**PR 1: Store the basic information about students such as roll no, name, date of birth , and address of student using various collection types such as List, Set and Map**

To store and manage basic information about students (roll number, name, date of birth, and address) using various collection types in Python, you can use lists, sets, and dictionaries. Each collection type offers different benefits:

1. **Lists**: Ordered collection, allows duplicate members.
2. **Sets**: Unordered collection, no duplicate members.
3. **Dictionaries (Maps)**: Unordered collection of key-value pairs, where keys are unique.

Here's how you can use each collection type to store student information:

### Using List

Lists are suitable for storing multiple students' records as tuples or dictionaries.

**students\_list = [**

**{'roll\_no': 1, 'name': 'Alice', 'dob': '2001-01-01', 'address': '123 Apple St'},**

**{'roll\_no': 2, 'name': 'Bob', 'dob': '2002-02-02', 'address': '456 Banana St'},**

**{'roll\_no': 3, 'name': 'Charlie', 'dob': '2003-03-03', 'address': '789 Cherry St'}**

**]**

**# Accessing a student's information**

**print(students\_list[0])**

**# Output: {'roll\_no': 1, 'name': 'Alice', 'dob': '2001-01-01', 'address': '123 Apple St'}**

### Using Set

Sets can be used to store unique attributes or for ensuring there are no duplicate records. Here, we'll use sets to store unique student names.

**student\_names\_set = {'Alice', 'Bob', 'Charlie'}**

**# Adding a new student name**

**student\_names\_set.add('David')**

**# Checking for duplicate names**

**if 'Alice' in student\_names\_set:**

**print('Alice is already in the set')**

### Using Dictionary (Map)

Dictionaries are best for mapping unique roll numbers to student details, ensuring fast lookups and updates.

**students\_dict = {**

**1: {'name': 'Alice', 'dob': '2001-01-01', 'address': '123 Apple St'},**

**2: {'name': 'Bob', 'dob': '2002-02-02', 'address': '456 Banana St'},**

**3: {'name': 'Charlie', 'dob': '2003-03-03', 'address': '789 Cherry St'}**

**}**

**# Accessing a student's information using roll number**

**roll\_no = 1**

**print(students\_dict[roll\_no])**

**# Output: {'name': 'Alice', 'dob': '2001-01-01', 'address': '123 Apple St'}**

**# Adding a new student**

**students\_dict[4] = {'name': 'David', 'dob': '2004-04-04', 'address': '1010 Date St'}**

### Combining Collections

You can combine these collection types to manage student information more effectively. For example, using a dictionary to store student records and lists or sets for specific attributes:

**# Dictionary to store student records**

**students = {**

**1: {'name': 'Alice', 'dob': '2001-01-01', 'address': '123 Apple St'},**

**2: {'name': 'Bob', 'dob': '2002-02-02', 'address': '456 Banana St'},**

**3: {'name': 'Charlie', 'dob': '2003-03-03', 'address': '789 Cherry St'}**

**}**

**# List to store roll numbers**

**roll\_numbers = [1, 2, 3]**

**# Set to store unique names**

**unique\_names = {'Alice', 'Bob', 'Charlie'}**

**# Adding a new student**

**new\_student = {'name': 'David', 'dob': '2004-04-04', 'address': '1010 Date St'}**

**new\_roll\_no = 4**

**students[new\_roll\_no] = new\_student**

**roll\_numbers.append(new\_roll\_no)**

**unique\_names.add(new\_student['name'])**

**print(students)**

**print(roll\_numbers)**

**print(unique\_names)**

This approach leverages the strengths of each collection type to manage and access student information efficiently.