

```

import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.preprocessing import StandardScaler
import zipfile
import os

# Step 1: Mount Google Drive for Faster Access
from google.colab import drive

drive.mount('/content/drive')

# Define file path for the zip file stored in Google Drive
zip_file_path = "/content/drive/MyDrive/8338435.zip"
extracted_folder = "/content/8338435/"

# Extract the zip file
if not os.path.exists(extracted_folder):
    with zipfile.ZipFile(zip_file_path, 'r') as zip_ref:
        zip_ref.extractall(extracted_folder)
    print(f"Files extracted to {extracted_folder}")

# Define file paths for the extracted data
data_file_path = os.path.join(extracted_folder, "data.csv")
metadata_file_path = os.path.join(extracted_folder, "metadata.csv")

# Function to load the dataset
def load_dataset(data_path):
    try:
        if data_path.endswith(".csv"):
            dataset = pd.read_csv(data_path)
        elif data_path.endswith(".parquet"):
            dataset = pd.read_parquet(data_path)
        else:
            raise ValueError("Unsupported file format")
        print("Dataset loaded successfully!")
        return dataset
    except Exception as e:
        print(f"Error loading dataset: {e}")
        return None

# Downcast numerical columns to reduce memory usage
def optimize_memory(data):
    for col in data.select_dtypes(include=['float64']).columns:
        data[col] = data[col].astype('float32')
    for col in data.select_dtypes(include=['int64']).columns:
        data[col] = data[col].astype('int32')
    print(f"Optimized memory usage: {data.memory_usage(deep=True).sum() / 1024 ** 2:.2f} MB")
    return data

# Exploratory Data Analysis (EDA)
def perform_eda(data):
    print("\n--- Dataset Overview ---")
    print(data.info())
    print("\n--- Summary Statistics ---")
    print(data.describe())

    # Plotting time series for selected signals
    signal_columns = data.columns.difference(["timestamp", "category", "y"])
    for signal in signal_columns[:5]: # Plot a few signals to start
        plt.figure(figsize=(12, 6))
        plt.plot(data['timestamp'], data[signal], label=signal)
        plt.title(f"Signal: {signal}")
        plt.xlabel("Time")
        plt.ylabel("Value")
        plt.legend()
        plt.show()

    # Correlation heatmap
    plt.figure(figsize=(10, 8))
    sns.heatmap(data[signal_columns].corr(), annot=True, cmap="coolwarm")
    plt.title("Correlation Heatmap")
    plt.show()

# Preprocessing

```

```

def preprocess_data(data):
    # Handling missing values
    data = data.fillna(method='ffill').fillna(method='bfill')

    # Normalization
    scaler = StandardScaler()
    signal_columns = data.columns.difference(["timestamp", "category", "y"])
    data[signal_columns] = scaler.fit_transform(data[signal_columns])

    # Splitting into train, validation, and test sets
    train_size = int(0.7 * len(data))
    val_size = int(0.15 * len(data))

    train_data = data.iloc[:train_size]
    val_data = data.iloc[train_size:train_size + val_size]
    test_data = data.iloc[train_size + val_size:]

    print("\nData split into train, validation, and test sets.")
    print(f"Train: {len(train_data)} samples, Validation: {len(val_data)} samples, Test: {len(test_data)} samples")

    return train_data, val_data, test_data

# Chunk processing for large datasets with dataset splitting
def process_in_chunks(file_path, chunk_size):
    train_chunks, val_chunks, test_chunks = [], [], []
    chunks = pd.read_csv(file_path, chunksize=chunk_size)
    for i, chunk in enumerate(chunks):
        print(f"Processing chunk {i+1}")
        chunk = optimize_memory(chunk)
        train_size = int(0.7 * len(chunk))
        val_size = int(0.15 * len(chunk))

        train_chunks.append(chunk.iloc[:train_size])
        val_chunks.append(chunk.iloc[train_size:train_size + val_size])
        test_chunks.append(chunk.iloc[train_size + val_size:])

    train_data = pd.concat(train_chunks, ignore_index=True)
    val_data = pd.concat(val_chunks, ignore_index=True)
    test_data = pd.concat(test_chunks, ignore_index=True)

    print("\nChunk processing and dataset splitting completed.")
    return train_data, val_data, test_data


# Main execution
# Load the main dataset
data = load_dataset(data_file_path)

# Optimize memory for the loaded dataset
if data is not None:
    data = optimize_memory(data)

# Perform EDA or process chunks
chunk_size = 1000000 # Process 1 million rows at a time
if data is not None and len(data) > chunk_size:
    train_data, val_data, test_data = process_in_chunks(data_file_path, chunk_size)
else:
    perform_eda(data)
    train_data, val_data, test_data = preprocess_data(data)

# Save processed data to CSV files for further use
if train_data is not None and val_data is not None and test_data is not None:
    train_data.to_csv("/content/drive/MyDrive/8338435/train_data.csv", index=False)
    val_data.to_csv("/content/drive/MyDrive/8338435/val_data.csv", index=False)
    test_data.to_csv("/content/drive/MyDrive/8338435/test_data.csv", index=False)
    print("Preprocessing completed and data saved.")

