Dictionaries & Tuples & List Exercises

Exercise 1: Student Grades Analysis

Data:

```
students = {
    "Alice": [85, 78, 92],
    "Bob": [79, 74, 81],
    "Charlie": [91, 82, 85],
    "David": [76, 85, 83],
    "Eve": [88, 79, 92]
}
```

Tasks:

1. Calculate and print the average score for each student.
2. Find and print the name of the student with the highest average score.
3. Find and print the name of the student with the lowest average score.
4. Add a new student "Frank" with scores [80, 90, 85] to the dictionary and print the updated dictionary.

Exercise 2: Product Inventory Management

Data:

```
inventory = {
    "apple": (50, 0.5),
    "banana": (100, 0.2),
    "orange": (75, 0.3),
    "pear": (20, 0.4)
}
```

Tasks:

1. Print the current inventory in a user-friendly format.
2. Calculate and print the total value of the inventory.
3. Add a new product "mango" with 30 items priced at $0.6 each to the inventory.
4. Update the quantity of "banana" to 120 and print the updated inventory.
5. Remove "pear" from the inventory and print the updated inventory.

Exercise 3: Employee Records

Data:

```
employees = [
    ("John Doe", "Accounting", "john.doe@example.com"),
    ("Jane Smith", "Marketing", "jane.smith@example.com"),
    ("Emily Davis", "HR", "emily.davis@example.com"),
    ("Michael Brown", "IT", "michael.brown@example.com")
]
```

Tasks:

1. Print the names and departments of all employees.
2. Print the email addresses of all employees in alphabetical order by their last names.
3. Add a new employee ("David Wilson", "Sales", "david.wilson@example.com") and print the updated list.
4. Find and print the department of "Jane Smith".

Exercise 4: Book Library System

Data:

```
library = {
    "978-3-16-148410-0": {"title": "The Catcher in the Rye",
"author": "J.D. Salinger", "year": 1951},
```

```
    "978-0-14-028329-7": {"title": "1984", "author": "George
Orwell", "year": 1949},
    "978-0-7432-7356-5": {"title": "To Kill a Mockingbird",
"author": "Harper Lee", "year": 1960},
    "978-0-452-28423-4": {"title": "Brave New World", "autho
r": "Aldous Huxley", "year": 1932}
}
```

Tasks:

1. Print the details of all books in a user-friendly format.
2. Find and print the details of the book with the ISBN "978-0-14-028329-7".
3. Add a new book with ISBN "978-1-4028-9462-6", title "The Great Gatsby", author "F. Scott Fitzgerald", and year 1925.
4. Update the year of "To Kill a Mockingbird" to 1961 and print the updated details.
5. Remove the book with ISBN "978-0-452-28423-4" and print the updated library.

Exercise 5: City Population Data

Data:

```
cities = {
    "New York": 8419000,
    "Los Angeles": 3980000,
    "Chicago": 2716000,
    "Houston": 2328000,
    "Phoenix": 1690000
}
```

Tasks:

1. Print the population of each city in a user-friendly format.
2. Find and print the city with the highest population.

3. Find and print the city with the lowest population.
4. Update the population of "Phoenix" to 1700000 and print the updated data.
5. Add a new city "San Francisco" with a population of 884000 and print the updated data.

Exercise 6: Movie Database

Data:

```
movies = {
    "Inception": {"year": 2010, "rating": 8.8, "genre": "Sci-
Fi"},
    "The Godfather": {"year": 1972, "rating": 9.2, "genre":
"Crime"},
    "The Dark Knight": {"year": 2008, "rating": 9.0, "genre":
"Action"},
    "Pulp Fiction": {"year": 1994, "rating": 8.9, "genre": "C
rime"},
    "Forrest Gump": {"year": 1994, "rating": 8.8, "genre": "D
rama"}
}
```

Tasks:

1. Print the details of all movies in a user-friendly format.
2. Find and print the highest-rated movie.
3. Add a new movie "The Matrix" with year 1999, rating 8.7, and genre "Sci-Fi" to the database.
4. Update the rating of "Inception" to 9.0 and print the updated details.
5. Remove "Pulp Fiction" from the database and print the updated list.

Exercise 7: Country Capitals

Data:

```
countries = {
    "USA": "Washington, D.C.",
    "Canada": "Ottawa",
    "France": "Paris",
    "Germany": "Berlin",
    "Japan": "Tokyo"
}
```

Tasks:

1. Print the names of all countries and their capitals.
2. Find and print the capital of Germany.
3. Add a new country "Australia" with capital "Canberra" to the dictionary and print the updated dictionary.
4. Update the capital of "USA" to "New Washington" and print the updated dictionary.
5. Remove "France" from the dictionary and print the updated dictionary.

Exercise 8: Shopping Cart

Data:

```
cart = [
    {"item": "apple", "quantity": 3, "price_per_unit": 0.5},
    {"item": "banana", "quantity": 6, "price_per_unit": 0.2},
    {"item": "orange", "quantity": 4, "price_per_unit": 0.3},
    {"item": "pear", "quantity": 2, "price_per_unit": 0.4}
]
```

Tasks:

1. Print the details of all items in the cart.
2. Calculate and print the total cost of the cart.
3. Add a new item "grape" with quantity 5 and price per unit 0.6 to the cart.

4. Update the quantity of "banana" to 10 and print the updated cart.
5. Remove "pear" from the cart and print the updated cart.

Exercise 9: Weather Data

Data:

```
weather = {
    "Monday": {"temperature": 20, "humidity": 60},
    "Tuesday": {"temperature": 22, "humidity": 55},
    "Wednesday": {"temperature": 19, "humidity": 65},
    "Thursday": {"temperature": 23, "humidity": 50},
    "Friday": {"temperature": 21, "humidity": 70}
}
```

Tasks:

1. Print the weather details for each day.
2. Find and print the day with the highest temperature.
3. Find and print the day with the lowest humidity.
4. Update the temperature of "Wednesday" to 25 and print the updated weather data.
5. Add weather data for "Saturday" with temperature 24 and humidity 60 to the dictionary and print the updated weather data.

Exercise 10: Library Members

Data:

```
members = [
    {"name": "Alice", "age": 25, "books_borrowed": ["1984",
"To Kill a Mockingbird"]},
    {"name": "Bob", "age": 30, "books_borrowed": ["The Catche
r in the Rye"]},
    {"name": "Charlie", "age": 22, "books_borrowed": ["Brave
New World", "1984"]},
```

```
    {"name": "David", "age": 35, "books_borrowed": ["The Grea
t Gatsby"]}
]
```

Tasks:

1. Print the names and ages of all members.
2. Find and print the books borrowed by "Charlie".
3. Add a new member "Eve" with age 28 and books borrowed ["Pride and Prejudice"] to the list.
4. Update the age of "Bob" to 31 and print the updated list.
5. Remove "David" from the list and print the updated list.