**PAPER – II                 PRACTICAL NO. : 01**

**AIM : CREATE DIFFERENT TYPES THAT INCLUDE ATTRIBUTES AND METHODS. DEFINE TABLES FOR THESE TYPES BY ADDING A SUFICIENT NUMBER OF TUPLES. DEMONSTRATE INSERT, UPDATE AND DELETE OPERATIONS ON THESE TABLES. EXECUTE QUERIES ON THEM.**

**ROLL NO. : 02                                BATCH : M.SC PART-I**

**DATE : / /22**

**Using Object Oriented databases create the following types:**

**AddrType (Pincode: number, Street :char, City : char, state :char)**

**(ii)BranchType (address: AddrType, phone1: integer,phone2: integer )**

**AuthorType (name:char,addr AddrType)**

**PublisherType (name: char, addr: AddrType, branches: BranchTableType**

**AuthorListType as varray, which is a reference to AuthorType**

**Next create the following tables:**

**a) BranchTableType of BranchType**

**b) authors of AuthorType**

**c) books(title: varchar, year : date, published\_by ref PublisherType,authors AuthorListType)**

**d) Publishers of PublisherType**

**Insert 10 records into the above tables and fire the following queries:**

**a) List all of the authors that have the same address as their   publisher**

**b) List all of the authors that have the same pin code as their publisher**

**c) List all books that have 2 or more authors**

**d) List the title of the book that has the most authors**

**e) List the name of the publisher that has the most branches**

**f) Name of authors who have not published a book**

**g) Move all the branches that belong to the publisher 'tata' to the publisher ‘‘joshi'**

**h) List all authors who have published more than one book**

**i) Name of authors who have published books with at least two different publishers?**

**j) List all books (title) where the same author appears more than once on the list of authors (assuming that an integrity constraint requiring that the name of an author is unique in a list of authors has not been specified).**

**CODE :**

SQL> connect

Enter user-name: system

Enter password:

Connected.

**Step 1 : Create different Types**

**AddressType :**

SQL> Create Type AddrType as object(

2 Pincode number(5),

3 Street char(20),

4 City varchar2(20),

5 State varchar2(20));

6 /

Type created.

**BranchType :**

SQL> Create Type BranchType as object(

2 Address AddrType,

3 Phone1 integer,

4 Phone2 integer);

5 /

Type created.

SQL> Create type BranchTableType as table of BranchType;

2 /

Type created.

**AuthorType :**

SQL> Create Type AuthorType as object(

2 Name varchar(50),

3 Address AddrType);

4 /

Type created.

**PublisherType :**

SQL> Create Type PublisherType as object(

2 Name varchar(50),

3 Address AddrType,

4 Branch BranchTableType);

5 /

Type created.

**AuthorListType :**

SQL> Create type AuthorListType as varray(10) of ref

2 AuthorType;

3 /

Type created.

**Step 2 : Create different Tables**

**BranchTable :**

SQL> Create Table BranchTableType1 of BranchType;

Table created.

**AuthorTable :**

SQL> Create Table authors of AuthorType;

Table created.

**BookTable :**

SQL> Create Table Books (

2 title varchar2(50),

3 year date,

4 published\_by ref PublisherType,

5 authors AuthorListType);

Table created.

**PublisherTable :**

SQL> create table Publishers of PublisherType nested table Branch

2 store as Branchtable;

Table created.

**Step 3: Insertion of different values in Tables**

**Insertion of values in AuthorTable :**

SQL> insert into authors values('stallings',

2 AddrType(5002,'sstreet','pune','mha'));

1 row created.

SQL> insert into authors values('Bijith',

2 AddrType(7007,'sstreet','mumbai','mha'));

1 row created.

SQL> insert into authors values('Navathe',

2 AddrType(7008,'nstreet','nasik','mha'));

1 row created.

SQL> insert into authors values('Ulman',

2 AddrType(7003,'dstreet','goa','goa'));

1 row created.

SQL> insert into authors values('Dhumdhare',

2 AddrType(7007,'sstreet','mumbai','mha'));

1 row created.

SQL> insert into authors values('Aho',

2 AddrType(7006,'nstreet','mumbai','mha'));

1 row created.

SQL> insert into authors values('rabiner',

2 AddrType(8002,'dstreet','pune','mha'));

1 row created.

SQL> insert into authors values('Dhanovan',

2 AddrType(8003,'dstreet','pune','mha'));

1 row created.

SQL> insert into authors values('R.Ramakrishnan',

2 AddrType(8003,'fstreet','Banglore','krt'));

1 row created.

