In [14]:
```python
#lab17q1 a
import pandas as pd
data = {
    'Employee': ['Eva', 'Labi', 'Bob', 'Manya'],
    'Department': ['IT', 'HR', 'Finance', 'IT'],
    'Salary': [50000, 50000, 70000, 72000],
    'Age': [30, 28, 35, 32]
}
df = pd.DataFrame(data)
print("First two rows of the DataFrame:")
print(df.head(2))
df['Experience'] = [6, 4, 8, 6]
print("\nDataFrame with 'Experience' column:")
print(df)
average_salary = df['Salary'].mean()
print(f"\nAverage salary of all employees: {average_salary}")
```

```
First two rows of the DataFrame:
  Employee Department  Salary  Age
0      Eva         IT   50000   30
1     Labi         HR   50000   28

DataFrame with 'Experience' column:
  Employee Department  Salary  Age  Experience
0      Eva         IT   50000   30           6
1     Labi         HR   50000   28           4
2      Bob    Finance   70000   35           8
3    Manya         IT   72000   32           6

Average salary of all employees: 60500.0
```

In [16]:
```python
#q1 b
import pandas as pd
data = {'Name': ['Alice', 'Bob', 'Charlie', 'David', 'Eve'],
           'Math': [90, 80, 92, 75, 95],
           'Science': [80, 99, 68, 90, 82],
           'English': [90, 75, 75, 80, 92]}
df = pd.DataFrame(data)
print("Created DataFrame:\n", df)
math_high_scores = df[df['Math'] > 80]  #1
print("\nStudents who scored more than 80 in Math:\n", math_high_scores)
sorted_science = df.sort_values(by='Science', ascending=False) #2
print("\nDataFrame sorted by Science scores (descending):\n", sorted_science)
highest_english_score = df.loc[df['English'].idxmax()] #3
print("\nStudent with the highest English score:\n", highest_english_score)
```

```
Created DataFrame:
      Name  Math  Science  English
0    Alice    90       80       90
1      Bob    80       99       75
2  Charlie    92       68       75
3    David    75       90       80
4      Eve    95       82       92

Students who scored more than 80 in Math:
      Name  Math  Science  English
0    Alice    90       80       90
2  Charlie    92       68       75
4      Eve    95       82       92

DataFrame sorted by Science scores (descending):
      Name  Math  Science  English
1      Bob    80       99       75
3    David    75       90       80
4      Eve    95       82       92
0    Alice    90       80       90
2  Charlie    92       68       75

Student with the highest English score:
 Name       Eve
Math        95
Science     82
English     92
Name: 4, dtype: object
```

In [32]:
```python
#lab17q2
import pandas as pd
categories = ['Groceries', 'Utilities', 'Rent', 'Transportation', 'Entertainment']
expenses = [500, 100, 1000, 200, 200]
expense_series = pd.Series(expenses, index=categories, name="Monthly Expenses")
print(expense_series)
total_expenses = expense_series.sum()
print(f"Total Monthly Expenses: {total_expenses}")
```

```
Groceries          500
Utilities          100
Rent              1000
Transportation     200
Entertainment      200
Name: Monthly Expenses, dtype: int64
Total Monthly Expenses: 2000
```

In [28]:
```python
#lab17q3
import pandas as pd
months = ['January', 'February', 'March', 'April', 'May', 'June', 'July', 'August',
          'September', 'October', 'November', 'December']
electricity_usage = [350, 320, 310, 330, 340, 370, 380, 360, 350, 330, 320, 330]
gas_usage = [20, 18, 16, 15, 12, 10, 8, 9, 12, 15, 17, 19]
electricity_series = pd.Series(electricity_usage, index=months, name="Electricity (
gas_series = pd.Series(gas_usage, index=months, name="Gas (therms)")
print(electricity_series)
print(gas_series)
```

```
January      350
February     320
March        310
April        330
May          340
June         370
July         380
August       360
September    350
October      330
November     320
December     330
Name: Electricity (kWh), dtype: int64
January      20
February     18
March        16
April        15
May          12
June         10
July          8
August        9
September    12
October      15
November     17
December     19
Name: Gas (therms), dtype: int64
```

In [38]:
```python
#lab17q4
import pandas as pd
months = ['January', 'February', 'March', 'April', 'May', 'June', 'July', 'August',
          'September', 'October', 'November', 'December']
revenue = [4000, 5200, 5000, 5400, 5600, 5800, 6100, 5900, 6200, 6500, 7000, 8900]
revenue_series = pd.Series(revenue, index=months, name="Monthly Advertising Revenue
print(revenue_series)
total_revenue = revenue_series.sum()
print(f"Total Annual Advertising Revenue: ${total_revenue}")
```

```
January      4000
February     5200
March        5000
April        5400
May          5600
June         5800
July         6100
August       5900
September    6200
October      6500
November     7000
December     8900
Name: Monthly Advertising Revenue, dtype: int64
Total Annual Advertising Revenue: $71600
```

In [ ]: