Python Assignment: Exploring Key Modules - os, sys, math, csv

Objective:

The goal of this assignment is to familiarize students with some essential Python modules: os, sys, math, and csv. By completing the tasks, students will understand how to interact with the operating system, manage system-level tasks, perform mathematical operations, and handle CSV files in Python.

# Assignment Questions:

## Question 1: File Operations Using os Module

Write a Python program that:  
1. Creates a new directory named `Python\_Projects` in your current working directory (use the `os` module).  
2. Inside the `Python\_Projects` directory, create a new text file named `my\_file.txt` and write the text "Hello, this is your first file operation!" into it.  
3. Rename the file to `renamed\_file.txt`.  
4. List all the files and directories present in the `Python\_Projects` directory.  
  
Hint:  
- Use `os.mkdir()` to create a directory.  
- Use `os.rename()` to rename files.  
- Use `os.listdir()` to list all files and directories.

Example Output:  
Directory 'Python\_Projects' created successfully.  
File 'my\_file.txt' created and renamed to 'renamed\_file.txt'.  
Files and directories in 'Python\_Projects': ['renamed\_file.txt']

## Question 2: Command-line Arguments Using sys Module

Write a Python script that:  
1. Accepts two integers as command-line arguments.  
2. Prints the sum, difference, product, and quotient of the two integers.  
  
Hint:  
- Use `sys.argv` to retrieve command-line arguments. Don’t forget to convert them to integers using `int()`.  
- Handle division by zero using a try-except block.

Example Usage:  
$ python arithmetic.py 10 5  
  
Example Output:  
Sum: 15  
Difference: 5  
Product: 50  
Quotient: 2.0

## Question 3: Math Operations and CSV Handling

Write a Python program that:  
1. Creates a CSV file named `numbers.csv` that contains two columns: `number` and `square\_root`.  
2. Populate the CSV file with numbers from 1 to 20, where each row contains a number and its square root (use the `math.sqrt()` function).  
3. After writing to the CSV file, read the file and print its contents.  
  
Hint:  
- Use the `csv` module to write and read CSV files.  
- Use the `math.sqrt()` function from the `math` module to calculate the square root of numbers.

Example Output:  
1, 1.0  
2, 1.4142135623730951  
3, 1.7320508075688772  
...  
20, 4.47213595499958

## Submission Instructions:

Complete the three Python scripts for the questions above.  
Ensure the programs run without errors and produce the expected outputs.  
Submit your scripts as `.py` files or within a `.zip` file.  
  
Good luck, and have fun coding!