TIME SERIES ANAYSIS AND FORECASTING

EX:2

AIM:TO IMPLEMENTPROGRAM FROM VISUAIZATION TIME SERIES DATE

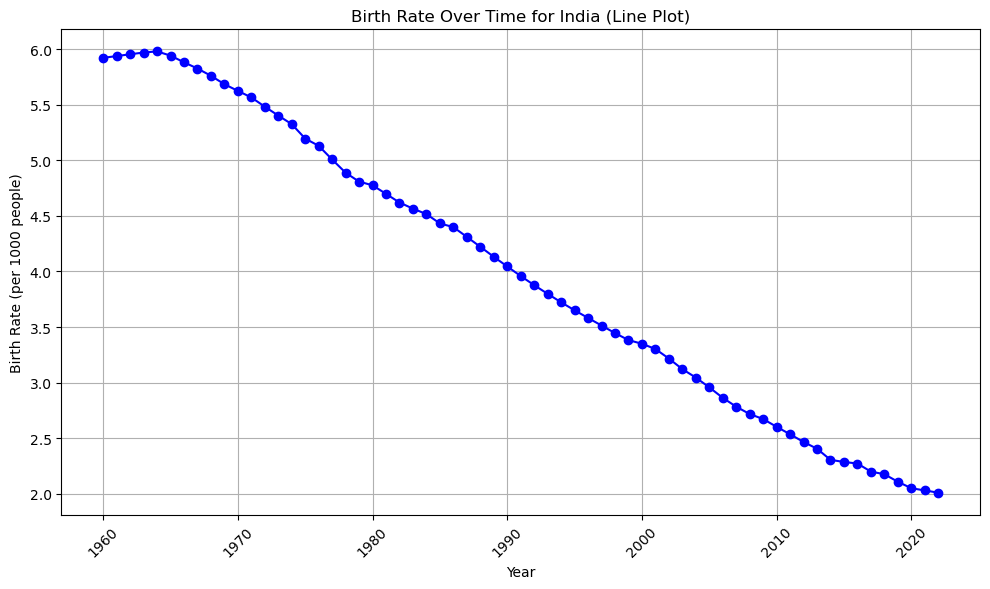
#data cleaning and loading  
  
import pandas as pd  
file\_path = r"C:\Users\admin\Downloads\API\_SP.DYN.TFRT.IN\_DS2\_EN\_csv\_v2\_162\API\_SP.DYN.TFRT.IN\_DS2\_EN\_csv\_v2\_162.csv"  
df = pd.read\_csv(file\_path, delimiter=',', skiprows=4, on\_bad\_lines='skip')  
df.columns = df.columns.str.replace('"', '').str.strip()  
print("Cleaned Column Names:")  
print(df.columns)

Cleaned Column Names:  
Index(['Country Name', 'Country Code', 'Indicator Name', 'Indicator Code',  
 '1960', '1961', '1962', '1963', '1964', '1965', '1966', '1967', '1968',  
 '1969', '1970', '1971', '1972', '1973', '1974', '1975', '1976', '1977',  
 '1978', '1979', '1980', '1981', '1982', '1983', '1984', '1985', '1986',  
 '1987', '1988', '1989', '1990', '1991', '1992', '1993', '1994', '1995',  
 '1996', '1997', '1998', '1999', '2000', '2001', '2002', '2003', '2004',  
 '2005', '2006', '2007', '2008', '2009', '2010', '2011', '2012', '2013',  
 '2014', '2015', '2016', '2017', '2018', '2019', '2020', '2021', '2022',  
 '2023', 'Unnamed: 68'],  
 dtype='object')

#Handling & Preprocessing  
  
df\_long = pd.melt(df[['Country Name'] + [str(year) for year in range(1960, 2024)]],   
 id\_vars=["Country Name"], var\_name="Year", value\_name="Birth Rate")  
df\_long['Year'] = pd.to\_numeric(df\_long['Year'])  
df\_long['Birth Rate'] = pd.to\_numeric(df\_long['Birth Rate'], errors='coerce')  
df\_long.dropna(subset=['Birth Rate'], inplace=True)  
print(df\_long.head())

