new-data

March 25, 2025

```python
[1]: import numpy as np
     import pandas as pd
     from scipy.stats import entropy
     from scipy.signal import welch
     import pywt

     ############################################################################
     # 1. Extract Only Robust Features
     ############################################################################
     def extract_robust_features(x, dt):
         """
         Extract only the robust features:
             1. Signal_Length
             2. Non_Zero_Count
             3. TKEO_Mean
             4. TKEO_Median
             5. PSD_Median
             6. PSD_Mean
             7. Sign_Changes
             8. Zero_Crossing_Rate
         """
         features = {}
         n = len(x)

         # 1. Signal Length
         features['Signal_Length'] = n

         # 2. Non-Zero Count
         features['Non_Zero_Count'] = np.count_nonzero(x)

         # 3. TKEO Mean
         tkeo = x[1:-1]**2 - x[:-2] * x[2:]
         features['TKEO_Mean'] = np.mean(tkeo) if len(tkeo) > 0 else np.nan

         # 4. TKEO Median
         features['TKEO_Median'] = np.median(tkeo) if len(tkeo) > 0 else np.nan
```

```python
    # 5-6. PSD Median and Mean
    freqs_welch, psd_vals = welch(x, fs=1 / dt)
    features['PSD_Median'] = np.median(psd_vals)
    features['PSD_Mean'] = np.mean(psd_vals)

    # 7. Sign Changes
    sign_changes = np.sum((x[:-1] * x[1:]) < 0)
    features['Sign_Changes'] = sign_changes

    # 8. Zero Crossing Rate
    features['Zero_Crossing_Rate'] = sign_changes / n

    return features


###############################################################################
# 2. Prepare Dataset with Segments
###############################################################################
def prepare_dataset(data, segment_size, dt):
    """
    Divide the signal into segments and extract robust features for each␣
 ↪segment.
    Returns:
      X: Features (num_segments, num_floors * num_features)
      y: Labels (noise factor or other target variable)
    """
    feature_cols = [f'Feature{i}' for i in range(1, 13)]  # 12 floors/sensors
    num_floors = len(feature_cols)
    num_features_per_floor = 8  # 8 robust features per floor
    dataset = []
    labels = []

    for start in range(0, len(data) - segment_size + 1, segment_size):
        segment_features = []

        for col in feature_cols:
            signal = data[col].values[start:start + segment_size]
            feat = extract_robust_features(signal, dt)
            segment_features.extend(list(feat.values()))

        dataset.append(segment_features)
        labels.append(data['NoiseFactor'].iloc[start])  # Use noise factor as␣
 ↪label

    df_dataset = pd.DataFrame(dataset)
    df_labels = pd.Series(labels, name='NoiseFactor')
    return df_dataset, df_labels
```

```python
###############################################################################
# 3. Generate Synthetic Data
###############################################################################
if __name__ == "__main__":
    # Parameters
    n_rows = 100000  # Number of data points
    time = np.linspace(0, 1000, n_rows)  # Time vector
    dt = time[1] - time[0]  # Sampling interval
    segment_size = 256  # Segment size
    noise_levels = np.linspace(0.01, 0.30, 5)  # Noise levels
    freqs = [1, 0.5, 2, 0.2, 1.5, 0.8, 1.2, 0.3, 0.7, 1.8, 1.1, 0.9]  #␣
↪Frequencies for 12 sensors

    # Initialize data dictionary
    data_dict = {'Time': time}

    # Generate signals for 12 sensors with noise
    for i in range(1, 13):
        clean_signal = np.sin(2 * np.pi * freqs[i-1] * time)  # Clean sine wave
        noisy_signal = clean_signal + np.random.normal(0, noise_levels[i % 5] *␣
↪np.std(clean_signal), size=n_rows)
        data_dict[f'Feature{i}'] = noisy_signal

    # Add noise factor column (target variable)
    data_dict['NoiseFactor'] = np.tile(noise_levels, n_rows //␣
↪len(noise_levels))

    # Convert to DataFrame
    combined_data = pd.DataFrame(data_dict)

    # Prepare dataset
    X, y = prepare_dataset(combined_data, segment_size, dt)

    # Print results
    print("Extracted Features (each row corresponds to a segment):")
    print(X.head())
    print("\nShape of extracted features DataFrame:", X.shape)
    print("Shape of labels Series:", y.shape)
```

```
Extracted Features (each row corresponds to a segment):
     0    1         2         3         4         5  6          7    8    9  \
0  256  256  0.007894  0.005267  0.000052  0.010113  5  0.019531  256  256
1  256  256  0.007423  0.008241  0.000053  0.010169  5  0.019531  256  256
2  256  256  0.008030  0.003078  0.000048  0.010132  7  0.027344  256  256
3  256  256  0.007128  0.006540  0.000063  0.010061  9  0.035156  256  256
4  256  256  0.006583  0.007359  0.000053  0.009876  9  0.035156  256  256
```

```
       …    86          87    88   89          90          91          92          93    94  \
0      …     8   0.031250   256  256   0.015204   0.015316   0.000177   0.009696   13
1      …     8   0.031250   256  256   0.015784   0.008433   0.000200   0.009884   15
2      …    11   0.042969   256  256   0.013678   0.009586   0.000143   0.010159    6
3      …     6   0.023438   256  256   0.015916   0.007206   0.000220   0.010087   13
4      …     6   0.023438   256  256   0.014729   0.009617   0.000180   0.009480   14

         95
0  0.050781
1  0.058594
2  0.023438
3  0.050781
4  0.054688

[5 rows x 96 columns]

Shape of extracted features DataFrame: (390, 96)
Shape of labels Series: (390,)
```

```python
import numpy as np
import pandas as pd
from scipy.stats import entropy
from scipy.signal import welch
import pywt


###############################################################################
# 1. Map Noise Factor to Label
###############################################################################
def noise_factor_to_label(nf):
    """
    Given a noise factor (float), return an integer label:
      5%  -> 1
      10% -> 2
      15% -> 3
      20% -> 4
      25% -> 5
      30% -> 6

    If nf is something else, return 0 or handle as needed.
    """
    # Use a small tolerance if floating values are not exact
    # E.g., if you have 0.050000001 or 0.0499999, etc.
    if np.isclose(nf, 0.05, atol=1e-4):
        return 1
    elif np.isclose(nf, 0.10, atol=1e-4):
        return 2
    elif np.isclose(nf, 0.15, atol=1e-4):
```

```python
            return 3
        elif np.isclose(nf, 0.20, atol=1e-4):
            return 4
        elif np.isclose(nf, 0.25, atol=1e-4):
            return 5
        elif np.isclose(nf, 0.30, atol=1e-4):
            return 6
        else:
            return 0   # or handle differently if needed


###############################################################################
# 2. Extract Only Robust Features
###############################################################################
def extract_robust_features(x, dt):
    """
    Extract only the robust features:
        1. Signal_Length
        2. Non_Zero_Count
        3. TKEO_Mean
        4. TKEO_Median
        5. PSD_Median
        6. PSD_Mean
        7. Sign_Changes
        8. Zero_Crossing_Rate
    """
    features = {}
    n = len(x)

    # 1. Signal Length
    features['Signal_Length'] = n

    # 2. Non-Zero Count
    features['Non_Zero_Count'] = np.count_nonzero(x)

    # 3. TKEO Mean
    tkeo = x[1:-1]**2 - x[:-2] * x[2:]
    features['TKEO_Mean'] = np.mean(tkeo) if len(tkeo) > 0 else np.nan

    # 4. TKEO Median
    features['TKEO_Median'] = np.median(tkeo) if len(tkeo) > 0 else np.nan

    # 5-6. PSD Median and Mean
    freqs_welch, psd_vals = welch(x, fs=1 / dt)
    features['PSD_Median'] = np.median(psd_vals)
    features['PSD_Mean'] = np.mean(psd_vals)

    # 7. Sign Changes
```

```python
        sign_changes = np.sum((x[:-1] * x[1:]) < 0)
        features['Sign_Changes'] = sign_changes

        # 8. Zero Crossing Rate
        features['Zero_Crossing_Rate'] = sign_changes / n

        return features


###############################################################################
# 3. Prepare Dataset with Segments
###############################################################################
def prepare_dataset(data, segment_size, dt):
    """
    Divide the signal into segments and extract robust features for each␣
 ↪segment.
    Returns:
      X: Features (num_segments, num_floors * num_features)
      y: Labels (mapped from NoiseFactor -> 1..6)
    """
    feature_cols = [f'Feature{i}' for i in range(1, 13)]  # 12 floors/sensors
    num_floors = len(feature_cols)
    num_features_per_floor = 8  # 8 robust features per floor
    dataset = []
    labels = []

    for start in range(0, len(data) - segment_size + 1, segment_size):
        segment_features = []

        for col in feature_cols:
            signal = data[col].values[start:start + segment_size]
            feat = extract_robust_features(signal, dt)
            segment_features.extend(list(feat.values()))

        # Convert the noise factor to a discrete label
        nf = data['NoiseFactor'].iloc[start]
        lbl = noise_factor_to_label(nf)

        dataset.append(segment_features)
        labels.append(lbl)

    df_dataset = pd.DataFrame(dataset)
    df_labels = pd.Series(labels, name='Label')
    return df_dataset, df_labels


###############################################################################
# 4. Generate Synthetic Data
###############################################################################
```

```python
if __name__ == "__main__":
    # Parameters
    n_rows = 100000  # Number of data points
    time = np.linspace(0, 1000, n_rows)  # Time vector
    dt = time[1] - time[0]  # Sampling interval
    segment_size = 256  # Segment size
    # Suppose these are your 6 discrete noise factors
    noise_levels = [0.05, 0.10, 0.15, 0.20, 0.25, 0.30]
    freqs = [1, 0.5, 2, 0.2, 1.5, 0.8, 1.2, 0.3, 0.7, 1.8, 1.1, 0.9]  #␣
↪Frequencies for 12 sensors

    # Initialize data dictionary
    data_dict = {'Time': time}

    # Generate signals for 12 sensors with noise
    # We'll just pick one noise factor for each sensor in a naive way for␣
↪demonstration
    # In practice, you might have 6 sensors repeated or you tile noise_levels,␣
↪etc.
    for i in range(1, 13):
        clean_signal = np.sin(2 * np.pi * freqs[i-1] * time)  # Clean sine wave
        # Just for demonstration, pick a noise factor from the 6
        nf = noise_levels[i % len(noise_levels)]
        noisy_signal = clean_signal + np.random.normal(0, nf * np.
↪std(clean_signal), size=n_rows)
        data_dict[f'Feature{i}'] = noisy_signal

    # Add noise factor column
    # For demonstration, we just tile the 6 levels across the dataset
    # so the first ~16k points are 0.05, next ~16k are 0.10, etc.
    # Adjust to match your real data structure
    repeats_per_level = n_rows // len(noise_levels)
    tiled_factors = []
    for lvl in noise_levels:
        tiled_factors.extend([lvl] * repeats_per_level)
    # If there's leftover for rounding, just fill them with the last level
    if len(tiled_factors) < n_rows:
        tiled_factors.extend([noise_levels[-1]] * (n_rows - len(tiled_factors)))

    data_dict['NoiseFactor'] = tiled_factors[:n_rows]

    # Convert to DataFrame
    combined_data = pd.DataFrame(data_dict)

    # Prepare dataset
    X, y = prepare_dataset(combined_data, segment_size, dt)
```

```
# Print results
print("Extracted Features (each row corresponds to a segment):")
print(X.head())
print("\nShape of extracted features DataFrame:", X.shape)
print("Shape of labels Series:", y.shape)
print("\nUnique labels:", sorted(y.unique()))
print("First 10 labels:", y[:290].tolist())
```

Extracted Features (each row corresponds to a segment):
```
     0    1         2         3         4         5   6          7    8    9  \
0  256  256  0.008733  0.005145  0.000063  0.010297  10   0.039062  256  256
1  256  256  0.008702  0.005971  0.000071  0.010030   7   0.027344  256  256
2  256  256  0.009468  0.005348  0.000076  0.010083   5   0.019531  256  256
3  256  256  0.009544  0.005325  0.000085  0.010234  11   0.042969  256  256
4  256  256  0.008177  0.007628  0.000058  0.010194   5   0.019531  256  256

   …  86        87   88   89        90        91        92        93  94  \
0  …  24  0.093750  256  256  0.004577  0.006444  0.000020  0.009985   7
1  …  20  0.078125  256  256  0.004550  0.005186  0.000017  0.009854   5
2  …  17  0.066406  256  256  0.004278  0.002300  0.000018  0.009832   4
3  …  14  0.054688  256  256  0.004460  0.004777  0.000025  0.009830   5
4  …  18  0.070312  256  256  0.004708  0.003816  0.000020  0.009810   5

         95
0  0.027344
1  0.019531
2  0.015625
3  0.019531
4  0.019531

[5 rows x 96 columns]

Shape of extracted features DataFrame: (390, 96)
Shape of labels Series: (390,)

Unique labels: [1, 2, 3, 4, 5, 6]
First 10 labels: [1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 2, 2, 2, 2, 2, 2, 2, 2, 2,
2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,
2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2, 2,
2, 2, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3,
3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3,
3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 3, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4,
4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4,
4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 4, 5, 5, 5,
5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5, 5]
```

```
[3]: import os

     ################################################################################
     # Directory Structure
     ################################################################################
     root_dir = "C:/Users/User/Desktop/happy/12floor_dam,undam/"

     # Damage levels and their corresponding labels
     damage_levels = [0.05, 0.10, 0.15, 0.20, 0.25, 0.30]
     label_map = {level: idx + 1 for idx, level in enumerate(damage_levels)}  # Map
      ↪damage levels to labels (1 to 6)

     ################################################################################
     # Confirm Labeling
     ################################################################################
     for floor_num in range(1, 13):  # Loop over floors 1 to 12
         floor_dir = os.path.join(root_dir, f"acc_{floor_num}_dam")

         print(f"\nFloor {floor_num}:")
         for damage_level in damage_levels:  # Loop over damage levels
             file_name = f"Acc{floor_num}_{damage_level}.txt"
             file_path = os.path.join(floor_dir, file_name)

             # Confirm the file exists and assign the label
             if os.path.exists(file_path):
                 label = label_map[damage_level]
                 print(f"File: {file_name}, Damage Level: {damage_level}, Label:
      ↪{label}")
             else:
                 print(f"File not found: {file_name}")
```

```
Floor 1:
File: Acc1_0.05.txt, Damage Level: 0.05, Label: 1
File: Acc1_0.1.txt, Damage Level: 0.1, Label: 2
File: Acc1_0.15.txt, Damage Level: 0.15, Label: 3
File: Acc1_0.2.txt, Damage Level: 0.2, Label: 4
File: Acc1_0.25.txt, Damage Level: 0.25, Label: 5
File: Acc1_0.3.txt, Damage Level: 0.3, Label: 6

Floor 2:
File: Acc2_0.05.txt, Damage Level: 0.05, Label: 1
File: Acc2_0.1.txt, Damage Level: 0.1, Label: 2
File: Acc2_0.15.txt, Damage Level: 0.15, Label: 3
File: Acc2_0.2.txt, Damage Level: 0.2, Label: 4
File: Acc2_0.25.txt, Damage Level: 0.25, Label: 5
File: Acc2_0.3.txt, Damage Level: 0.3, Label: 6
```

```
Floor 3:
File: Acc3_0.05.txt, Damage Level: 0.05, Label: 1
File: Acc3_0.1.txt, Damage Level: 0.1, Label: 2
File: Acc3_0.15.txt, Damage Level: 0.15, Label: 3
File: Acc3_0.2.txt, Damage Level: 0.2, Label: 4
File: Acc3_0.25.txt, Damage Level: 0.25, Label: 5
File: Acc3_0.3.txt, Damage Level: 0.3, Label: 6

Floor 4:
File: Acc4_0.05.txt, Damage Level: 0.05, Label: 1
File: Acc4_0.1.txt, Damage Level: 0.1, Label: 2
File: Acc4_0.15.txt, Damage Level: 0.15, Label: 3
File: Acc4_0.2.txt, Damage Level: 0.2, Label: 4
File: Acc4_0.25.txt, Damage Level: 0.25, Label: 5
File: Acc4_0.3.txt, Damage Level: 0.3, Label: 6

Floor 5:
File: Acc5_0.05.txt, Damage Level: 0.05, Label: 1
File: Acc5_0.1.txt, Damage Level: 0.1, Label: 2
File: Acc5_0.15.txt, Damage Level: 0.15, Label: 3
File: Acc5_0.2.txt, Damage Level: 0.2, Label: 4
File: Acc5_0.25.txt, Damage Level: 0.25, Label: 5
File: Acc5_0.3.txt, Damage Level: 0.3, Label: 6

Floor 6:
File: Acc6_0.05.txt, Damage Level: 0.05, Label: 1
File: Acc6_0.1.txt, Damage Level: 0.1, Label: 2
File: Acc6_0.15.txt, Damage Level: 0.15, Label: 3
File: Acc6_0.2.txt, Damage Level: 0.2, Label: 4
File: Acc6_0.25.txt, Damage Level: 0.25, Label: 5
File: Acc6_0.3.txt, Damage Level: 0.3, Label: 6

Floor 7:
File: Acc7_0.05.txt, Damage Level: 0.05, Label: 1
File: Acc7_0.1.txt, Damage Level: 0.1, Label: 2
File: Acc7_0.15.txt, Damage Level: 0.15, Label: 3
File: Acc7_0.2.txt, Damage Level: 0.2, Label: 4
File: Acc7_0.25.txt, Damage Level: 0.25, Label: 5
File: Acc7_0.3.txt, Damage Level: 0.3, Label: 6

Floor 8:
File: Acc8_0.05.txt, Damage Level: 0.05, Label: 1
File: Acc8_0.1.txt, Damage Level: 0.1, Label: 2
File: Acc8_0.15.txt, Damage Level: 0.15, Label: 3
File: Acc8_0.2.txt, Damage Level: 0.2, Label: 4
File: Acc8_0.25.txt, Damage Level: 0.25, Label: 5
File: Acc8_0.3.txt, Damage Level: 0.3, Label: 6
```

```
Floor 9:
File: Acc9_0.05.txt, Damage Level: 0.05, Label: 1
File: Acc9_0.1.txt, Damage Level: 0.1, Label: 2
File: Acc9_0.15.txt, Damage Level: 0.15, Label: 3
File: Acc9_0.2.txt, Damage Level: 0.2, Label: 4
File: Acc9_0.25.txt, Damage Level: 0.25, Label: 5
File: Acc9_0.3.txt, Damage Level: 0.3, Label: 6

Floor 10:
File: Acc10_0.05.txt, Damage Level: 0.05, Label: 1
File: Acc10_0.1.txt, Damage Level: 0.1, Label: 2
File: Acc10_0.15.txt, Damage Level: 0.15, Label: 3
File: Acc10_0.2.txt, Damage Level: 0.2, Label: 4
File: Acc10_0.25.txt, Damage Level: 0.25, Label: 5
File: Acc10_0.3.txt, Damage Level: 0.3, Label: 6

Floor 11:
File: Acc11_0.05.txt, Damage Level: 0.05, Label: 1
File: Acc11_0.1.txt, Damage Level: 0.1, Label: 2
File: Acc11_0.15.txt, Damage Level: 0.15, Label: 3
File: Acc11_0.2.txt, Damage Level: 0.2, Label: 4
File: Acc11_0.25.txt, Damage Level: 0.25, Label: 5
File: Acc11_0.3.txt, Damage Level: 0.3, Label: 6

Floor 12:
File: Acc12_0.05.txt, Damage Level: 0.05, Label: 1
File: Acc12_0.1.txt, Damage Level: 0.1, Label: 2
File: Acc12_0.15.txt, Damage Level: 0.15, Label: 3
File: Acc12_0.2.txt, Damage Level: 0.2, Label: 4
File: Acc12_0.25.txt, Damage Level: 0.25, Label: 5
File: Acc12_0.3.txt, Damage Level: 0.3, Label: 6
```

