**Experiment No. 1**

**Create Complex Data Types and Perform SQL operations**

**Problem Statement**

Create Book Store database using complex data types such as structure, array and set. Solve the queries on that database.

**Description**

Create Book Store database using below schema and insert at least 5-7 tuples in each table.

| Table Name | Field | Data Type | Key | FK Reference |
| --- | --- | --- | --- | --- |
| Author | author\_id | varchar (10) | PK |  |
| name | Structured type (fname and lname) |  |  |
| Phone\_no | Varray(4) |  |  |
| Book | ISBN | integer | PK |  |
| title | varchar (30) |  |  |
| author\_id | vArray [10] |  |  |
| category | varchar (20) |  |  |
| publisher | Structured type (pub\_id, Pub\_name, branch) |  |  |
|  | keywords | multiset |  |  |
|  | price | Number (10,2) |  |  |
| Customer | customer\_id | varchar (10) | PK |  |
|  | name | Structured type (fname and lname) |  |  |
|  | phone | multiset |  |  |
| Book­\_Sale | sale\_id | varchar (10) | PK |  |
|  | customer\_id | varchar (10) | FK | Customer.customer\_id |
|  | ISBN | integer | FK | Book.ISBN |

Answer below SQL queries.

1. List all titles in “book” and include ISBN, author name (as combined from author.fname and author.lname).
2. List all customers who have purchased books published with ‘Tata MaGraw Hill’.
3. List customers (as combined from customer.fname and customer.lname) who have purchased books published in the UK or the US, as well as the title of the book they purchased and the name of its publisher and order by last name of customer.
4. List the different (distinct) categories and how many books belong to each category, order alphabetically by category.
5. List the number of books sold that have been written by each author and group by author’s first name.

Q 2. Consider a database schema with a relation Emp whose attributes are as shown below, with types specified for multivalued attributes.

Emp= (ename, ChildrenSet multiset(Children), SkillSet multiset(Skills))

Children = (name, birthday)

Skills = (type, ExamSet setof(Exams))

Exams = (year, city)

a. Define the above schema in SQL, with appropriate types for each attribute.

b. Using the above schema, write the following queries in SQL.

* + 1. Find the names of all employees who have a child born on or after January 1, 2000.
    2. Find those employees who took an examination for the skill type “typing” in the city “Dayton”.
    3. List all skill types in the relation Emp.