```

 Mounted at /content/drive  
 Files extracted to /content/8338435/  
 Dataset loaded successfully!  
 Optimized memory usage: 724.79 MB  
 Processing chunk 1  
 Optimized memory usage: 144.96 MB  
 Processing chunk 2  
 Optimized memory usage: 144.96 MB  
 Processing chunk 3  
 Optimized memory usage: 144.96 MB  
 Processing chunk 4

Optimized memory usage: 144.96 MB  
 Processing chunk 5  
 Optimized memory usage: 144.96 MB

Chunk processing and dataset splitting completed.  
 Preprocessing completed and data saved.

```
train_data = pd.read_csv("/content/drive/MyDrive/8338435/train_data.csv")
val_data = pd.read_csv("/content/drive/MyDrive/8338435/val_data.csv")
test_data = pd.read_csv("/content/drive/MyDrive/8338435/test_data.csv")
```

```
print(f"Train Data: {train_data.shape}")
print(f"Validation Data: {val_data.shape}")
print(f"Test Data: {test_data.shape}")
```

```
↗ Train Data: (3500000, 20)
  Validation Data: (750000, 20)
  Test Data: (750000, 20)
```

```
import matplotlib.pyplot as plt
import seaborn as sns
```

```
# Load train_data for EDA
train_data = pd.read_csv("/content/drive/MyDrive/8338435/train_data.csv")
```

```
# 1. Distribution of numerical features
def plot_distributions(data, cols, title="Feature Distributions"):
    data[cols].hist(bins=50, figsize=(20, 15))
    plt.suptitle(title, fontsize=16)
    plt.show()
```

```
# Select numerical columns (excluding timestamp, category, y)
numerical_cols = train_data.columns.difference(["timestamp", "category", "y"])
plot_distributions(train_data, numerical_cols, title="Numerical Feature Distributions")
```

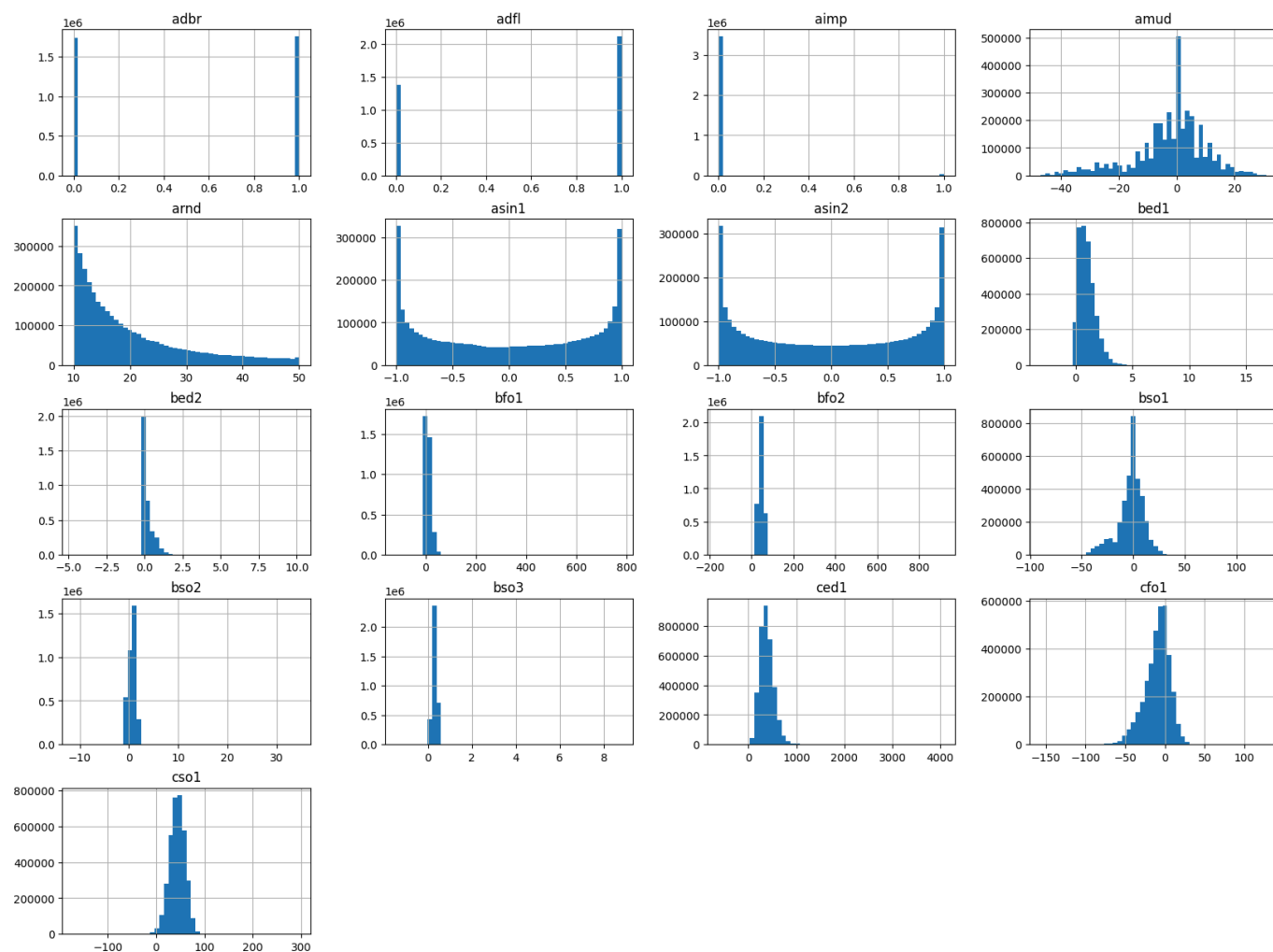
```
# 2. Correlation heatmap
plt.figure(figsize=(15, 10))
sns.heatmap(train_data[numerical_cols].corr(), annot=False, cmap="coolwarm", cbar=True)
plt.title("Correlation Heatmap")
plt.show()
```

```
# 3. Anomaly distributions in 'y' and 'category'
def plot_anomaly_counts(data, col, title):
    counts = data[col].value_counts()
    counts.plot(kind='bar', figsize=(10, 5), color="skyblue")
    plt.title(title)
    plt.xlabel(col)
    plt.ylabel("Count")
    plt.show()
```