[29]:
```python
import pandas as pd

# List of file paths
file_paths = [
    "C:/Users/User/Desktop/happy/12floor_dam,undam/acc_12_dam/Acc12_0.05.txt",
    "C:/Users/User/Desktop/happy/12floor_dam,undam/acc_12_dam/Acc12_0.1.txt",
    "C:/Users/User/Desktop/happy/12floor_dam,undam/acc_12_dam/Acc12_0.15.txt",
    "C:/Users/User/Desktop/happy/12floor_dam,undam/acc_12_dam/Acc12_0.2.txt",
    "C:/Users/User/Desktop/happy/12floor_dam,undam/acc_12_dam/Acc12_0.25.txt",
    "C:/Users/User/Desktop/happy/12floor_dam,undam/acc_12_dam/Acc12_0.3.txt"
]

# Initialize an empty list to store DataFrames
data_frames = []
```

```python
# Iterate over files and assign labels based on file index
for label, file_path in enumerate(file_paths):
    # Load the file while selecting Time (column 0) and 12 features (columns
    ↪2-13)
    data = pd.read_csv(file_path, delim_whitespace=True, header=None,
    ↪usecols=[0] + list(range(2, 14)), nrows=100000)

    # Assign column names: Time + Feature1 to Feature12
    data.columns = ['Time'] + [f'Feature{i}' for i in range(1, 13)]

    # Assign label based on file index
    data['Damage'] = label

    # Append to list
    data_frames.append(data)

# Combine all files into a single DataFrame
combined_data = pd.concat(data_frames, ignore_index=True)

# Print shape and preview
print(combined_data.shape)  # Should be (6*25000, 14) = (150000, 14)
random_samples = combined_data.sample(n=5, random_state=42)
print(random_samples)
```

```
C:\Users\User\AppData\Local\Temp\ipykernel_4260\2809047512.py:19: FutureWarning:
The 'delim_whitespace' keyword in pd.read_csv is deprecated and will be removed
in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
C:\Users\User\AppData\Local\Temp\ipykernel_4260\2809047512.py:19: FutureWarning:
The 'delim_whitespace' keyword in pd.read_csv is deprecated and will be removed
in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
C:\Users\User\AppData\Local\Temp\ipykernel_4260\2809047512.py:19: FutureWarning:
The 'delim_whitespace' keyword in pd.read_csv is deprecated and will be removed
in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
C:\Users\User\AppData\Local\Temp\ipykernel_4260\2809047512.py:19: FutureWarning:
The 'delim_whitespace' keyword in pd.read_csv is deprecated and will be removed
in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
C:\Users\User\AppData\Local\Temp\ipykernel_4260\2809047512.py:19: FutureWarning:
The 'delim_whitespace' keyword in pd.read_csv is deprecated and will be removed
```

```
in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
C:\Users\User\AppData\Local\Temp\ipykernel_4260\2809047512.py:19: FutureWarning:
The 'delim_whitespace' keyword in pd.read_csv is deprecated and will be removed
in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

(600000, 14)
            Time  Feature1   Feature2   Feature3   Feature4   Feature5   Feature6  \
4242      21.215  0.299995   0.028560   0.852649   1.475890    1.32319   0.946200
60608    303.045 -0.718966  -1.548780  -1.156040  -0.489940   -0.53173  -0.722983
392832   464.165  0.898631   0.399405   0.657929   0.432073    1.00675   1.096680
41643    208.220 -0.874157  -0.700758  -0.805924  -1.444120   -2.05542  -1.087370
464234   321.175  0.844849   0.978465   0.455574   1.336800    1.18179   0.438657


          Feature7   Feature8   Feature9   Feature10  Feature11  Feature12  Damage
4242      0.991682   1.348940   1.062180    0.634827   0.590386   0.016732       0
60608    -0.105155  -0.600786  -1.190760   -0.197055   0.134325  -0.469881       0
392832    0.553895   1.314090   0.968477    0.701114   1.084340   0.878151       3
41643    -0.627510  -0.794099  -0.945895   -1.687840  -1.634270  -1.866140       0
464234    0.543331   0.617328   0.583380    0.286380   0.871279   1.979660       4
```

```python
import numpy as np
import pandas as pd
from scipy.stats import entropy
from scipy.signal import welch
import pywt


#############################################################################
# 1. Define Robust Feature Extraction Function
#############################################################################
def extract_robust_features(x, dt):
    """
    Extract 8 robust features from 1D signal x.
    """
    features = {}
    n = len(x)

    # 1. Signal Length
    features['Signal_Length'] = n

    # 2. Non-Zero Count
    features['Non_Zero_Count'] = np.count_nonzero(x)

    # 3. TKEO Mean
    tkeo = x[1:-1]**2 - x[:-2] * x[2:]
```

```python
    features['TKEO_Mean'] = np.mean(tkeo) if len(tkeo) > 0 else np.nan

    # 4. TKEO Median
    features['TKEO_Median'] = np.median(tkeo) if len(tkeo) > 0 else np.nan

    # 5-6. PSD Median and Mean
    freqs_welch, psd_vals = welch(x, fs=1 / dt)
    features['PSD_Median'] = np.median(psd_vals)
    features['PSD_Mean'] = np.mean(psd_vals)

    # 7. Sign Changes
    sign_changes = np.sum((x[:-1] * x[1:]) < 0)
    features['Sign_Changes'] = sign_changes

    # 8. Zero Crossing Rate
    features['Zero_Crossing_Rate'] = sign_changes / n

    return features

################################################################################
# 2. Process Files and Extract Features
################################################################################
file_paths = [
    "C:/Users/User/Desktop/happy/12floor_dam,undam/acc_12_dam/Acc12_0.05.txt",
    "C:/Users/User/Desktop/happy/12floor_dam,undam/acc_12_dam/Acc12_0.1.txt",
    "C:/Users/User/Desktop/happy/12floor_dam,undam/acc_12_dam/Acc12_0.15.txt",
    "C:/Users/User/Desktop/happy/12floor_dam,undam/acc_12_dam/Acc12_0.2.txt",
    "C:/Users/User/Desktop/happy/12floor_dam,undam/acc_12_dam/Acc12_0.25.txt",
    "C:/Users/User/Desktop/happy/12floor_dam,undam/acc_12_dam/Acc12_0.3.txt"
]

damage_levels = [0.05, 0.10, 0.15, 0.20, 0.25, 0.30]
label_map = {level: idx for idx, level in enumerate(damage_levels)}  # Map
 ↪damage levels to labels (0 to 5)

segment_size = 256
data_frames = []

for file_path in file_paths:
    # Load the file while selecting Time (column 0) and 12 features (columns
 ↪2-13)
    data = pd.read_csv(file_path, delim_whitespace=True, header=None,
 ↪usecols=[0] + list(range(2, 14)), nrows=100000)

    # Assign column names: Time + Feature1 to Feature12
    data.columns = ['Time'] + [f'Feature{i}' for i in range(1, 13)]
```

```python
    # Compute time step (constant sampling interval)
    dt = data['Time'].diff().iloc[1]

    # Extract the damage level from the file name
    damage_level_str = file_path.split('_')[-1].replace('.txt', '')  # Extract
↪"0.5", "1.0", etc.
    damage_level = float(damage_level_str)  # Convert to float
    label = label_map[damage_level]  # Map to label (0 to 5)

    # Extract features for each segment
    feature_list = []
    for start in range(0, len(data) - segment_size + 1, segment_size):
        segment_features = {}
        for col in data.columns[1:]:  # Skip 'Time'
            signal = data[col].values[start:start + segment_size]
            feat = extract_robust_features(signal, dt)
            for key, value in feat.items():
                segment_features[f"{col}_{key}"] = value
        segment_features['Damage'] = label  # Assign damage label
        feature_list.append(segment_features)

    # Convert to DataFrame and append to list
    df_features = pd.DataFrame(feature_list)
    data_frames.append(df_features)


################################################################################
# 3. Combine All DataFrames
################################################################################
combined_data = pd.concat(data_frames, ignore_index=True)


################################################################################
# 4. Print Shape and Preview
################################################################################
print("Combined Data Shape:", combined_data.shape)  # Should be (390*6, 96+1) =
↪(2340, 97)
random_samples = combined_data.sample(n=5, random_state=42)
print("\nRandom Samples:")
print(random_samples)
```

