Create a cough detection system to count the number of coughs

**Background:** One of our partner company is developing a connected embedded system for COVID-19 treatment. The specific part of the system we are developing is to detect when a patient getting treated for COVID-19 coughs and count the number of coughs over a timeframe to automatically determine and alert.

**Dataset:** The dataset is the amplitude data sampled for 1 minute, with different count of coughs measured manually.

**Task:**

1. Perform an exploratory data analysis on the data and summarise the findings.
2. Clean-up the data and perform noise removal to isolate the cough signals.
3. Create a system to detect the cough and count the number of coughs.
   1. Label the data where cough is found
   2. Create an algorithm to detect the cough (1. using simple logic (can also be used for labelling), 2. Using machine learning
   3. Count the number of detected coughs
4. Present the code with a detailed explanation on the approach.

**More Details:**

The excel file has multiple sheets, each indicated with the number of coughs. The first column represents the amplitude data captured for 1 minute per sheet.