Class Exercise:

Exception v1

Let's level up the calculator application you developed earlier. In addition to performing basic mathematical operations, the calculator should now support advanced calculations involving exponentiation and square root. However, you need to handle multiple types of exceptions that may occur during these calculations.

The Calculator class should have the following methods:

1. **add(x, y):** This method should take two numbers, x and y, as input and return their sum.
2. **subtract(x, y):** This method should take two numbers, x and y, as input and return the result of subtracting y from x.
3. **multiply(x, y):** This method should take two numbers, x and y, as input and return their product.
4. **divide(x, y):** This method should take two numbers, x and y, as input and return the result of dividing x by y. Handle the ZeroDivisionError exception if y is zero and return a meaningful error message.
5. **exponentiation(x, y):** This method should take two numbers, x and y, as input and return the result of raising x to the power of y. Handle the TypeError exception if either x or y is not a valid number and return a meaningful error message.
6. **square\_root(x):** This method should take a number x as input and return the square root of x. Handle the ValueError exception if x is negative and return a meaningful error message.

import math

class Calculator:

    def add(self, x, y):

# Your code here

    def subtract(self, x, y):

# Your code here

    def multiply(self, x, y):

# Your code here

    def divide(self, x, y):

# Your code here

    def exponentiation(self, x, y):

# Your code here

    def square\_root(self, x):

# Your code here

# Test the Calculator class

calculator = Calculator()

# Your code here

Expected output:

You can open the "receipt.txt" file using Python and print its contents to see the output. Here's an example of how you can do that:

8

6

12

5.0

Error: Division by zero is not allowed.

8

Error: Invalid input. Both x and y must be valid numbers.

4.0

Error: Invalid input. Cannot calculate the square root of a negative number.