C:\Users\User\AppData\Local\Temp\ipykernel_4260\324107802.py:64: FutureWarning:
The 'delim_whitespace' keyword in pd.read_csv is deprecated and will be removed
in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
C:\Users\User\AppData\Local\Temp\ipykernel_4260\324107802.py:64: FutureWarning:
The 'delim_whitespace' keyword in pd.read_csv is deprecated and will be removed
in a future version. Use ``sep='\s+'`` instead

```
    data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
C:\Users\User\AppData\Local\Temp\ipykernel_4260\324107802.py:64: FutureWarning:
The 'delim_whitespace' keyword in pd.read_csv is deprecated and will be removed
in a future version. Use ``sep='\s+'`` instead
    data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
C:\Users\User\AppData\Local\Temp\ipykernel_4260\324107802.py:64: FutureWarning:
The 'delim_whitespace' keyword in pd.read_csv is deprecated and will be removed
in a future version. Use ``sep='\s+'`` instead
    data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
C:\Users\User\AppData\Local\Temp\ipykernel_4260\324107802.py:64: FutureWarning:
The 'delim_whitespace' keyword in pd.read_csv is deprecated and will be removed
in a future version. Use ``sep='\s+'`` instead
    data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
C:\Users\User\AppData\Local\Temp\ipykernel_4260\324107802.py:64: FutureWarning:
The 'delim_whitespace' keyword in pd.read_csv is deprecated and will be removed
in a future version. Use ``sep='\s+'`` instead
    data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Combined Data Shape: (2340, 97)

Random Samples:
      Feature1_Signal_Length  Feature1_Non_Zero_Count  Feature1_TKEO_Mean  \
218                      256                      256            0.313514
1825                     256                      256            0.249268
1840                     256                      256            0.324878
478                      256                      256            0.325979
1199                     256                      256            0.243134


      Feature1_TKEO_Median  Feature1_PSD_Median  Feature1_PSD_Mean  \
218               0.251378             0.002549           0.005062
1825              0.140261             0.001711           0.004105
1840              0.188408             0.002499           0.004905
478               0.180272             0.002382           0.004161
1199              0.168335             0.001477           0.004488


      Feature1_Sign_Changes  Feature1_Zero_Crossing_Rate  \
218                      92                     0.359375
1825                     74                     0.289062
1840                     91                     0.355469
478                     106                     0.414062
1199                     82                     0.320312


      Feature2_Signal_Length  Feature2_Non_Zero_Count  …  \
```

```
      218                    256                      256   …
     1825                    256                      256   …
     1840                    256                      256   …
      478                    256                      256   …
     1199                    256                      256   …

          Feature11_Zero_Crossing_Rate  Feature12_Signal_Length  \
      218                      0.285156                      256
     1825                      0.312500                      256
     1840                      0.277344                      256
      478                      0.289062                      256
     1199                      0.265625                      256

          Feature12_Non_Zero_Count  Feature12_TKEO_Mean  Feature12_TKEO_Median  \
      218                       256             0.270506               0.150373
     1825                       256             0.222556               0.180247
     1840                       256             0.302385               0.147281
      478                       256             0.300820               0.152929
     1199                       256             0.211739               0.110797

          Feature12_PSD_Median  Feature12_PSD_Mean  Feature12_Sign_Changes  \
      218              0.002377            0.006515                      67
     1825              0.001833            0.004105                      91
     1840              0.002358            0.007136                      86
      478              0.002493            0.007716                      79
     1199              0.001338            0.006208                      60

          Feature12_Zero_Crossing_Rate  Damage
      218                      0.261719       0
     1825                      0.355469       4
     1840                      0.335938       4
      478                      0.308594       1
     1199                      0.234375       3

     [5 rows x 97 columns]
```

```python
import numpy as np
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.ensemble import RandomForestClassifier, GradientBoostingClassifier
from sklearn.svm import SVC
from sklearn.linear_model import LogisticRegression, RidgeClassifier
from sklearn.metrics import (
    accuracy_score,
    classification_report,
    confusion_matrix,
```

```python
    ConfusionMatrixDisplay,
)
from sklearn.model_selection import GridSearchCV
import matplotlib.pyplot as plt


################################################################################
# 1. Prepare the Dataset
################################################################################
# Assuming X (96 features) and y (labels 1-6) are already defined
# Example:
# X = combined_data.drop(columns=['Damage'])
# y = combined_data['Damage']

# Normalize/Scale Features
scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)

# Train-Test Split (80-20)
X_train, X_test, y_train, y_test = train_test_split(
    X_scaled, y, test_size=0.2, random_state=42, stratify=y
)


################################################################################
# 2. Train and Evaluate Multiple Models with Regularization
################################################################################
def evaluate_model(model, X_train, X_test, y_train, y_test):
    """
    Train a model and evaluate its performance.
    """
    # Train the model
    model.fit(X_train, y_train)

    # Predictions
    y_pred = model.predict(X_test)

    # Evaluation Metrics
    accuracy = accuracy_score(y_test, y_pred)
    report = classification_report(y_test, y_pred, output_dict=True)
    cm = confusion_matrix(y_test, y_pred)

    return accuracy, report, cm

# Initialize Models with Regularization
models = {
    "Random Forest": RandomForestClassifier(
        random_state=42, max_depth=10, min_samples_split=5
    ),  # Regularization via depth and split constraints
```

```python
    "Gradient Boosting": GradientBoostingClassifier(
        random_state=42, max_depth=5, learning_rate=0.1
    ),  # Regularization via depth and learning rate
    "SVM (L2 Regularization)": SVC(
        kernel="linear", C=1.0, random_state=42
    ),  # L2 regularization via `C`
    "Logistic Regression (L2 Regularization)": LogisticRegression(
        penalty="l2", C=1.0, max_iter=1000, random_state=42
    ),  # L2 regularization via `C`
    "Ridge Classifier": RidgeClassifier(alpha=1.0, random_state=42),  # L2
 ↪regularization via `alpha`
}

# Evaluate Each Model
results = {}
for name, model in models.items():
    print(f"Training {name}...")
    accuracy, report, cm = evaluate_model(model, X_train, X_test, y_train,
 ↪y_test)
    results[name] = {"Accuracy": accuracy, "Report": report, "Confusion Matrix":
 ↪ cm}
    print(f"{name} Accuracy: {accuracy:.4f}")
    print("Classification Report:")
    print(pd.DataFrame(report).T)
    print("\n")


###############################################################################
# 3. Visualize Confusion Matrices
###############################################################################
fig, axes = plt.subplots(2, 3, figsize=(15, 10))
axes = axes.flatten()

for i, (name, result) in enumerate(results.items()):
    cm = result["Confusion Matrix"]
    disp = ConfusionMatrixDisplay(confusion_matrix=cm, display_labels=np.
 ↪unique(y))
    disp.plot(ax=axes[i], cmap="Blues", colorbar=False)
    axes[i].set_title(f"{name} Confusion Matrix")
    axes[i].grid(False)

plt.tight_layout()
plt.show()


###############################################################################
# 4. Hyperparameter Tuning with Regularization (Grid Search)
###############################################################################
# Example: Tune Logistic Regression
```

```python
param_grid_logreg = {
    "C": [0.1, 1.0, 10.0],  # Regularization strength (smaller C = stronger␣
  ↪regularization)
    "penalty": ["l2"],  # L2 regularization
    "solver": ["lbfgs"],  # Solver compatible with L2 penalty
}

grid_search_logreg = GridSearchCV(
    LogisticRegression(max_iter=1000, random_state=42),
    param_grid_logreg,
    cv=3,
    scoring="accuracy",
)
grid_search_logreg.fit(X_train, y_train)

print("Best Parameters for Logistic Regression:", grid_search_logreg.
  ↪best_params_)
print("Best Cross-Validation Accuracy:", grid_search_logreg.best_score_)

# Evaluate Best Model
best_logreg = grid_search_logreg.best_estimator_
y_pred_best_logreg = best_logreg.predict(X_test)
print("Test Accuracy with Best Logistic Regression Model:",␣
  ↪accuracy_score(y_test, y_pred_best_logreg))


##############################################################################
# 5. Feature Importance (for Tree-Based Models)
##############################################################################
# Plot Feature Importance for Random Forest
rf_model = models["Random Forest"]
feature_importances = rf_model.feature_importances_
sorted_indices = np.argsort(feature_importances)[::-1]

plt.figure(figsize=(12, 6))
plt.bar(range(len(feature_importances)), feature_importances[sorted_indices])
plt.xticks(range(len(feature_importances)), [f"Feature {i+1}" for i in␣
  ↪sorted_indices], rotation=90)
plt.title("Random Forest Feature Importance")
plt.xlabel("Features")
plt.ylabel("Importance Score")
plt.tight_layout()
plt.show()
```

```
Training Random Forest…
Random Forest Accuracy: 0.9893
Classification Report:
              precision    recall  f1-score     support
```

```
0           0.987342   1.000000   0.993631    78.000000
1           1.000000   0.974359   0.987013    78.000000
2           1.000000   0.974359   0.987013    78.000000
3           1.000000   1.000000   1.000000    79.000000
4           0.962963   1.000000   0.981132    78.000000
5           0.987179   0.987179   0.987179    78.000000
accuracy    0.989339   0.989339   0.989339     0.989339
macro avg   0.989581   0.989316   0.989328   469.000000
weighted avg 0.989603  0.989339   0.989351   469.000000


Training Gradient Boosting…
Gradient Boosting Accuracy: 0.9851
Classification Report:
            precision    recall  f1-score     support
0           1.000000   1.000000   1.000000    78.000000
1           0.987179   0.987179   0.987179    78.000000
2           1.000000   0.961538   0.980392    78.000000
3           0.974684   0.974684   0.974684    79.000000
4           0.962963   1.000000   0.981132    78.000000
5           0.987179   0.987179   0.987179    78.000000
accuracy    0.985075   0.985075   0.985075     0.985075
macro avg   0.985334   0.985097   0.985094   469.000000
weighted avg 0.985312  0.985075   0.985072   469.000000


Training SVM (L2 Regularization)…
```

```python
import numpy as np
import pandas as pd
import glob
import re
from scipy.signal import welch
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.ensemble import RandomForestClassifier, GradientBoostingClassifier
from sklearn.svm import SVC
from sklearn.linear_model import LogisticRegression, RidgeClassifier
from sklearn.metrics import accuracy_score, classification_report,␣
 ↪confusion_matrix, ConfusionMatrixDisplay
import matplotlib.pyplot as plt


###############################################################################
# 1. Define Robust Feature Extraction Function
###############################################################################
def extract_robust_features(x, dt):
    features = {}
```

```python
    n = len(x)
    # 1. Signal Length
    features['Signal_Length'] = n
    # 2. Non-Zero Count
    features['Non_Zero_Count'] = np.count_nonzero(x)
    # 3. TKEO Mean
    tkeo = x[1:-1]**2 - x[:-2] * x[2:]
    features['TKEO_Mean'] = np.mean(tkeo) if len(tkeo) > 0 else np.nan
    # 4. TKEO Median
    features['TKEO_Median'] = np.median(tkeo) if len(tkeo) > 0 else np.nan
    # 5-6. PSD Median and Mean
    freqs_welch, psd_vals = welch(x, fs=1 / dt)
    features['PSD_Median'] = np.median(psd_vals)
    features['PSD_Mean'] = np.mean(psd_vals)
    # 7. Sign Changes
    sign_changes = np.sum((x[:-1] * x[1:]) < 0)
    features['Sign_Changes'] = sign_changes
    # 8. Zero Crossing Rate
    features['Zero_Crossing_Rate'] = sign_changes / n
    return features


###############################################################################
# 2. Process Files and Extract Features
###############################################################################
# Automatically detect all files
file_paths = glob.glob("C:/Users/User/Desktop/happy/12floor_dam,undam/**/*.
 ↪txt", recursive=True)

# Use regex to extract numeric damage level and skip files that don't match the
 ↪expected format.
damage_levels = sorted(set(
    float(match.group(1))
    for fp in file_paths
    if (match := re.search(r'_(\d+\.?\d*)\.txt$', fp))
))

# Debug: print any file paths that do not match the expected pattern
for fp in file_paths:
    if not re.search(r'_(\d+\.?\d*)\.txt$', fp):
        print(f"Skipping file due to unexpected format: {fp}")

label_map = {level: idx for idx, level in enumerate(damage_levels)}

segment_size = 256
data_frames = []

for file_path in file_paths:
```

```python
    # Skip files that do not match the expected damage level format
    if not re.search(r'_(\d+\.?\d*)\.txt$', file_path):
        continue

    data = pd.read_csv(file_path, delim_whitespace=True, header=None,
 ↪usecols=[0] + list(range(2, 14)), nrows=100000)
    data.columns = ['Time'] + [f'Feature{i}' for i in range(1, 13)]
    dt = data['Time'].diff().iloc[1]

    damage_level = float(re.search(r'_(\d+\.?\d*)\.txt$', file_path).group(1))
    label = label_map[damage_level]

    feature_list = []
    for start in range(0, len(data) - segment_size + 1, segment_size):
        segment_features = {}
        for col in data.columns[1:]:
            signal = data[col].values[start:start + segment_size]
            feat = extract_robust_features(signal, dt)
            for key, value in feat.items():
                segment_features[f"{col}_{key}"] = value
        segment_features['Damage'] = label
        feature_list.append(segment_features)

    df_features = pd.DataFrame(feature_list)
    # Optional: print the column names for debugging consistency
    print(f"Processing {file_path} - Columns: {df_features.columns.tolist()}")
    data_frames.append(df_features)

combined_data = pd.concat(data_frames, ignore_index=True)


###############################################################################
# 3. Train and Evaluate Models
###############################################################################
X = combined_data.drop(columns=['Damage'])
y = combined_data['Damage']
scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)
X_train, X_test, y_train, y_test = train_test_split(X_scaled, y, test_size=0.2,
 ↪random_state=42, stratify=y)

def evaluate_model(model, X_train, X_test, y_train, y_test):
    model.fit(X_train, y_train)
    y_pred = model.predict(X_test)
    accuracy = accuracy_score(y_test, y_pred)
    report = classification_report(y_test, y_pred, output_dict=True)
    cm = confusion_matrix(y_test, y_pred)
    return accuracy, report, cm
```

```python
models = {
    "Random Forest": RandomForestClassifier(random_state=42, max_depth=10,␣
 ↪min_samples_split=5),
    "Gradient Boosting": GradientBoostingClassifier(random_state=42,␣
 ↪max_depth=5, learning_rate=0.1),
    "SVM (L2 Regularization)": SVC(kernel="linear", C=1.0, random_state=42),
    "Logistic Regression": LogisticRegression(penalty="l2", C=1.0,␣
 ↪max_iter=1000, random_state=42),
    "Ridge Classifier": RidgeClassifier(alpha=1.0, random_state=42),
}

results = {}
for name, model in models.items():
    print(f"Training {name}...")
    accuracy, report, cm = evaluate_model(model, X_train, X_test, y_train,␣
 ↪y_test)
    results[name] = {"Accuracy": accuracy, "Report": report, "Confusion Matrix":
 ↪ cm}
    print(f"{name} Accuracy: {accuracy:.4f}")
    print("Classification Report:")
    print(pd.DataFrame(report).T)
    print("\n")

fig, axes = plt.subplots(2, 3, figsize=(15, 10))
axes = axes.flatten()
for i, (name, result) in enumerate(results.items()):
    cm = result["Confusion Matrix"]
    disp = ConfusionMatrixDisplay(confusion_matrix=cm, display_labels=np.
 ↪unique(y))
    disp.plot(ax=axes[i], cmap="Blues", colorbar=False)
    axes[i].set_title(f"{name} Confusion Matrix")
    axes[i].grid(False)
plt.tight_layout()
plt.show()

###############################################################################
# 4. Feature Importance (for Tree-Based Models)
###############################################################################
rf_model = models["Random Forest"]
feature_importances = rf_model.feature_importances_
sorted_indices = np.argsort(feature_importances)[::-1]

plt.figure(figsize=(12, 6))
plt.bar(range(len(feature_importances)), feature_importances[sorted_indices])
```

```python
plt.xticks(range(len(feature_importances)), [f"Feature {i+1}" for i in
    ↪sorted_indices], rotation=90)
plt.title("Random Forest Feature Importance")
plt.xlabel("Features")
plt.ylabel("Importance Score")
plt.tight_layout()
plt.show()
```

