Error: File '{filepath}' not found.")
        return None
def main():
    num_list = [10, 20, 30, "forty", 50]
    print("The average is:", calc_average(num_list))
    print("Prime numbers:", check_prime(1, 10))
file_path = "data.csv"
    data = load_data(file_path)
    if data is not None:
        print("Data loaded:
", data)

    random_num = generate_random_number(1, 100)
    print("Generated Random Number:", random_num)

    try:
        print("Result of division:", 10 / 0)
except ZeroDivisionError:
        print("Can't divide by zero")

    numbers = [x for x in range(100) if x % 3 == 0 and x % 5 == 0]
```

```
    print("Numbers divisible by 3 and 5 are:", numbers)

    # Commenting undefined function to avoid runtime error
    # undefined_function_call()

main()
```

Key Fixes Applied:

1. Fixed TypeError in generate_random_number() by converting the integer to a string for printing and returning the number.
2. Corrected the typo in lenght() to len().
3. Added filtering of non-numeric values in calc_average() to avoid summing invalid data.
4. Updated check_prime() logic to properly identify prime numbers.
5. Added error handling for file loading in load_data().
6. Removed the call to the undefined function (undefined_function_call()).

Before & After Performance Comparison:

Broken Code Output (Before Fixing):

The broken code results in:

1. TypeError for concatenating a string with an integer.
2. NameError due to lenght() typo.
3. Logic errors in check_prime() returning even numbers as primes.
4. ValueError for non-numeric data in calc_average().
5. FileNotFoundError if data.csv does not exist.

Fixed Code Output (After Fixing):

1. Random number is correctly generated and returned:

Random number is: 42

2. Proper handling of non-numeric values in the list:

The average is: 27.5

3. Correct prime number logic:

Prime numbers: [2, 3, 5, 7]

4. File loading gracefully handles missing files:

Error: File 'data.csv' not found.

5. Division by zero handled with a clear message:

Can't divide by zero

6. Generates a list of numbers divisible by 3 and 5:

Numbers divisible by 3 and 5 are: [0, 15, 30, 45, 60, 75, 90]

Conclusion:

- The fixed code resolves all syntax, logic, and runtime issues.
- It provides accurate and error-free results for all functions.