Python Programming Language

Dictionaries

Exercises

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Question 1

- **Exercise 1: Generating and Storing User Profiles**
- **Objective**: Create a script that generates a specified number of fake user profiles and saves them in a JSON file.
- **Tasks**:
  1. Install and import the faker library.
  2. Write a function to generate a single user profile containing fields like name, address, email, and birthdate.
  3. Generate 10 user profiles and store them in a list of dictionaries.
  4. Use json.dump() to write this list to a file named user_profiles.json.

- **Exercise 2: Manipulating and Filtering Data**
- **Objective**: Read the generated JSON file from Exercise 1, and filter out profiles based on a specific criterion.
- **Tasks**:
    1. Read user_profiles.json using json.load().
    2. Write a function to filter profiles where the user's birth year is after 1990.
    3. Print or save the filtered list to a new JSON file.

- **Exercise 3: Data Transformation**
- **Objective**: Transform the structure of the JSON data.
- **Tasks**:
    1. Load the user profiles from user_profiles.json.
    2. Transform the data so that each user profile is keyed by the user's email address.
    3. Save the transformed data back to a new JSON file.

- **Exercise 4: Combining faker with Real-world Scenarios**
- **Objective**: Simulate a real-world scenario, such as generating data for a fake e-commerce site.
- **Tasks**:
    1. Generate data for products, including product name, price, and category.
    2. Create fake customer data, including their purchase history with the generated products.
    3. Save this information in a structured JSON format.

- **Exercise 5: Advanced Data Generation and Analysis**
- **Objective**: Create a more complex data set and perform basic analysis.
- **Tasks**:
  1. Generate a data set of fake medical records using faker.
  2. Each record should include patient details, doctor's name, visit date, and diagnosis.
  3. Load the data into Python and perform basic analysis, like counting the number of visits per month.

Question 2

- Create a data NorthernIrelandPopulation. Each element of the data should hold the population of each county in Northern Ireland.
- Given that counties Antrim, Armagh, Down, Fermanagh, Londonderry, and Tyrone has a population ratio of Male to Female, 45:55, 65:35, 48:52, 40:60, 50:50, and 25:75 respectively. Calculate the population of Male to Female in each conties and save the data into Male and Female.
- Save your data as a csv file with name NIPopulation.csv.

Question 3

- Given a non-empty array Write a python function to return only elements of the array that appear once.
  - E.g [22, 11, 11, 11, 11, 55, 55, 55, 55, 55, 66, 4, 4, 4, 4, 9, 11, 10] should return 22, 10