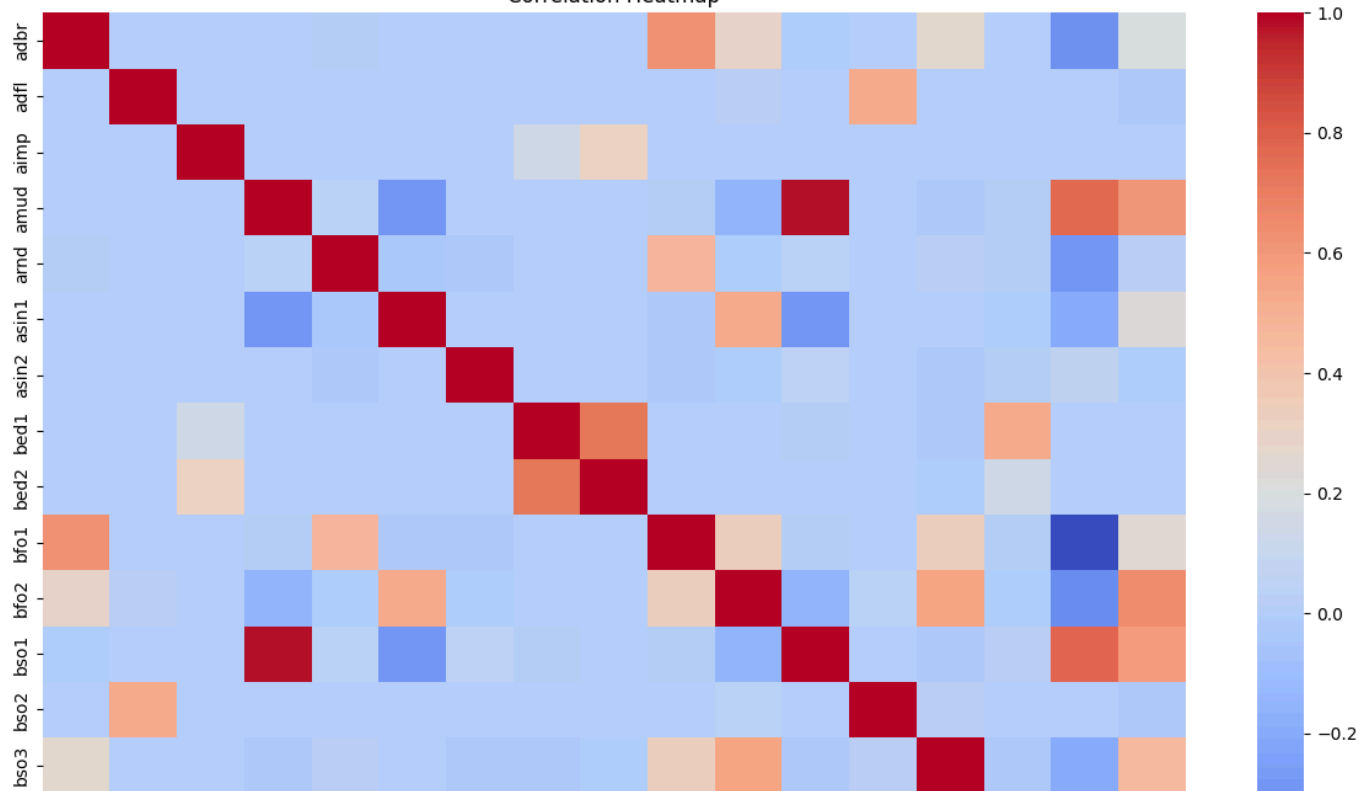
```
plot_anomaly_counts(train_data, "y", title="Anomaly Distribution in 'y'")
plot_anomaly_counts(train_data, "category", title="Anomaly Distribution in 'category'")
```

