import pandas as pd  
  
# Exercise 5: Handling Missing Values\*\*  
# 1. Create a DataFrame with missing values:  
  
data = {  
 "Name": ["Amit", "Neha", "Raj", "Priya"],  
 "Age": [28, None, 35, 29],  
 "City": ["Delhi", "Mumbai", None, "Chennai"]  
 }  
df = pd.DataFrame(data)  
  
# 2. Fill missing values in the `"Age"` column with the average age.  
mean\_age = df["Age"].mean()  
df["Age"] = df["Age"].fillna(mean\_age)  
print(df)  
# 3. Drop rows where any column has missing data.  
df\_clean = df.dropna()  
print(df\_clean)  
  
# Exercise 6: Adding and Removing Columns\*\*  
# 1. Add a new column `"Salary"` with the following values: `[50000, 60000, 70000, 65000]`.  
df["Salary"] = [50000, 60000, 70000, 65000]  
# 2. Remove the `"City"` column from the DataFrame.  
df\_dropped = df.drop(columns=["City"])  
print(df\_dropped)  
  
# Exercise 7: Sorting Data\*\*  
# 1. Sort the DataFrame by `"Age"` in ascending order.  
print(df.sort\_values(by="Age",ascending=True))  
# 2. Sort the DataFrame first by `"City"` and then by `"Age"` in descending order.  
print(df.sort\_values(by=["City","Age"],ascending=[False,False]))  
  
# Exercise 8: Grouping and Aggregation\*\*  
# 1. Group the DataFrame by `"City"` and calculate the average `"Age"` for each city.  
  
df\_grouped\_city = df.groupby("City")["Age"].mean()  
print(df\_grouped\_city)  
  
# 2. Group the DataFrame by `"City"` and `"Age"`, and count the number of occurrences for each group.  
  
df\_grouped\_city\_age = df.groupby(["City","Age"]).size()  
print(df\_grouped\_city\_age)  
  
# Exercise 9: Merging DataFrames\*\*  
# 1. Create two DataFrames:  
  
df1 = pd.DataFrame({  
 "Name": ["Amit", "Neha", "Raj"],  
 "Department": ["HR", "IT", "Finance"]  
 })  
  
df2 = pd.DataFrame({  
 "Name": ["Neha", "Raj", "Priya"],  
 "Salary": [60000, 70000, 65000]  
 })  
# 2. Merge `df1` and `df2` on the `"Name"` column using an inner join.  
df\_merge = pd.merge(df1,df2,on="Name",how="inner")  
print(df\_merge)  
  
# 3. Merge the same DataFrames using a left join  
  
df\_merge\_left = pd.merge(df1,df2,on="Name",how="left")  
print(df\_merge\_left)