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import pandas as pd
import numpy as np

# 1. Reading Data from a File
# Create a sample DataFrame and save it to a CSV file for demonstration
data = {
    'Name': ['Hari', 'Anu', 'Mouli', 'Anki', np.nan],
    'Age': [25, np.nan, 35, 45, 55],
    'Salary': [50000, 60000, 70000, np.nan, 90000],
    'Gender': ['M', 'F', 'M', 'F', np.nan]
}
df = pd.DataFrame(data)

# Save the DataFrame to a CSV file
df.to_csv('sample_data.csv', index=False)

# Read the data back from the CSV file
df = pd.read_csv('sample_data.csv')

print("Original DataFrame:\n", df)

# 2. Handling Missing Data

# a. Fill missing values with specified values or methods
df['Age'].fillna(df['Age'].mean(), inplace=True) # Fill missing Age with the mean age
df['Salary'].fillna(df['Salary'].median(), inplace=True) # Fill missing Salary with the median salary

# b. Drop rows with any missing values in 'Name' or 'Gender'
df.dropna(subset=['Name', 'Gender'], inplace=True)

print("\nDataFrame after handling missing values:\n", df)

# 3. Data Transformation

# a. Add a new column 'Annual Income' by transforming 'Salary' column
df['Annual Income'] = df['Salary'] * 12

# b. Create a 'Senior Citizen' column based on Age
df['Senior Citizen'] = df['Age'].apply(lambda x: 'Yes' if x >= 60 else 'No')

print("\nDataFrame after data transformations:\n", df)

# Save the transformed DataFrame to a new CSV file
df.to_csv('transformed_data.csv', index=False)

```



Original DataFrame:

	Name	Age	Salary	Gender
0	Hari	25.0	50000.0	M
1	Anu	NaN	60000.0	F
2	Mouli	35.0	70000.0	M