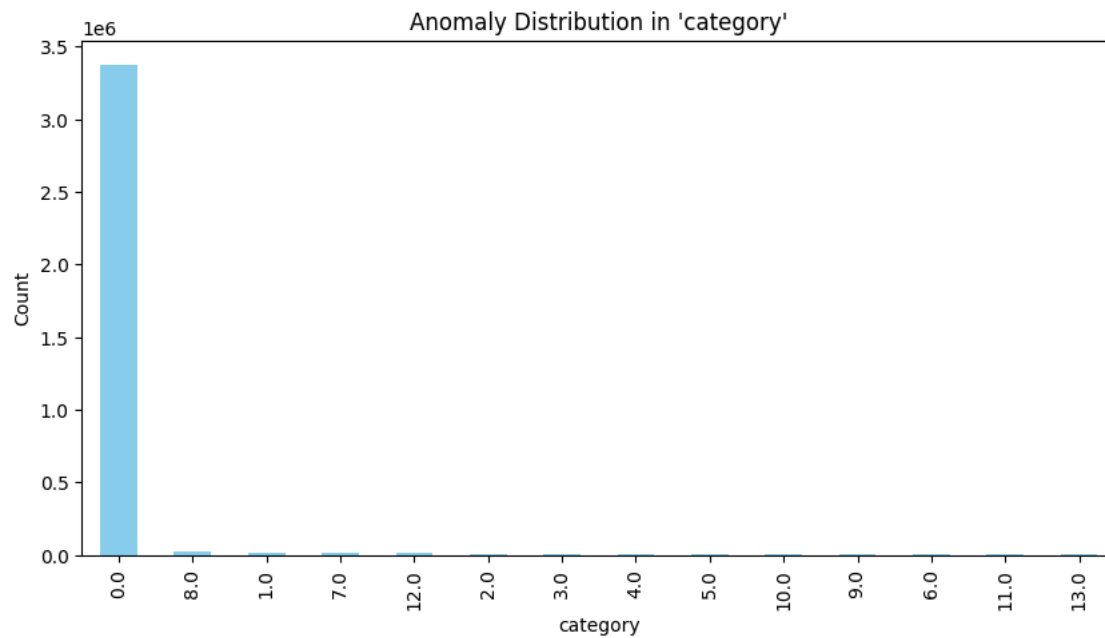
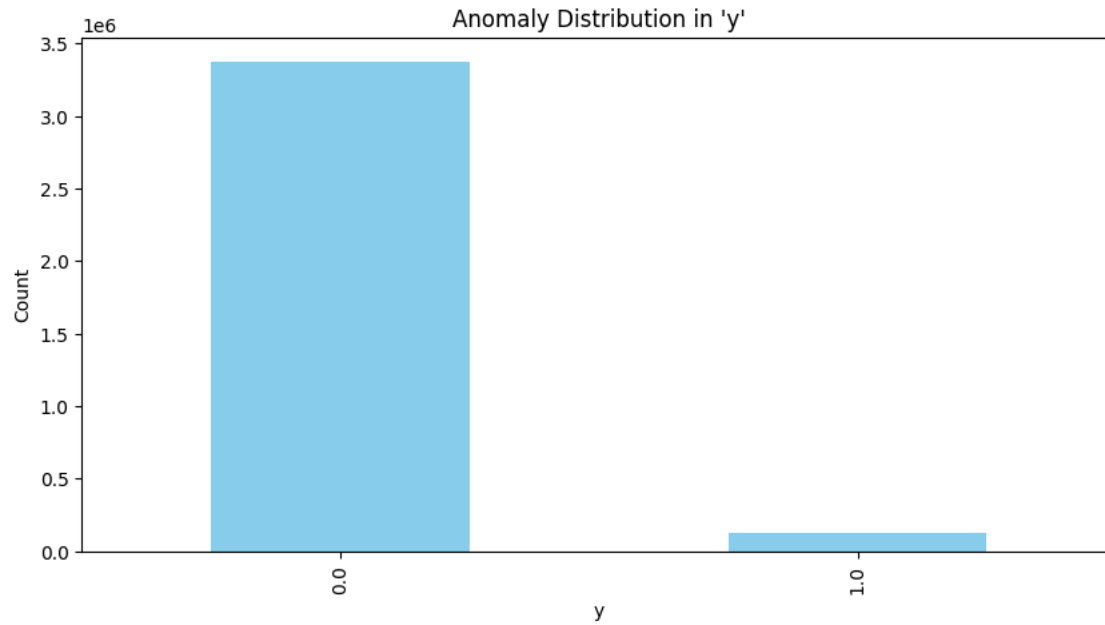
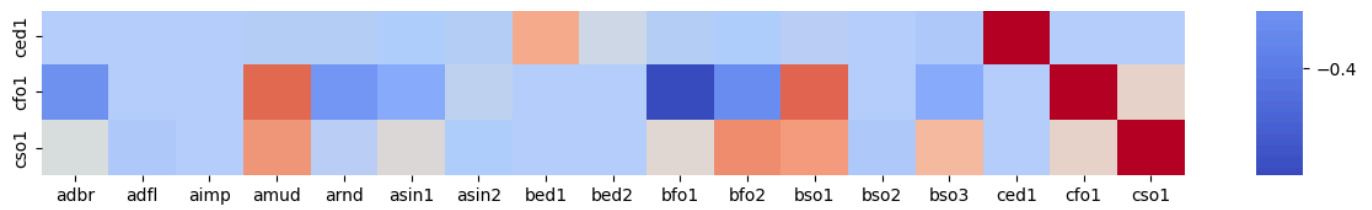


## Numerical Feature Distributions



Correlation Heatmap







```

from sklearn.ensemble import IsolationForest
from sklearn.metrics import classification_report

# Prepare the data for modeling
X_train = train_data[numerical_cols]
y_train = train_data["y"] # Ground truth for evaluation

# Train Isolation Forest
iso_forest = IsolationForest(n_estimators=100, contamination=0.038, random_state=42)
iso_forest.fit(X_train)

# Predict anomalies
train_data["predictions"] = iso_forest.predict(X_train)
train_data["predictions"] = train_data["predictions"].map({1: 0, -1: 1}) # Map to anomaly labels

# Evaluate performance
print("\nClassification Report (Train Data):")
print(classification_report(y_train, train_data["predictions"]))

```



```

Classification Report (Train Data):
              precision    recall  f1-score   support

    0.0         0.97      0.96      0.96     3373092
    1.0         0.08      0.09      0.09     126908

 accuracy         0.93     3500000
 macro avg       0.53      0.53      0.53     3500000
weighted avg       0.93      0.93      0.93     3500000

```

```

# Load test data
test_data = pd.read_csv("/content/drive/MyDrive/8338435/test_data.csv")
X_test = test_data[numerical_cols]
y_test = test_data["y"]

# Predict anomalies on test data
test_data["predictions"] = iso_forest.predict(X_test)
test_data["predictions"] = test_data["predictions"].map({1: 0, -1: 1})

# Evaluate performance
print("\nClassification Report (Test Data):")
print(classification_report(y_test, test_data["predictions"]))

```



```

Classification Report (Test Data):
              precision    recall  f1-score   support

    0.0         0.96      0.96      0.96     714028
    1.0         0.17      0.16      0.17      35972

 accuracy         0.92     750000
 macro avg       0.56      0.56      0.56     750000
weighted avg       0.92      0.92      0.92     750000

```

```

import pandas as pd
import numpy as np
import tensorflow as tf
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import LSTM, Dense, Dropout
from sklearn.preprocessing import MinMaxScaler

# Reload the data
train_data = pd.read_csv("/content/drive/MyDrive/8338435/train_data.csv")
test_data = pd.read_csv("/content/drive/MyDrive/8338435/test_data.csv")

# Define numerical columns (excluding 'timestamp', 'category', 'y')
numerical_cols = train_data.columns.difference(["timestamp", "category", "y"])

# Prepare the data
scaler = MinMaxScaler()
X_train_scaled = scaler.fit_transform(train_data[numerical_cols])
X_test_scaled = scaler.transform(test_data[numerical_cols])

```

```
# Reshape for LSTM input (samples, timesteps, features)
timesteps = 10 # Use last 10 timesteps to predict
X_train_lstm = np.array([X_train_scaled[i - timesteps:i] for i in range(timesteps, len(X_train_scaled))])
y_train_lstm = train_data["y"].iloc[timesteps:].values
X_test_lstm = np.array([X_test_scaled[i - timesteps:i] for i in range(timesteps, len(X_test_scaled))])
y_test_lstm = test_data["y"].iloc[timesteps:].values
```

```
# Build the LSTM model
```

```
model = Sequential([
    LSTM(128, input_shape=(timesteps, X_train_lstm.shape[2]), return_sequences=True),
    Dropout(0.2),
    LSTM(64, return_sequences=False),
    Dropout(0.2),
    Dense(1, activation='sigmoid')
])
```

```
model.compile(optimizer='adam', loss='binary_crossentropy', metrics=['accuracy'])
model.summary()
```

```
# Train the model
```

```
history = model.fit(X_train_lstm, y_train_lstm, validation_split=0.2, epochs=10, batch_size=64)
```

```
# Evaluate the model
```

```
print("\nEvaluation on Test Data:")
model.evaluate(X_test_lstm, y_test_lstm)
```

```
⚠ /usr/local/lib/python3.10/dist-packages/keras/src/layers/rnn/rnn.py:204: UserWarning: Do not pass an `input_shape`/`input_dim` argument
  super().__init__(**kwargs)
Model: "sequential"
```

Layer (type)	Output Shape	Param #
lstm (LSTM)	(None, 10, 128)	74,752
dropout (Dropout)	(None, 10, 128)	0
lstm_1 (LSTM)	(None, 64)	49,408
dropout_1 (Dropout)	(None, 64)	0
dense (Dense)	(None, 1)	65

```
Total params: 124,225 (485.25 KB)
Trainable params: 124,225 (485.25 KB)
Non-trainable params: 0 (0.00 B)
```

```
Epoch 1/10
```

```
43750/43750 ————— 257s 6ms/step - accuracy: 0.9677 - loss: 0.1283 - val_accuracy: 0.9381 - val_loss: 0.3136
```

```
Epoch 2/10
```

```
43750/43750 ————— 249s 6ms/step - accuracy: 0.9814 - loss: 0.0504 - val_accuracy: 0.9447 - val_loss: 0.3824
```

```
Epoch 3/10
```

```
43750/43750 ————— 249s 6ms/step - accuracy: 0.9881 - loss: 0.0317 - val_accuracy: 0.9402 - val_loss: 0.4334
```

```
Epoch 4/10
```

```
43750/43750 ————— 251s 6ms/step - accuracy: 0.9910 - loss: 0.0237 - val_accuracy: 0.9402 - val_loss: 0.4499
```

```
Epoch 5/10
```

```
43750/43750 ————— 252s 6ms/step - accuracy: 0.9927 - loss: 0.0195 - val_accuracy: 0.9425 - val_loss: 0.4107
```

```
Epoch 6/10
```

```
43750/43750 ————— 252s 6ms/step - accuracy: 0.9937 - loss: 0.0168 - val_accuracy: 0.9327 - val_loss: 0.4865
```

```
Epoch 7/10
```

```
43750/43750 ————— 253s 6ms/step - accuracy: 0.9944 - loss: 0.0151 - val_accuracy: 0.9408 - val_loss: 0.4498
```

```
Epoch 8/10
```

```
43750/43750 ————— 252s 6ms/step - accuracy: 0.9950 - loss: 0.0136 - val_accuracy: 0.9421 - val_loss: 0.4802
```

```
Epoch 9/10
```

```
43750/43750 ————— 252s 6ms/step - accuracy: 0.9954 - loss: 0.0124 - val_accuracy: 0.9418 - val_loss: 0.3969
```

```
Epoch 10/10
```

```
43750/43750 ————— 253s 6ms/step - accuracy: 0.9958 - loss: 0.0116 - val_accuracy: 0.9430 - val_loss: 0.4663
```

```
Evaluation on Test Data:
```

```
23438/23438 ————— 50s 2ms/step - accuracy: 0.9646 - loss: 0.2600
[0.4750305414199829, 0.9392578601837158]
```

```
from sklearn.ensemble import GradientBoostingClassifier
from sklearn.metrics import classification_report
```

```
# Train a Gradient Boosting Classifier
```

```
gb_model = GradientBoostingClassifier()
X_train_supervised = train_data[numerical_cols]
y_train_supervised = train_data["y"]
```



```
gb_model.fit(X_train_supervised, y_train_supervised)

# Evaluate on test data
X_test_supervised = test_data[numerical_cols]
y_test_supervised = test_data["y"]
y_pred = gb_model.predict(X_test_supervised)

print("\nClassification Report for Predictive Modeling:")
print(classification_report(y_test_supervised, y_pred))
```



```
-----
KeyboardInterrupt                                Traceback (most recent call last)
<ipython-input-9-4b108a8ba9c9> in <cell line: 8>()
      6 X_train_supervised = train_data[numerical_cols]
      7 y_train_supervised = train_data["y"]
----> 8 gb_model.fit(X_train_supervised, y_train_supervised)
      9
     10 # Evaluate on test data
```

↕ 6 frames

```
/usr/local/lib/python3.10/dist-packages/sklearn/tree/_classes.py in _fit(self, X, y, sample_weight, check_input,
missing_values_in_feature_mask)
    470 )
    471
--> 472     builder.build(self.tree_, X, y, sample_weight, missing_values_in_feature_mask)
    473
    474     if self.n_outputs_ == 1 and is_classifier(self):
```

KeyboardInterrupt:

```
# Simulate real-time processing using sliding windows
window_size = 50
for start in range(0, len(X_test_scaled) - window_size, window_size):
    window_data = X_test_scaled[start:start + window_size]
    predictions = iso_forest.predict(window_data)
    print(f"Window {start}-{start + window_size}: Predictions: {predictions}")
```

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```

/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(

```

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[illegible]

[illegible]

115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1





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```
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest is ignoring this and will make assumptions about feature names instead.
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest is ignoring this and will make assumptions about feature names instead.
  warnings.warn(
```







[https://colab.research.google.com/drive/1ap\\_bI7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb\\_Gani5V&printMode=true](https://colab.research.google.com/drive/1ap_bI7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb_Gani5V&printMode=true) 33/270

[https://colab.research.google.com/drive/1ap\\_bi7X4P-DYgpzXGEullrVizcuD45r?authuser=4#scrollTo=3TLPb\\_Ganj5V&printMode=true](https://colab.research.google.com/drive/1ap_bi7X4P-DYgpzXGEullrVizcuD45r?authuser=4#scrollTo=3TLPb_Ganj5V&printMode=true)

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[https://colab.research.google.com/drive/1ap\\_bI7X4P-DYqpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb\\_Gani5V&printMode=true](https://colab.research.google.com/drive/1ap_bI7X4P-DYqpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb_Gani5V&printMode=true) 46/270

[https://colab.research.google.com/drive/1ap\\_bI7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb\\_Gani5V&printMode=true](https://colab.research.google.com/drive/1ap_bI7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb_Gani5V&printMode=true) 47/270





Window: 06CE8-0679D; Predictions: [1 1]

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[https://colab.research.google.com/drive/1ap\\_bl7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLpb\\_Ganj5V&printMode=true](https://colab.research.google.com/drive/1ap_bl7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLpb_Ganj5V&printMode=true)

[https://colab.research.google.com/drive/1ap\\_bl7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb\\_Ganj5V&printMode=true](https://colab.research.google.com/drive/1ap_bl7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb_Ganj5V&printMode=true) 54/270