Skipping file due to unexpected format:
C:/Users/User/Desktop/happy/12floor_dam,undam\Acc_und.txt

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_10_dam\Acc10_0.05.txt –
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',

```
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_10_dam\Acc10_0.1.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',

'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_10_dam\Acc10_0.15.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_10_dam\Acc10_0.2.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
```

```
+ list(range(2, 14)), nrows=100000)
```

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_10_dam\Acc10_0.25.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_10_dam\Acc10_0.3.txt -

```
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_11_dam\Acc11_0.05.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',

'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_11_dam\Acc11_0.1.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',

```
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_11_dam\Acc11_0.15.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
```

'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_11_dam\Acc11_0.2.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',

```
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

```
Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_11_dam\Acc11_0.25.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
```

```
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_11_dam\Acc11_0.3.txt –
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',

```
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_12_dam\Acc12_0.05.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
```

'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_12_dam\Acc12_0.1.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',

```
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_12_dam\Acc12_0.15.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_12_dam\Acc12_0.2.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
```

```
+ list(range(2, 14)), nrows=100000)
```

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_12_dam\Acc12_0.25.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_12_dam\Acc12_0.3.txt -

```
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

```
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_1_dam\Acc1_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
```

```
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_1_dam\Acc1_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
```

'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_1_dam\Acc1_0.15.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',

'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_1_dam\Acc1_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',

'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_1_dam\Acc1_0.25.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',

```
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_1_dam\Acc1_0.3.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',

```
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_2_dam\Acc2_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
```

'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_2_dam\Acc2_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
```

```
data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_2_dam\Acc2_0.15.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_2_dam\Acc2_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',

```
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_2_dam\Acc2_0.25.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
```

```
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_2_dam\Acc2_0.3.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',

'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_3_dam\Acc3_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',

```
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

```
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_3_dam\Acc3_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
```

```
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

```
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_3_dam\Acc3_0.15.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
```

'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
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  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_3_dam\Acc3_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',

'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_3_dam\Acc3_0.25.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_3_dam\Acc3_0.3.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_4_dam\Acc4_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_4_dam\Acc4_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',

'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_4_dam\Acc4_0.15.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',

```
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_4_dam\Acc4_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',

'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_4_dam\Acc4_0.25.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',

'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_4_dam\Acc4_0.3.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',

'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_5_dam\Acc5_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',

```
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

```
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_5_dam\Acc5_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
```

```
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_5_dam\Acc5_0.15.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and

will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_5_dam\Acc5_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_5_dam\Acc5_0.25.txt

- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_5_dam\Acc5_0.3.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',

```
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

```
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_6_dam\Acc6_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
```

```
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_6_dam\Acc6_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
```

```
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

```
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_6_dam\Acc6_0.15.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
```

```
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

```
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_6_dam\Acc6_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
```

```
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

```
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_6_dam\Acc6_0.25.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
```

'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_6_dam\Acc6_0.3.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',

'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_7_dam\Acc7_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead

```
    data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_7_dam\Acc7_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_7_dam\Acc7_0.15.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',

```
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

```
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_7_dam\Acc7_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
```

```
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_7_dam\Acc7_0.25.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',

```
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_7_dam\Acc7_0.3.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
```

'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_8_dam\Acc8_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',

'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_8_dam\Acc8_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',

'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_8_dam\Acc8_0.15.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',

'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_8_dam\Acc8_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
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  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_8_dam\Acc8_0.25.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

```
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_8_dam\Acc8_0.3.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_9_dam\Acc9_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
```

```
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_9_dam\Acc9_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
```

```
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

```
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_9_dam\Acc9_0.15.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
```

'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_9_dam\Acc9_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',

```
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
```

```
C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)
```

```
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_9_dam\Acc9_0.25.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
```

'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

C:\Users\User\AppData\Local\Temp\ipykernel_17088\2084935547.py:68:
FutureWarning: The 'delim_whitespace' keyword in pd.read_csv is deprecated and
will be removed in a future version. Use ``sep='\s+'`` instead
  data = pd.read_csv(file_path, delim_whitespace=True, header=None, usecols=[0]
+ list(range(2, 14)), nrows=100000)

Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_9_dam\Acc9_0.3.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',

```
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Training Random Forest…
Random Forest Accuracy: 0.8036
Classification Report:
              precision    recall  f1-score      support
0              0.783688  0.944444  0.856589   936.000000
1              0.745455  0.788462  0.766355   936.000000
2              0.812073  0.761752  0.786108   936.000000
3              0.768025  0.785256  0.776545   936.000000
4              0.832957  0.788462  0.810099   936.000000
5              0.907336  0.753205  0.823117   936.000000
accuracy       0.803597  0.803597  0.803597     0.803597
macro avg      0.808256  0.803597  0.803136  5616.000000
weighted avg   0.808256  0.803597  0.803136  5616.000000


Training Gradient Boosting…
```

```
---------------------------------------------------------------------------
KeyboardInterrupt                         Traceback (most recent call last)
Cell In[15], line 121
    119 for name, model in models.items():
    120     print(f"Training {name}…")
--> 121     accuracy, report, cm =␣
  ↪evaluate_model(model, X_train, X_test, y_train, y_test)
    122     results[name] = {"Accuracy": accuracy, "Report": report, "Confusion␣
  ↪Matrix": cm}
    123     print(f"{name} Accuracy: {accuracy:.4f}")

Cell In[15], line 103, in evaluate_model(model, X_train, X_test, y_train, y_test)
    102 def evaluate_model(model, X_train, X_test, y_train, y_test):
--> 103     model.fit(X_train, y_train)
    104     y_pred = model.predict(X_test)
    105     accuracy = accuracy_score(y_test, y_pred)

File c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\base.py:1389, in␣
  ↪_fit_context.<locals>.decorator.<locals>.wrapper(estimator, *args, **kwargs)
   1382     estimator._validate_params()
   1384 with config_context(
   1385     skip_parameter_validation=(
   1386         prefer_skip_nested_validation or global_skip_validation
```

```
      1387        )
      1388    ):
-> 1389        return fit_method(estimator, *args, **kwargs)

File c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\ensemble\_gb.py:
  ↪787, in BaseGradientBoosting.fit(self, X, y, sample_weight, monitor)
       784        self._resize_state()
       786    # fit the boosting stages
--> 787    n_stages = self._fit_stages(
       788        X_train,
       789        y_train,
       790        raw_predictions,
       791        sample_weight_train,
       792        self._rng,
       793        X_val,
       794        y_val,
       795        sample_weight_val,
       796        begin_at_stage,
       797        monitor,
       798    )
       800    # change shape of arrays after fit (early-stopping or additional ests)
       801    if n_stages != self.estimators_.shape[0]:

File c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\ensemble\_gb.py:
  ↪883, in BaseGradientBoosting._fit_stages(self, X, y, raw_predictions,␣
  ↪sample_weight, random_state, X_val, y_val, sample_weight_val, begin_at_stage, ␣
  ↪monitor)
       876            initial_loss = factor * self._loss(
       877                y_true=y_oob_masked,
       878                raw_prediction=raw_predictions[~sample_mask],
       879                sample_weight=sample_weight_oob_masked,
       880            )
       882    # fit next stage of trees
--> 883    raw_predictions = self._fit_stage(
       884        i,
       885        X,
       886        y,
       887        raw_predictions,
       888        sample_weight,
       889        sample_mask,
       890        random_state,
       891        X_csc=X_csc,
       892        X_csr=X_csr,
       893    )
       895    # track loss
       896    if do_oob:
```

91

```
File c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\ensemble\_gb.py:
  ↪489, in BaseGradientBoosting._fit_stage(self, i, X, y, raw_predictions,␣
  ↪sample_weight, sample_mask, random_state, X_csc, X_csr)
    486     sample_weight = sample_weight * sample_mask.astype(np.float64)
    488 X = X_csc if X_csc is not None else X
--> 489 tree.fit(
    490     X, neg_g_view[:, k], sample_weight=sample_weight, check_input=False
    491 )
    493 # update tree leaves
    494 X_for_tree_update = X_csr if X_csr is not None else X

File c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\base.py:1389, in␣
  ↪_fit_context.<locals>.decorator.<locals>.wrapper(estimator, *args, **kwargs)
    1382     estimator._validate_params()
    1384 with config_context(
    1385     skip_parameter_validation=(
    1386         prefer_skip_nested_validation or global_skip_validation
    1387     )
    1388 ):
-> 1389     return fit_method(estimator, *args, **kwargs)

File c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\tree\_classes.py:
  ↪1399, in DecisionTreeRegressor.fit(self, X, y, sample_weight, check_input)
    1369 @_fit_context(prefer_skip_nested_validation=True)
    1370 def fit(self, X, y, sample_weight=None, check_input=True):
    1371     """Build a decision tree regressor from the training set (X, y).
    1372
    1373     Parameters
    (…)
    1396         Fitted estimator.
    1397     """
-> 1399     super()._fit(
    1400         X,
    1401         y,
    1402         sample_weight=sample_weight,
    1403         check_input=check_input,
    1404     )
    1405     return self

File c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\tree\_classes.py:
  ↪472, in BaseDecisionTree._fit(self, X, y, sample_weight, check_input,␣
  ↪missing_values_in_feature_mask)
    461 else:
    462     builder = BestFirstTreeBuilder(
    463         splitter,
    464         min_samples_split,
    (…)
    469         self.min_impurity_decrease,
```

```
    470     )
--> 472␣
    ↪builder.build(self.tree_, X, y, sample_weight, missing_values_in_feature_mask
    474 if self.n_outputs_ == 1 and is_classifier(self):
    475     self.n_classes_ = self.n_classes_[0]


KeyboardInterrupt:
```

```
[16]: # After combining all DataFrames
      combined_data = pd.concat(data_frames, ignore_index=True)
      print("Combined Data Shape:", combined_data.shape)
      print("\nPreview of Combined Data:")
      print(combined_data.head())
```

```
Combined Data Shape: (28080, 97)

Preview of Combined Data:
   Feature1_Signal_Length  Feature1_Non_Zero_Count  Feature1_TKEO_Mean  \
0                     256                      256            0.268692
1                     256                      256            0.237748
2                     256                      256            0.308041
3                     256                      256            0.230600
4                     256                      256            0.264897

   Feature1_TKEO_Median  Feature1_PSD_Median  Feature1_PSD_Mean  \
0              0.183743             0.001724           0.002577
1              0.144712             0.001574           0.003065
2              0.211108             0.002559           0.003716
3              0.138204             0.001753           0.003900
4              0.168251             0.001496           0.002939

   Feature1_Sign_Changes  Feature1_Zero_Crossing_Rate  Feature2_Signal_Length  \
0                    100                     0.390625                     256
1                    117                     0.457031                     256
2                     93                     0.363281                     256
3                     91                     0.355469                     256
4                     99                     0.386719                     256

   Feature2_Non_Zero_Count  …  Feature11_Zero_Crossing_Rate  \
0                      256  …                      0.429688
1                      256  …                      0.363281
2                      256  …                      0.476562
3                      256  …                      0.367188
4                      256  …                      0.390625

   Feature12_Signal_Length  Feature12_Non_Zero_Count  Feature12_TKEO_Mean  \
0                      256                       256             0.244679
```

```
1                    256                    256             0.223334
2                    256                    256             0.275087
3                    256                    256             0.204231
4                    256                    256             0.234373

   Feature12_TKEO_Median  Feature12_PSD_Median  Feature12_PSD_Mean  \
0               0.161885              0.001714            0.003178
1               0.145833              0.001564            0.003983
2               0.120755              0.002533            0.003535
3               0.112535              0.001803            0.003750
4               0.165273              0.001642            0.003500

   Feature12_Sign_Changes  Feature12_Zero_Crossing_Rate  Damage
0                     105                      0.410156       0
1                      93                      0.363281       0
2                     102                      0.398438       0
3                      88                      0.343750       0
4                     104                      0.406250       0

[5 rows x 97 columns]
```

```python
import warnings
warnings.simplefilter(action='ignore', category=FutureWarning)

import numpy as np
import pandas as pd
import glob
import re
from scipy.signal import welch
from sklearn.model_selection import train_test_split, GridSearchCV
from sklearn.preprocessing import StandardScaler
from sklearn.ensemble import RandomForestClassifier, GradientBoostingClassifier
from sklearn.linear_model import LogisticRegression, RidgeClassifier
from sklearn.metrics import accuracy_score, classification_report,␣
 ↪confusion_matrix, ConfusionMatrixDisplay
import matplotlib.pyplot as plt


###############################################################################
# 1. Define Robust Feature Extraction Function
###############################################################################
def extract_robust_features(x, dt):
    features = {}
    n = len(x)
    # 1. Signal Length
    features['Signal_Length'] = n
    # 2. Non-Zero Count
    features['Non_Zero_Count'] = np.count_nonzero(x)
```

```python
    # 3. TKEO Mean and 4. TKEO Median
    tkeo = x[1:-1]**2 - x[:-2] * x[2:]
    features['TKEO_Mean'] = np.mean(tkeo) if len(tkeo) > 0 else np.nan
    features['TKEO_Median'] = np.median(tkeo) if len(tkeo) > 0 else np.nan
    # 5-6. PSD Median and Mean
    freqs, psd_vals = welch(x, fs=1/dt)
    features['PSD_Median'] = np.median(psd_vals)
    features['PSD_Mean'] = np.mean(psd_vals)
    # 7. Sign Changes
    sign_changes = np.sum((x[:-1] * x[1:]) < 0)
    features['Sign_Changes'] = sign_changes
    # 8. Zero Crossing Rate
    features['Zero_Crossing_Rate'] = sign_changes / n
    return features


###############################################################################
# 2. Process Files and Extract Features
###############################################################################
# Automatically detect all files (assuming 72 files)
file_paths = glob.glob("C:/Users/User/Desktop/happy/12floor_dam,undam/**/*.
 ↪txt", recursive=True)


# Use regex to extract numeric damage level and skip files that don't match␣
 ↪expected pattern
damage_levels = sorted(set(
    float(match.group(1))
    for fp in file_paths
    if (match := re.search(r'_(\d+\.?\d*)\.txt$', fp))
))


# Debug: print any file paths that do not match the expected pattern
for fp in file_paths:
    if not re.search(r'_(\d+\.?\d*)\.txt$', fp):
        print(f"Skipping file due to unexpected format: {fp}")


label_map = {level: idx for idx, level in enumerate(damage_levels)}

segment_size = 256
data_frames = []


for file_path in file_paths:
    # Skip files that do not match the expected damage level format
    if not re.search(r'_(\d+\.?\d*)\.txt$', file_path):
        continue

    # Read file selecting Time (column 0) and Features (columns 2-13)
```

```python
    data = pd.read_csv(file_path, delim_whitespace=True, header=None,
 ↪usecols=[0] + list(range(2, 14)), nrows=100000)
    data.columns = ['Time'] + [f'Feature{i}' for i in range(1, 13)]
    dt = data['Time'].diff().iloc[1]

    # Extract damage level using regex and map it to a label
    damage_level = float(re.search(r'_(\d+\.?\d*)\.txt$', file_path).group(1))
    label = label_map[damage_level]

    feature_list = []
    for start in range(0, len(data) - segment_size + 1, segment_size):
        segment_features = {}
        for col in data.columns[1:]:
            signal = data[col].values[start:start + segment_size]
            feat = extract_robust_features(signal, dt)
            for key, value in feat.items():
                segment_features[f"{col}_{key}"] = value
        segment_features['Damage'] = label
        feature_list.append(segment_features)

    df_features = pd.DataFrame(feature_list)
    # Optional debug print: check column consistency
    print(f"Processing {file_path} - Columns: {df_features.columns.tolist()}")
    data_frames.append(df_features)

combined_data = pd.concat(data_frames, ignore_index=True)
print("Combined Data Shape:", combined_data.shape)
print("Preview of Combined Data:")
print(combined_data.head())


###############################################################################
# 3. Prepare Data for Modeling
###############################################################################
X = combined_data.drop(columns=['Damage'])
y = combined_data['Damage']

scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)
X_train, X_test, y_train, y_test = train_test_split(X_scaled, y, test_size=0.4,
 ↪random_state=42, stratify=y)


###############################################################################
# 4. Hyperparameter Tuning with GridSearchCV
###############################################################################
# Define parameter grids for each model
param_grid_rf = {
    'n_estimators': [50, 100, 200],
```

```python
    'max_depth': [None, 10, 20],
    'min_samples_split': [2, 5, 10]
}

param_grid_gb = {
    'n_estimators': [50, 100, 200],
    'learning_rate': [0.01, 0.1, 0.2],
    'max_depth': [3, 5, 7]
}

param_grid_logreg = {
    'C': [0.1, 1, 10],
    'penalty': ['l2'],
    'solver': ['lbfgs']
}

param_grid_ridge = {
    'alpha': [0.1, 1.0, 10.0]
}

# Hyperparameter tuning for Random Forest
grid_search_rf = GridSearchCV(
    RandomForestClassifier(random_state=42),
    param_grid_rf,
    cv=3,
    scoring='accuracy'
)
grid_search_rf.fit(X_train, y_train)
print("Random Forest best parameters:", grid_search_rf.best_params_)
print("Random Forest best cross-validation score:", grid_search_rf.best_score_)

# Hyperparameter tuning for Gradient Boosting
grid_search_gb = GridSearchCV(
    GradientBoostingClassifier(random_state=42),
    param_grid_gb,
    cv=3,
    scoring='accuracy'
)
grid_search_gb.fit(X_train, y_train)
print("Gradient Boosting best parameters:", grid_search_gb.best_params_)
print("Gradient Boosting best cross-validation score:", grid_search_gb.
 ↪best_score_)

# Hyperparameter tuning for Logistic Regression
grid_search_logreg = GridSearchCV(
    LogisticRegression(max_iter=1000, random_state=42),
    param_grid_logreg,
```

```
        cv=3,
        scoring='accuracy'
)
grid_search_logreg.fit(X_train, y_train)
print("Logistic Regression best parameters:", grid_search_logreg.best_params_)
print("Logistic Regression best cross-validation score:", grid_search_logreg.
  ↪best_score_)

# Hyperparameter tuning for Ridge Classifier
grid_search_ridge = GridSearchCV(
    RidgeClassifier(random_state=42),
    param_grid_ridge,
    cv=3,
    scoring='accuracy'
)
grid_search_ridge.fit(X_train, y_train)
print("Ridge Classifier best parameters:", grid_search_ridge.best_params_)
print("Ridge Classifier best cross-validation score:", grid_search_ridge.
  ↪best_score_)

###############################################################################
# 5. Evaluate Best Models on Test Set
###############################################################################
best_rf = grid_search_rf.best_estimator_
rf_test_accuracy = best_rf.score(X_test, y_test)
print("Test Accuracy (Random Forest):", rf_test_accuracy)

best_gb = grid_search_gb.best_estimator_
gb_test_accuracy = best_gb.score(X_test, y_test)
print("Test Accuracy (Gradient Boosting):", gb_test_accuracy)

best_logreg = grid_search_logreg.best_estimator_
logreg_test_accuracy = best_logreg.score(X_test, y_test)
print("Test Accuracy (Logistic Regression):", logreg_test_accuracy)

best_ridge = grid_search_ridge.best_estimator_
ridge_test_accuracy = best_ridge.score(X_test, y_test)
print("Test Accuracy (Ridge Classifier):", ridge_test_accuracy)
```

Skipping file due to unexpected format:
C:/Users/User/Desktop/happy/12floor_dam,undam\Acc_und.txt
Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_10_dam\Acc10_0.05.txt -
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'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
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'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_11_dam\Acc11_0.15.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
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'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']

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Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_11_dam\Acc11_0.2.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
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'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
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'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
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'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
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'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
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'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
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'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_11_dam\Acc11_0.25.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
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'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
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'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
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'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_11_dam\Acc11_0.3.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
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'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
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'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
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Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_12_dam\Acc12_0.05.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_12_dam\Acc12_0.1.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
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'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_12_dam\Acc12_0.15.txt -
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Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
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'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
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'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
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'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
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'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
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'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_12_dam\Acc12_0.2.txt -
Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_12_dam\Acc12_0.25.txt -
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'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
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Processing
C:/Users/User/Desktop/happy/12floor_dam,undam\acc_12_dam\Acc12_0.3.txt -
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_1_dam\Acc1_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_1_dam\Acc1_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_1_dam\Acc1_0.15.txt
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_1_dam\Acc1_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_1_dam\Acc1_0.25.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_1_dam\Acc1_0.3.txt

- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
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'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_2_dam\Acc2_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_2_dam\Acc2_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
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'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_2_dam\Acc2_0.15.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_2_dam\Acc2_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_2_dam\Acc2_0.25.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_2_dam\Acc2_0.3.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_3_dam\Acc3_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_3_dam\Acc3_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_3_dam\Acc3_0.15.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
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'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
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'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_3_dam\Acc3_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
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'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
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'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
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'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_3_dam\Acc3_0.25.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_3_dam\Acc3_0.3.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
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'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_4_dam\Acc4_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_4_dam\Acc4_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_4_dam\Acc4_0.15.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_4_dam\Acc4_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
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'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
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'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
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'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_4_dam\Acc4_0.25.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
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'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
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'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_4_dam\Acc4_0.3.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
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'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_5_dam\Acc5_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_5_dam\Acc5_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
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'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_5_dam\Acc5_0.15.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
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'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_5_dam\Acc5_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
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'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_5_dam\Acc5_0.25.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
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'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_5_dam\Acc5_0.3.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
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'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
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'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_6_dam\Acc6_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_6_dam\Acc6_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_6_dam\Acc6_0.15.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_6_dam\Acc6_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
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'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_6_dam\Acc6_0.25.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
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'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_6_dam\Acc6_0.3.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
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'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
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'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_7_dam\Acc7_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_7_dam\Acc7_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_7_dam\Acc7_0.15.txt
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_7_dam\Acc7_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_7_dam\Acc7_0.25.txt
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_7_dam\Acc7_0.3.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_8_dam\Acc8_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_8_dam\Acc8_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_8_dam\Acc8_0.15.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_8_dam\Acc8_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
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'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_8_dam\Acc8_0.25.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
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'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
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'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
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'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_8_dam\Acc8_0.3.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_9_dam\Acc9_0.05.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_9_dam\Acc9_0.1.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_9_dam\Acc9_0.15.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
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'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
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'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_9_dam\Acc9_0.2.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
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'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
```

'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_9_dam\Acc9_0.25.txt
- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Processing C:/Users/User/Desktop/happy/12floor_dam,undam\acc_9_dam\Acc9_0.3.txt

- Columns: ['Feature1_Signal_Length', 'Feature1_Non_Zero_Count',
'Feature1_TKEO_Mean', 'Feature1_TKEO_Median', 'Feature1_PSD_Median',
'Feature1_PSD_Mean', 'Feature1_Sign_Changes', 'Feature1_Zero_Crossing_Rate',
'Feature2_Signal_Length', 'Feature2_Non_Zero_Count', 'Feature2_TKEO_Mean',
'Feature2_TKEO_Median', 'Feature2_PSD_Median', 'Feature2_PSD_Mean',
'Feature2_Sign_Changes', 'Feature2_Zero_Crossing_Rate',
'Feature3_Signal_Length', 'Feature3_Non_Zero_Count', 'Feature3_TKEO_Mean',
'Feature3_TKEO_Median', 'Feature3_PSD_Median', 'Feature3_PSD_Mean',
'Feature3_Sign_Changes', 'Feature3_Zero_Crossing_Rate',
'Feature4_Signal_Length', 'Feature4_Non_Zero_Count', 'Feature4_TKEO_Mean',
'Feature4_TKEO_Median', 'Feature4_PSD_Median', 'Feature4_PSD_Mean',
'Feature4_Sign_Changes', 'Feature4_Zero_Crossing_Rate',
'Feature5_Signal_Length', 'Feature5_Non_Zero_Count', 'Feature5_TKEO_Mean',
'Feature5_TKEO_Median', 'Feature5_PSD_Median', 'Feature5_PSD_Mean',
'Feature5_Sign_Changes', 'Feature5_Zero_Crossing_Rate',
'Feature6_Signal_Length', 'Feature6_Non_Zero_Count', 'Feature6_TKEO_Mean',
'Feature6_TKEO_Median', 'Feature6_PSD_Median', 'Feature6_PSD_Mean',
'Feature6_Sign_Changes', 'Feature6_Zero_Crossing_Rate',
'Feature7_Signal_Length', 'Feature7_Non_Zero_Count', 'Feature7_TKEO_Mean',
'Feature7_TKEO_Median', 'Feature7_PSD_Median', 'Feature7_PSD_Mean',
'Feature7_Sign_Changes', 'Feature7_Zero_Crossing_Rate',
'Feature8_Signal_Length', 'Feature8_Non_Zero_Count', 'Feature8_TKEO_Mean',
'Feature8_TKEO_Median', 'Feature8_PSD_Median', 'Feature8_PSD_Mean',
'Feature8_Sign_Changes', 'Feature8_Zero_Crossing_Rate',
'Feature9_Signal_Length', 'Feature9_Non_Zero_Count', 'Feature9_TKEO_Mean',
'Feature9_TKEO_Median', 'Feature9_PSD_Median', 'Feature9_PSD_Mean',
'Feature9_Sign_Changes', 'Feature9_Zero_Crossing_Rate',
'Feature10_Signal_Length', 'Feature10_Non_Zero_Count', 'Feature10_TKEO_Mean',
'Feature10_TKEO_Median', 'Feature10_PSD_Median', 'Feature10_PSD_Mean',
'Feature10_Sign_Changes', 'Feature10_Zero_Crossing_Rate',
'Feature11_Signal_Length', 'Feature11_Non_Zero_Count', 'Feature11_TKEO_Mean',
'Feature11_TKEO_Median', 'Feature11_PSD_Median', 'Feature11_PSD_Mean',
'Feature11_Sign_Changes', 'Feature11_Zero_Crossing_Rate',
'Feature12_Signal_Length', 'Feature12_Non_Zero_Count', 'Feature12_TKEO_Mean',
'Feature12_TKEO_Median', 'Feature12_PSD_Median', 'Feature12_PSD_Mean',
'Feature12_Sign_Changes', 'Feature12_Zero_Crossing_Rate', 'Damage']
Combined Data Shape: (28080, 97)
Preview of Combined Data:
   Feature1_Signal_Length Feature1_Non_Zero_Count Feature1_TKEO_Mean \
0   256   256   0.268692
1   256   256   0.237748
2   256   256   0.308041
3   256   256   0.230600
4   256   256   0.264897

   Feature1_TKEO_Median Feature1_PSD_Median Feature1_PSD_Mean \
0   0.183743   0.001724   0.002577
1   0.144712   0.001574   0.003065

```
2              0.211108           0.002559          0.003716
3              0.138204           0.001753          0.003900
4              0.168251           0.001496          0.002939


   Feature1_Sign_Changes  Feature1_Zero_Crossing_Rate  Feature2_Signal_Length  \
0                    100                     0.390625                     256
1                    117                     0.457031                     256
2                     93                     0.363281                     256
3                     91                     0.355469                     256
4                     99                     0.386719                     256


   Feature2_Non_Zero_Count  …  Feature11_Zero_Crossing_Rate  \
0                      256  …                      0.429688
1                      256  …                      0.363281
2                      256  …                      0.476562
3                      256  …                      0.367188
4                      256  …                      0.390625


   Feature12_Signal_Length  Feature12_Non_Zero_Count  Feature12_TKEO_Mean  \
0                      256                       256             0.244679
1                      256                       256             0.223334
2                      256                       256             0.275087
3                      256                       256             0.204231
4                      256                       256             0.234373


   Feature12_TKEO_Median  Feature12_PSD_Median  Feature12_PSD_Mean  \
0               0.161885              0.001714            0.003178
1               0.145833              0.001564            0.003983
2               0.120755              0.002533            0.003535
3               0.112535              0.001803            0.003750
4               0.165273              0.001642            0.003500


   Feature12_Sign_Changes  Feature12_Zero_Crossing_Rate  Damage
0                     105                      0.410156       0
1                      93                      0.363281       0
2                     102                      0.398438       0
3                      88                      0.343750       0
4                     104                      0.406250       0

[5 rows x 97 columns]
Random Forest best parameters: {'max_depth': None, 'min_samples_split': 5,
'n_estimators': 100}
Random Forest best cross-validation score: 0.978454415954416
```

```
---------------------------------------------------------------------------
KeyboardInterrupt                         Traceback (most recent call last)
Cell In[17], line 153
```

```
    146 # Hyperparameter tuning for Gradient Boosting
    147 grid_search_gb = GridSearchCV(
    148     GradientBoostingClassifier(random_state=42),
    149     param_grid_gb,
    150     cv=3,
    151     scoring='accuracy'
    152 )
--> 153 grid_search_gb.fit(X_train, y_train)
    154 print("Gradient Boosting best parameters:", grid_search_gb.best_params_
    155 print("Gradient Boosting best cross-validation score:", grid_search_gb.
  ↪best_score_)

File c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\base.py:1389, in␣
  ↪_fit_context.<locals>.decorator.<locals>.wrapper(estimator, *args, **kwargs)
   1382     estimator._validate_params()
   1384 with config_context(
   1385     skip_parameter_validation=(
   1386         prefer_skip_nested_validation or global_skip_validation
   1387     )
   1388 ):
-> 1389     return fit_method(estimator, *args, **kwargs)

File c:
  ↪\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\model_selection\_search.
  ↪py:1023, in BaseSearchCV.fit(self, X, y, **params)
   1017     results = self._format_results(
   1018         all_candidate_params, n_splits, all_out, all_more_results
   1019     )
   1021     return results
-> 1023 self._run_search(evaluate_candidates)
   1025 # multimetric is determined here because in the case of a callable
   1026 # self.scoring the return type is only known after calling
   1027 first_test_score = all_out[0]["test_scores"]

File c:
  ↪\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\model_selection\_search.
  ↪py:1570, in GridSearchCV._run_search(self, evaluate_candidates)
   1568 def _run_search(self, evaluate_candidates):
   1569     """Search all candidates in param_grid"""
-> 1570     evaluate_candidates(ParameterGrid(self.param_grid))

File c:
  ↪\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\model_selection\_search.
  ↪py:969, in BaseSearchCV.fit.<locals>.evaluate_candidates(candidate_params, cv␣
  ↪more_results)
    961 if self.verbose > 0:
    962     print(
    963         "Fitting {0} folds for each of {1} candidates,"
    964         " totalling {2} fits".format(
```

```
     965            n_splits, n_candidates, n_candidates * n_splits
     966         )
     967      )
--> 969  out = parallel(
     970      delayed(_fit_and_score)(
     971          clone(base_estimator),
     972          X,
     973          y,
     974          train=train,
     975          test=test,
     976          parameters=parameters,
     977          split_progress=(split_idx, n_splits),
     978          candidate_progress=(cand_idx, n_candidates),
     979          **fit_and_score_kwargs,
     980      )
     981      for (cand_idx, parameters), (split_idx, (train, test)) in product(
     982          enumerate(candidate_params),
     983          enumerate(cv.split(X, y, **routed_params.splitter.split)),
     984      )
     985  )
     987  if len(out) < 1:
     988      raise ValueError(
     989          "No fits were performed. "
     990          "Was the CV iterator empty? "
     991          "Were there no candidates?"
     992      )

File c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\utils\parallel.py
  ↪77, in Parallel.__call__(self, iterable)
     72 config = get_config()
     73 iterable_with_config = (
     74     (_with_config(delayed_func, config), args, kwargs)
     75     for delayed_func, args, kwargs in iterable
     76 )
---> 77 return super().__call__(iterable_with_config)

File c:\Users\User\Desktop\GAN\venv\lib\site-packages\joblib\parallel.py:1918,␣
  ↪in Parallel.__call__(self, iterable)
   1916     output = self._get_sequential_output(iterable)
   1917     next(output)
-> 1918     return output if self.return_generator else list(output)
   1920 # Let's create an ID that uniquely identifies the current call. If the
   1921 # call is interrupted early and that the same instance is immediately
   1922 # re-used, this id will be used to prevent workers that were
   1923 # concurrently finalizing a task from the previous call to run the
   1924 # callback.
   1925 with self._lock:
```

```
File c:\Users\User\Desktop\GAN\venv\lib\site-packages\joblib\parallel.py:1847,␣
 ↪in Parallel._get_sequential_output(self, iterable)
   1845 self.n_dispatched_batches += 1
   1846 self.n_dispatched_tasks += 1
-> 1847 res = func(*args, **kwargs)
   1848 self.n_completed_tasks += 1
   1849 self.print_progress()

File c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\utils\parallel.py
 ↪139, in _FuncWrapper.__call__(self, *args, **kwargs)
    137     config = {}
    138 with config_context(**config):
--> 139     return self.function(*args, **kwargs)

File c:
 ↪\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\model_selection\_valid ition.
 ↪py:866, in _fit_and_score(estimator, X, y, scorer, train, test, verbose,␣
 ↪parameters, fit_params, score_params, return_train_score, return_parameters,␣
 ↪return_n_test_samples, return_times, return_estimator, split_progress,␣
 ↪candidate_progress, error_score)
    864         estimator.fit(X_train, **fit_params)
    865     else:
--> 866         estimator.fit(X_train, y_train, **fit_params)
    868 except Exception:
    869     # Note fit time as time until error
    870     fit_time = time.time() - start_time

File c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\base.py:1389, in␣
 ↪_fit_context.<locals>.decorator.<locals>.wrapper(estimator, *args, **kwargs)
   1382     estimator._validate_params()
   1384 with config_context(
   1385     skip_parameter_validation=(
   1386         prefer_skip_nested_validation or global_skip_validation
   1387     )
   1388 ):
-> 1389     return fit_method(estimator, *args, **kwargs)

File c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\ensemble\_gb.py:
 ↪787, in BaseGradientBoosting.fit(self, X, y, sample_weight, monitor)
    784     self._resize_state()
    786 # fit the boosting stages
--> 787 n_stages = self._fit_stages(
    788     X_train,
    789     y_train,
    790     raw_predictions,
    791     sample_weight_train,
    792     self._rng,
    793     X_val,
    794     y_val,
```

```
795       sample_weight_val,
796       begin_at_stage,
797       monitor,
798 )
800 # change shape of arrays after fit (early-stopping or additional ests)
801 if n_stages != self.estimators_.shape[0]:
```

File **c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\ensemble_gb.py:**
↪**883, in** BaseGradientBoosting._fit_stages**(self, X, y, raw_predictions,␣**
↪**sample_weight, random_state, X_val, y_val, sample_weight_val, begin_at_stage,␣**
↪**monitor)**

```
876          initial_loss = factor * self._loss(
877              y_true=y_oob_masked,
878              raw_prediction=raw_predictions[~sample_mask],
879              sample_weight=sample_weight_oob_masked,
880          )
882 # fit next stage of trees
--> 883 raw_predictions = self._fit_stage(
884     i,
885     X,
886     y,
887     raw_predictions,
888     sample_weight,
889     sample_mask,
890     random_state,
891     X_csc=X_csc,
892     X_csr=X_csr,
893 )
895 # track loss
896 if do_oob:
```

File **c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\ensemble_gb.py:**
↪**489, in** BaseGradientBoosting._fit_stage**(self, i, X, y, raw_predictions,␣**
↪**sample_weight, sample_mask, random_state, X_csc, X_csr)**

```
486     sample_weight = sample_weight * sample_mask.astype(np.float64)
488 X = X_csc if X_csc is not None else X
--> 489 tree.fit(
490     X, neg_g_view[:, k], sample_weight=sample_weight, check_input=False
491 )
493 # update tree leaves
494 X_for_tree_update = X_csr if X_csr is not None else X
```

File **c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\base.py:1389, in␣**
↪_fit_context.<locals>.decorator.<locals>.wrapper**(estimator, *args, **kwargs)**

```
1382     estimator._validate_params()
1384 with config_context(
1385     skip_parameter_validation=(
1386         prefer_skip_nested_validation or global_skip_validation
```

```
      1387        )
      1388 ):
-> 1389        return fit_method(estimator, *args, **kwargs)


File c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\tree\_classes.py:
  ↪1399, in DecisionTreeRegressor.fit(self, X, y, sample_weight, check_input)
      1369 @_fit_context(prefer_skip_nested_validation=True)
      1370 def fit(self, X, y, sample_weight=None, check_input=True):
      1371     """Build a decision tree regressor from the training set (X, y).
      1372
      1373     Parameters
      (...)
      1396         Fitted estimator.
      1397     """
-> 1399     super()._fit(
      1400         X,
      1401         y,
      1402         sample_weight=sample_weight,
      1403         check_input=check_input,
      1404     )
      1405     return self


File c:\Users\User\Desktop\GAN\venv\lib\site-packages\sklearn\tree\_classes.py:
  ↪472, in BaseDecisionTree._fit(self, X, y, sample_weight, check_input,␣
  ↪missing_values_in_feature_mask)
      461 else:
      462     builder = BestFirstTreeBuilder(
      463         splitter,
      464         min_samples_split,
      (...)
      469         self.min_impurity_decrease,
      470     )
--> 472␣
  ↪builder.build(self.tree_, X, y, sample_weight, missing_values_in_feature_mask
      474 if self.n_outputs_ == 1 and is_classifier(self):
      475     self.n_classes_ = self.n_classes_[0]


KeyboardInterrupt:
```