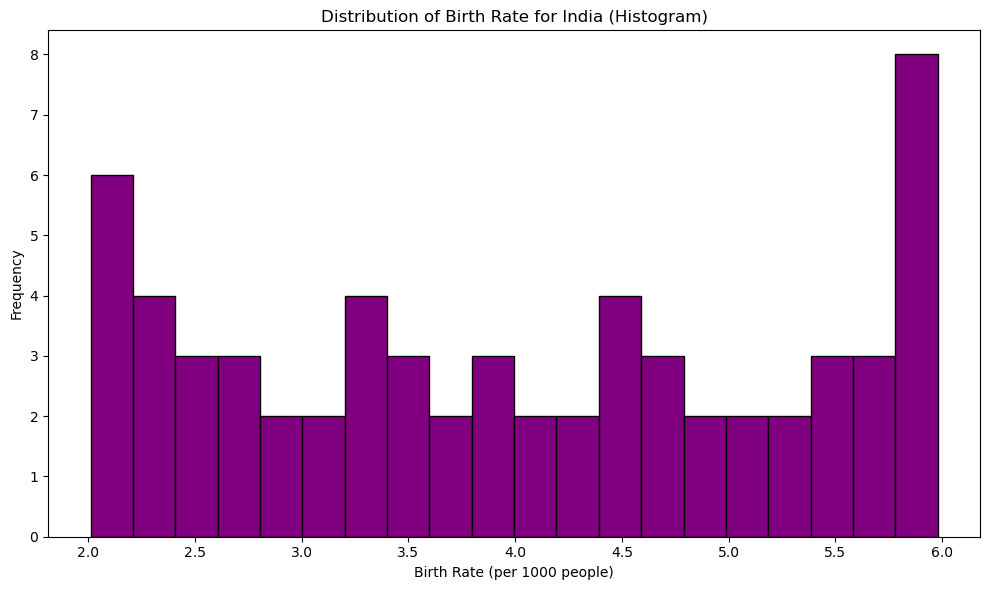
Country Name Year Birth Rate  
0 Aruba 1960 4.820000  
1 Africa Eastern and Southern 1960 6.723226  
2 Afghanistan 1960 7.282000  
3 Africa Western and Central 1960 6.459063  
4 Angola 1960 6.708000

#Visualization (Line plot)  
df\_country = df\_long[df\_long['Country Name'] == 'India']  
plt.figure(figsize=(10, 6))  
plt.plot(df\_country['Year'], df\_country['Birth Rate'], marker='o', color='b')  
plt.title('Birth Rate Over Time for India (Line Plot)')  
plt.xlabel('Year')  
plt.ylabel('Birth Rate (per 1000 people)')  
plt.grid(True)  
plt.xticks(rotation=45)  
plt.tight\_layout()  
plt.show()



# Bar plot  
  
plt.figure(figsize=(10, 6))  
plt.bar(df\_country['Year'], df\_country['Birth Rate'], color='orange')  
plt.title('Birth Rate Over Time for India (Bar Plot)')  
plt.xlabel('Year')  
plt.ylabel('Birth Rate (per 1000 people)')  
plt.xticks(rotation=45)  
plt.tight\_layout()  
plt.show()

# Box plot  
# Histogram (distribution of birth rates)  
plt.figure(figsize=(10, 6))  
plt.hist(df\_country['Birth Rate'], bins=20, color='purple', edgecolor='black')  
plt.title('Distribution of Birth Rate for India (Histogram)')  
plt.xlabel('Birth Rate (per 1000 people)')  
plt.ylabel('Frequency')  
plt.tight\_layout()  
plt.show()



plt.figure(figsize=(10, 6))  
plt.boxplot(df\_country['Birth Rate'], vert=False)  
plt.title('Birth Rate Distribution for India (Box Plot)')  
plt.xlabel('Birth Rate (per 1000 people)')  
plt.tight\_layout()  
plt.show()

RESULT:THE PROGRAM HAS BEEN SUCESSFULLY EXECUTED