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[https://colab.research.google.com/drive/1ap\\_bI7X4P-DYqgzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLpb\\_Gani5V&printMode=true](https://colab.research.google.com/drive/1ap_bI7X4P-DYqgzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLpb_Gani5V&printMode=true) 59/270

```
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
Window 45750-45800: Predictions: [ 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]
Window 45800-45850: Predictions: [ 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]
Window 45850-45900: Predictions: [ 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]
Window 45900-45950: Predictions: [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]
Window 45950-46000: Predictions: [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]
Window 46000-46050: Predictions: [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]
Window 46050-46100: Predictions: [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]
Window 46100-46150: Predictions: [ 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]
Window 46150-46200: Predictions: [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]
Window 46200-46250: Predictions: [ 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]
Window 46250-46300: Predictions: [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]
Window 46300-46350: Predictions: [ 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]
Window 46350-46400: Predictions: [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]
Window 46400-46450: Predictions: [-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]
Window 46450-46500: Predictions: [ 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]
Window 46500-46550: Predictions: [ 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]
Window 46550-46600: Predictions: [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]
Window 46600-46650: Predictions: [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]
Window 46650-46700: Predictions: [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]
Window 46700-46750: Predictions: [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]
Window 46750-46800: Predictions: [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]
Window 46800-46850: Predictions: [ 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]
Window 46850-46900: Predictions: [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]
Window 46900-46950: Predictions: [ 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]
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
```

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[https://colab.research.google.com/drive/1ap\\_bI7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb\\_Gani5V&printMode=true](https://colab.research.google.com/drive/1ap_bI7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb_Gani5V&printMode=true) 62/270

[illegible]

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[illegible]

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[illegible]

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[illegible]

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[illegible]

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[illegible]

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[https://colab.research.google.com/drive/1ap\\_bl7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb\\_Ganj5V&printMode=true](https://colab.research.google.com/drive/1ap_bl7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb_Ganj5V&printMode=true) 103/270

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```
Window 88000-88050: Predictions: [ 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]  
Window 88050-88100: Predictions: [ 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]  
Window 88100-88150: Predictions: [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]  
Window 88150-88200: Predictions: [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]  
Window 88200-88250: Predictions: [ 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]  
Window 88250-88300: Predictions: [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]  
Window 88300-88350: Predictions: [ 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]  
Window 88350-88400: Predictions: [ 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]  
Window 88400-88450: Predictions: [ 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]  
Window 88450-88500: Predictions: [ 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]  
Window 88500-88550: Predictions: [ 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]
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```
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
Window 90500-90550: Predictions: [ 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]
Window 90550-90600: Predictions: [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]
Window 90600-90650: Predictions: [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]
Window 90650-90700: Predictions: [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]
Window 90700-90750: Predictions: [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]
Window 90750-90800: Predictions: [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]
Window 90800-90850: Predictions: [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]
Window 90850-90900: Predictions: [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]
Window 90900-90950: Predictions: [ 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]
Window 90950-91000: Predictions: [ 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]
Window 91000-91050: Predictions: [ 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]
Window 91050-91100: Predictions: [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]
Window 91100-91150: Predictions: [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]
Window 91150-91200: Predictions: [ 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]
Window 91200-91250: Predictions: [ 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]
Window 91250-91300: Predictions: [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]
Window 91300-91350: Predictions: [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]
Window 91350-91400: Predictions: [ 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]
Window 91400-91450: Predictions: [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]
Window 91450-91500: Predictions: [ 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 -1
```

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111/270

```
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest requires features with names. Please provide a list of features via the `feature_names` parameter or rename the columns in your dataset.
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest requires features with names. Please provide a list of features via the `feature_names` parameter or rename the columns in your dataset.
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest requires features with names. Please provide a list of features via the `feature_names` parameter or rename the columns in your dataset.
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest requires features with names. Please provide a list of features via the `feature_names` parameter or rename the columns in your dataset.
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest requires features with names. Please provide a list of features via the `feature_names` parameter or rename the columns in your dataset.
warnings.warn(
```





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[illegible]

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[illegible]

[illegible]

```

/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(

```

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[illegible]

```
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest requires features with names to compute the feature importance. You can provide a list of feature names to avoid this warning.
```

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[illegible]

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[illegible]



```
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest requires feature names to be provided.
  warnings.warn(
```

[illegible]





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[https://colab.research.google.com/drive/1ap\\_bI7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb\\_Gani5V&printMode=true](https://colab.research.google.com/drive/1ap_bI7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb_Gani5V&printMode=true) 152/270



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```
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
Window 133050-133100: Predictions: [ 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]
Window 133100-133150: Predictions: [ 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]
Window 133150-133200: Predictions: [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]
Window 133200-133250: Predictions: [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]
Window 133250-133300: Predictions: [ 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]
Window 133300-133350: Predictions: [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]
Window 133350-133400: Predictions: [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]
Window 133400-133450: Predictions: [ 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]
Window 133450-133500: Predictions: [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]
Window 133500-133550: Predictions: [ 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]
Window 133550-133600: Predictions: [ 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]
Window 133600-133650: Predictions: [ 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]
Window 133650-133700: Predictions: [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]
Window 133700-133750: Predictions: [ 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]
Window 133750-133800: Predictions: [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]
Window 133800-133850: Predictions: [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]
Window 133850-133900: Predictions: [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]
Window 133900-133950: Predictions: [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]
Window 133950-134000: Predictions: [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]
Window 134000-134050: Predictions: [ 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
```

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[https://colab.research.google.com/drive/1ap\\_bl7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb\\_Ganj5V&printMode=true](https://colab.research.google.com/drive/1ap_bl7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb_Ganj5V&printMode=true) 167/270

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[illegible]

[illegible]

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[https://colab.research.google.com/drive/1ap\\_bI7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb\\_Gani5V&printMode=true](https://colab.research.google.com/drive/1ap_bI7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb_Gani5V&printMode=true) 176/270



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```

/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(

```

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[https://colab.research.google.com/drive/1ap\\_bl7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb\\_Gani5V&printMode=true](https://colab.research.google.com/drive/1ap_bl7X4P-DYgpzXGEullrgVizcuD45r?authuser=4#scrollTo=3TLPb_Gani5V&printMode=true) 184/270



```
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but Isolatic
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but Isolatic
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but Isolatic
warnings.warn(
Window 158950-159000: Predictions: [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]
Window 159000-159050: Predictions: [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]
Window 159050-159100: Predictions: [ 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]
Window 159100-159150: Predictions: [ 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]
Window 159150-159200: Predictions: [ 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]
Window 159200-159250: Predictions: [ 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]
Window 159250-159300: Predictions: [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]
Window 159300-159350: Predictions: [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]
Window 159350-159400: Predictions: [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]
Window 159400-159450: Predictions: [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]
Window 159450-159500: Predictions: [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]
Window 159500-159550: Predictions: [ 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]
Window 159550-159600: Predictions: [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]
Window 159600-159650: Predictions: [ 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]
Window 159650-159700: Predictions: [ 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]
Window 159700-159750: Predictions: [ 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]
Window 159750-159800: Predictions: [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]
Window 159800-159850: Predictions: [ 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]
Window 159850-159900: Predictions: [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]
Window 159900-159950: Predictions: [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]
Window 159950-160000: Predictions: [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]
Window 160000-160050: Predictions: [ 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]
Window 160050-160100: Predictions: [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]
Window 160100-160150: Predictions: [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]
Window 160150-160200: Predictions: [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]
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but Isolatic
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but Isolatic
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but Isolatic
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but Isolatic
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but Isolatic
warnings.warn(
```

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```
Window 164050-164100: Predictions: [ 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]
Window 164100-164150: Predictions: [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]
Window 164150-164200: Predictions: [ 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]
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
Window 164200-164250: Predictions: [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]
Window 164250-164300: Predictions: [ 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]
Window 164300-164350: Predictions: [-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]
Window 164350-164400: Predictions: [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]
Window 164400-164450: Predictions: [ 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]
Window 164450-164500: Predictions: [ 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]
Window 164500-164550: Predictions: [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]
Window 164550-164600: Predictions: [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]
Window 164600-164650: Predictions: [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]
Window 164650-164700: Predictions: [ 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]
Window 164700-164750: Predictions: [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]
Window 164750-164800: Predictions: [ 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]
```

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```
1 1 1 1 1 1 1 1 1 1 1 1 1 1]
Window 174800-174850: Predictions: [ 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]
Window 174850-174900: Predictions: [ 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]
Window 174900-174950: Predictions: [ 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]
Window 174950-175000: Predictions: [ 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]
Window 175000-175050: Predictions: [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]
Window 175050-175100: Predictions: [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]
Window 175100-175150: Predictions: [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]
Window 175150-175200: Predictions: [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]
Window 175200-175250: Predictions: [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]
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
Window 175250-175300: Predictions: [ 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]
Window 175300-175350: Predictions: [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]
Window 175350-175400: Predictions: [ 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]
```

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```
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest requires them to be provided as strings. Please use the `feature_names` parameter to provide feature names.
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest requires them to be provided as strings. Please use the `feature_names` parameter to provide feature names.
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest requires them to be provided as strings. Please use the `feature_names` parameter to provide feature names.
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest requires them to be provided as strings. Please use the `feature_names` parameter to provide feature names.
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest requires them to be provided as strings. Please use the `feature_names` parameter to provide feature names.
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest requires them to be provided as strings. Please use the `feature_names` parameter to provide feature names.
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest requires them to be provided as strings. Please use the `feature_names` parameter to provide feature names.
warnings.warn(
```



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```

/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
warnings.warn(

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```

/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but IsolationForest
  warnings.warn(

```

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[illegible]

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```
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but Isolat
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but Isolat
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/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but Isolat
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warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but Isolat
warnings.warn(
Window 224750-224800: Predictions: [ 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]
Window 224800-224850: Predictions: [ 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]
Window 224850-224900: Predictions: [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]
Window 224900-224950: Predictions: [ 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]
Window 224950-225000: Predictions: [ 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]
Window 225000-225050: Predictions: [ 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]
Window 225050-225100: Predictions: [ 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]
Window 225100-225150: Predictions: [ 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]
Window 225150-225200: Predictions: [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]
Window 225200-225250: Predictions: [ 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]
Window 225250-225300: Predictions: [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]
Window 225300-225350: Predictions: [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]
Window 225350-225400: Predictions: [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]
Window 225400-225450: Predictions: [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]
Window 225450-225500: Predictions: [ 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]
Window 225500-225550: Predictions: [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]
Window 225550-225600: Predictions: [ 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]
Window 225600-225650: Predictions: [ 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]
Window 225650-225700: Predictions: [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]
Window 225700-225750: Predictions: [ 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]
Window 225750-225800: Predictions: [ 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]
Window 225800-225850: Predictions: [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]
Window 225850-225900: Predictions: [ 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]
Window 225900-225950: Predictions: [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]
Window 225950-226000: Predictions: [ 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]
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but Isolat
warnings.warn(
/usr/local/lib/python3.10/dist-packages/sklearn/utils/validation.py:2739: UserWarning: X does not have valid feature names, but Isolat
```

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