In [11]:
```
#1.a.Dataframe creation and basic operations
import pandas as pd
data = {
    'Employee': ['John', 'Alice', 'Bob', 'Emma'],
    'Department': ['IT', 'HR', 'Finance', 'IT'],
    'Salary': [60000, 55000, 70000, 72000],
    'Age': [30, 28, 35, 32]
}
df = pd.DataFrame(data)
print("First two rows of the DataFrame:")
print(df.head(2))
df['Experience'] = [5, 3, 7, 6]
average_salary = df['Salary'].mean()
print("\nAverage Salary of all employees:", average_salary)
```

```
First two rows of the DataFrame:
  Employee Department  Salary  Age
0     John         IT   60000   30
1    Alice         HR   55000   28

Average Salary of all employees: 64250.0
```

In [13]:
```
#b.Create dataset of students with name and 3 subjects
students = {
    'Name': ['Alice', 'Bob', 'Charlie', 'David', 'Eva'],
    'Math': [85, 78, 92, 65, 88],
    'Science': [91, 89, 75, 80, 85],
    'English': [78, 88, 85, 82, 90]
}
student_df = pd.DataFrame(students)
print("\nStudents who scored more than 80 in Math:")
print(student_df[student_df['Math'] > 80])
print("\nStudents sorted by Science scores (descending):")
print(student_df.sort_values(by='Science', ascending=False))
top_english = student_df.loc[student_df['English'].idxmax()]
print("\nStudent with highest English score:")
print(top_english)
```

```
Students who scored more than 80 in Math:
      Name  Math  Science  English
0    Alice    85       91       78
2  Charlie    92       75       85
4      Eva    88       85       90

Students sorted by Science scores (descending):
      Name  Math  Science  English
0    Alice    85       91       78
1      Bob    78       89       88
4      Eva    88       85       90
3    David    65       80       82
2  Charlie    92       75       85

Student with highest English score:
Name       Eva
Math        88
Science     85
English     90
Name: 4, dtype: object
```

2: Suppose you want to track and analyze your household expenses for a month. You have recorded the expenses for various categories, such as groceries, utilities, rent, transportation, and entertainment. You can represent this expense data using a Pandas Series.

In [16]:
```
import pandas as pd
categories = ['Groceries', 'Utilities', 'Rent', 'Transportation', 'Entertainment']
expenses = [500, 200, 1200, 300, 150]
expense_series = pd.Series(data=expenses, index=categories)
print("Monthly Household Expenses:")
print(expense_series)
```

```
Monthly Household Expenses:
Groceries          500
Utilities          200
Rent              1200
Transportation     300
Entertainment      150
dtype: int64
```

3: Suppose you want to track and analyze the monthly energy consumption in your home. You have recorded the monthly energy usage for electricity and gas over a year, and you want to represent this data using Pandas Series.

In [19]:
```
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(data=electricity_usage, index=months)
gas_series = pd.Series(data=gas_usage, index=months)
print("Monthly Electricity Usage (kWh):")
print(electricity_series)
print("\nMonthly Gas Usage (therms):")
print(gas_series)
```

```
Monthly Electricity Usage (kWh):
January      350
February     320
March        310
April        330
May          340
June         370
July         380
August       360
September    350
October      330
November     320
December     330
dtype: int64

Monthly Gas Usage (therms):
January      20
February     18
March        16
April        15
May          12
June         10
July          8
August        9
September    12
October      15
November     17
December     19
dtype: int64
```

4:Suppose you are managing a website and want to analyze the monthly revenue generated from advertising. You have recorded the monthly revenue for the past year, and you want to represent this data using a Pandas Series.

In [22]:
```
import pandas as pd
months = ['January', 'February', 'March', 'April', 'May', 'June',
          'July', 'August', 'September', 'October', 'November', 'December']
revenue = [5000, 5200, 4800, 5400, 5600, 5800, 6100, 5900, 6200, 6500, 7000, 6900]
revenue_series = pd.Series(data=revenue, index=months)
print("Monthly Advertising Revenue:")
print(revenue_series)
```

```
Monthly Advertising Revenue:
January      5000
February     5200
March        4800
April        5400
May          5600
June         5800
July         6100
August       5900
September    6200
October      6500
November     7000
December     6900
dtype: int64
```

In [ ]: