**6. Implement program to apply moving average smoothing for data preparation and time series forecasting.**

**AIM:**

Implement program to apply moving average smoothing for data preparation and time series forecasting.

**PROCEDURE:**

**1.**Import the necessary libraries:

import numpy as np

import pandas as pd

import matplotlib.pyplot as plt

**2.** Load the dataset :

file\_path = "/content/autism\_screening.csv" *# Update with actual file path*

df = pd.read\_csv(file\_path)

**3.**Ensure relevant columns exist.

required\_columns = {'age', 'class/asd'}

if not required\_columns.issubset(df.columns):

raise ValueError(f"Dataset is missing required columns: {required\_columns - set(df.columns)}")

**4.** Apply Moving Average Smoothing AND Split into train and test sets (80% train, 20% test)

window\_size = 5 *# Adjust window size as needed*

df\_agg["Moving\_Avg"] = df\_agg["class/asd"].rolling(window=window\_size, center=True).mean()

split\_idx = int(len(df\_agg) \* 0.8)

train = df\_agg.iloc[:split\_idx]

test = df\_agg.iloc[split\_idx:]

**5.** Forecast using Moving Average

forecast = train["Moving\_Avg"].iloc[-window\_size:].mean()

test["Forecast"] = forecast *# Apply same forecast to all test points*

**6.**Plotting the result:

plt.figure(figsize=(12, 6))

*# Original data*

plt.plot(df\_agg["age"], df\_agg["class/asd"], marker="o", linestyle="-", alpha=0.6, label="Original Data")

*# Moving Average Smoothed Data*

plt.plot(df\_agg["age"], df\_agg["Moving\_Avg"], color="blue", linewidth=2, label="Moving Average Smoothing")

*# Forecasted values*

plt.plot(test["age"], test["Forecast"], color="red", linestyle="--", linewidth=2, label="Forecast (Moving Avg)")

*# Labels & legend*

plt.xlabel("Age")

plt.ylabel("Mean ASD Score")

plt.title("Moving Average Smoothing & Forecasting")

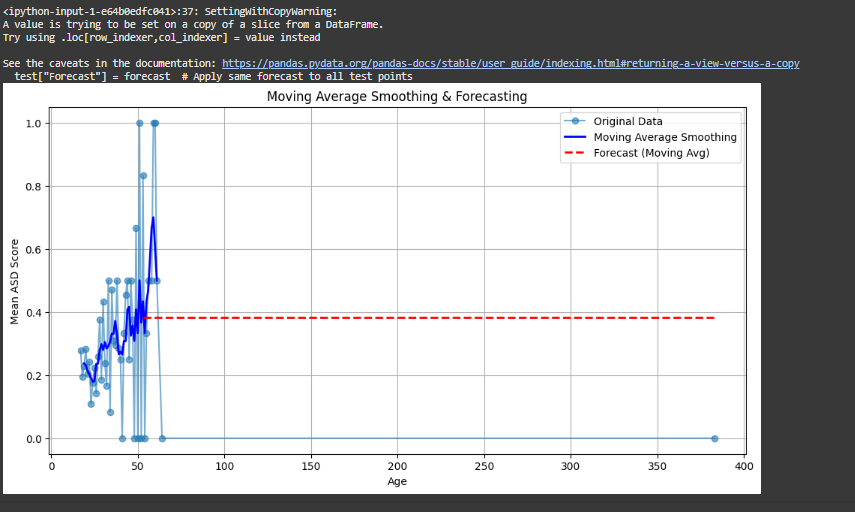
plt.legend()

plt.grid(True)

*# Show plot*

plt.show()

**OUTPUT**

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**RESULT:**

The program to implement to apply moving average smoothing on the autism screening dataset has been implemented successfully.