SQL> insert into authors values('Akshata',

2 AddrType(8003,'fstreet','Banglore','krt'));

1 row created.

SQL> insert into authors values('Salivahanan',

2 AddrType(8003,'fstreet','Banglore','krt'));

1 row created.

**Insertion of values in PublisherTable :**

SQL> insert into Publishers values('tata',

2 AddrType(4002,'rstreet','mumbai','mha'),

3 BranchTableType(BranchType(

4 AddrType(5002,'fstreet','mumbai','mha'),23406,69896)));

1 row created.

SQL> insert into Publishers values('tata',

2 AddrType(4002,'rstreet','mumbai','mha'),

3 BranchTableType(BranchType(

4 AddrType(5010,'sstreet','mumbai','mha'),25506,69810)));

1 row created.

SQL> insert into Publishers values('seth',

2 AddrType(7007,'sstreet','mumbai','mha'),

3 BranchTableType(BranchType(

4 AddrType(7007,'sstreet','mumbai','mha'),4543545,8676775)));

1 row created.

SQL> insert into Publishers values('joshi',

2 AddrType(7008,'sstreet','mumbai','mha'),

3 BranchTableType(BranchType(

4 AddrType(1002,'sstreet','nasik','mha'),456767,7675757)));

1 row created.

SQL> insert into Publishers values('seth',

2 AddrType(7002,'sstreet','pune','mha'),

3 BranchTableType(BranchType(

4 AddrType(1002,'sstreet','pune','mha'),4543545,8676775)));

1 row created.

SQL> insert into Publishers values('chetana',

2 AddrType(6002,'sstreet','nasik','mha'),

3 BranchTableType(BranchType(

4 AddrType(6002,'sstreet','nasik','mha'),4543545,8676775)));

1 row created.

**Insertion of values in BookTable :**

SQL> select 'java','28-may-1983',ref(pub),AuthorListType(ref(aut)) from

2 Publishers pub,authors aut where pub.Name='joshi' and aut.Name='Aho';

1 row created.

SQL> insert into Books

2 select 'java','28-may-1983',ref(pub),AuthorListType(ref(aut)) from

3 Publishers pub,authors aut where pub.Name='joshi' and aut.Name='Ulman';

1 row created.

SQL> insert into Books

2 select 'java','28-may-1983',ref(pub),AuthorListType(ref(aut)) from

3 Publishers pub,authors aut where pub.Name='chetana' and aut.Name='stallings';

1 row created.

SQL> insert into Books

2 select 'compiler','09-jan-1890',ref(pub),AuthorListType(ref(aut)) from

3 Publishers pub,authors aut where pub.Name='chetana' and aut.Name='Dhanovan';

1 row created.

SQL> insert into Books

2 select 'c','25-may-1983',ref(pub),AuthorListType(ref(aut)) from

3 Publishers pub,authors aut where pub.Name='tata' and aut.Name='stallings';

2 rows created.

SQL> insert into Books

2 select 'c','25-may-1983',ref(pub),AuthorListType(ref(aut)) from

3 Publishers pub,authors aut where pub.Name='tata' and aut.Name='rabiner';

2 rows created.

SQL> insert into Books

2 select 'c','25-may-1983',ref(pub),AuthorListType(ref(aut)) from

3 Publishers pub,authors aut where pub.Name='tata' and aut.Name='Salivahanan';

2 rows created.

SQL> insert into Books

2 select 'c','25-may-1983',ref(pub),AuthorListType(ref(aut)) from

3 Publishers pub,authors aut where pub.Name='chetana' and aut.Name='Dhonovan';

0 rows created.

**Step 4: Firing queries on created table**

**a) List all of the authors that have the same address as their publisher :**

SQL> select a.Name from authors a, Publishers p where a.Address = p.Address;

NAME

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Bijith

Dhumdhare

**b) List all of the authors that have the same pin code as their publisher :**

SQL> select a.Name from authors a, Publishers p where a.Address.Pincode = p.Address.Pincode;

NAME

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Bijith

Navathe

Dhumdhare

**c)  List all books that have 2 or more authors:**

SQL> select \* from Books b where (select count(\*)from table(b.authors)) >1;

TITLE

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Java

c

**d) List the title of the book that has the most authors :**

SQL> Select title from Books b, table(b.authors) group by title having count(\*)

2 =

3 (select max(count(\*))from Books b, table(b.authors) group by title);

TITLE

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c

**e) List the name of the publisher that has the most branches :**

SQL> Select p.Name

2 from Publishers p, table(p.Branch)

3 group by p.Name having count(\*)> = all (select count(\*)

4 from Publishers p, table(p.Branch)

5 group by Name);

NAME

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seth

tata

**f)Name of authors who have not published a book :**

SQL> Select a.Name

2 from authors a

3 where not exists( select b.title

4 from Books b, table(b.authors)

5 where a.Name =b.authors.Name);

NAME

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Dhumdhare

R.Ramakrishnan

Navathe

**g) Move all the branches that belong to the publisher 'tata' to the publisher ‘‘joshi” :**

SQL> insert into table(select Branch from Publishers where Name = 'joshi') select b.\* from Publishers p, table(p.Branch) b

2 where Name = 'tata';

2 rows created.

SQL> select \* from Publishers;

NAME

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ADDRESS(PINCODE, STREET, CITY, STATE)

--------------------------------------------------------------------------------

BRANCH(ADDRESS(PINCODE, STREET, CITY, STATE), PHONE1, PHONE2)

--------------------------------------------------------------------------------

tata

ADDRTYPE(4002, 'rstreet ', 'mumbai', 'mha')

BRANCHTABLETYPE(BRANCHTYPE(ADDRTYPE(5002, 'fstreet ', 'mumbai', 'mha

'), 23406, 69896))

tata

ADDRTYPE(4002, 'rstreet ', 'mumbai', 'mha')

NAME

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ADDRESS(PINCODE, STREET, CITY, STATE)

--------------------------------------------------------------------------------

BRANCH(ADDRESS(PINCODE, STREET, CITY, STATE), PHONE1, PHONE2)

--------------------------------------------------------------------------------

BRANCHTABLETYPE(BRANCHTYPE(ADDRTYPE(5010, 'sstreet ', 'mumbai', 'mha

'), 25506, 69810))

seth

ADDRTYPE(7007, 'sstreet ', 'mumbai', 'mha')

BRANCHTABLETYPE(BRANCHTYPE(ADDRTYPE(7007, 'sstreet ', 'mumbai', 'mha

'), 4543545, 8676775))

NAME

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ADDRESS(PINCODE, STREET, CITY, STATE)

--------------------------------------------------------------------------------

BRANCH(ADDRESS(PINCODE, STREET, CITY, STATE), PHONE1, PHONE2)

--------------------------------------------------------------------------------

joshi

ADDRTYPE(7008, 'sstreet ', 'mumbai', 'mha')

BRANCHTABLETYPE(BRANCHTYPE(ADDRTYPE(1002, 'sstreet ', 'nasik', 'mha'

), 456767, 7675757), BRANCHTYPE(ADDRTYPE(5002, 'fstreet ', 'mumbai',

'mha'), 23406, 69896), BRANCHTYPE(ADDRTYPE(5010, 'sstreet ', 'mumba

i', 'mha'), 25506, 69810))

NAME

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ADDRESS(PINCODE, STREET, CITY, STATE)

--------------------------------------------------------------------------------

BRANCH(ADDRESS(PINCODE, STREET, CITY, STATE), PHONE1, PHONE2)

--------------------------------------------------------------------------------

seth

ADDRTYPE(7002, 'sstreet ', 'pune', 'mha')

BRANCHTABLETYPE(BRANCHTYPE(ADDRTYPE(1002, 'sstreet ', 'pune', 'mha')

, 4543545, 8676775))

chetana

NAME

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ADDRESS(PINCODE, STREET, CITY, STATE)

--------------------------------------------------------------------------------

BRANCH(ADDRESS(PINCODE, STREET, CITY, STATE), PHONE1, PHONE2)

--------------------------------------------------------------------------------

ADDRTYPE(6002, 'sstreet ', 'nasik', 'mha')

BRANCHTABLETYPE(BRANCHTYPE(ADDRTYPE(6002, 'sstreet ', 'nasik', 'mha'

), 4543545, 8676775))

6 rows selected.

**h) List all authors who have published more than one book :**

SQL> select a.Name

2 from authors a, Books b, table(b.authors) v where v.column\_value = ref(a) group by a.Name having count(\*) > 1;

NAME

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stallings

Salivahanan

rabiner

**i)Name of authors who have published books with at least two different publishers?**

SQL> select a.Name from authors a,Books b,table(b.authors) v where v.column\_value=ref(a) group by a.Name;

NAME

--------------------------------------------------

stallings

Salivahanan

Ulman

Dhanovan

rabiner

**j) List all books (title) where the same author appears more than once on the list of authors (assuming that an integrity constraint requiring that the name of an author is unique in a list of authors has not been specified).**

SQL> select title from authors a, Books b, table(b.authors) v

2 where v.column\_value = ref(a) group by title having count(\*) > 1

3 ;

TITLE

--------------------------------------------------

java

c