

```
create table abc(  
    pid integer Primary key  
)
```

```
create type Nameobject AS OBJECT (  
    fname VARCHAR(20),  
    lname VARCHAR(20)  
);
```

```
create type phonearraylist AS VARRAY(4) OF VARCHAR(15);
```

```
// Create Structured Type for Publisher  
CREATE TYPE Publisher_Type AS OBJECT (  
    pub_id VARCHAR2(10),  
    pub_name VARCHAR2(30),  
    branch VARCHAR2(30)  
);
```

```
// Create VARRAY Type for Author IDs  
CREATE TYPE Author_Varray AS VARRAY(10) OF VARCHAR2(10);  
  
-- Create Nested Table Type for Keywords  
CREATE TYPE Keywords_Table AS TABLE OF VARCHAR2(100);  
  
-- Create Nested Table Type for Phone Numbers in Customer Table  
CREATE TYPE Phone_Table AS TABLE OF VARCHAR2(15);  
  
-- Create Table Author  
CREATE TABLE Author (  
    author_id VARCHAR2(10) PRIMARY KEY,  
    name Nameobject,  
    phone_no phonearraylist  
);
```

```
-- Create Table Book

CREATE TABLE Book (

ISBN NUMBER PRIMARY KEY,

title VARCHAR2(30),

author_id Author_Varray,

category VARCHAR2(20),

publisher Publisher_Type,

keywords Keywords_Table,

price NUMBER(10, 2)

) NESTED TABLE keywords STORE AS keywords_store_table;
```

```
-- Create Table Customer

CREATE TABLE Customer (

customer_id VARCHAR2(10) PRIMARY KEY,

name Nameobject,

phone Phone_Table

) NESTED TABLE phone STORE AS phone_store_table;
```

```
-- Create Table Book_Sale

CREATE TABLE Book_Sale (

sale_id VARCHAR2(10) PRIMARY KEY,

customer_id VARCHAR2(10),

ISBN NUMBER,

FOREIGN KEY (customer_id) REFERENCES Customer(customer_id),

FOREIGN KEY (ISBN) REFERENCES Book(ISBN)

);
```

```
--Now, inserting Sampe data into
```

```
-- Insert data into Author
```

```
INSERT INTO Author VALUES (

'A001',
```

```
Nameobject('Prachi', 'Patil'),  
phonearraylist('1234567890', '0987654321')  
);
```

```
INSERT INTO Author VALUES (  
    'A003',  
    Nameobject('Komal', 'Jadhav'),  
    phonearraylist('1234567890', '9876543210')  
);
```

```
INSERT INTO Author VALUES (  
    'A005',  
    Nameobject('Shruti', 'Ghate'),  
    phonearraylist('0123456789', '9876543210')  
);
```

```
INSERT INTO Author VALUES (  
    'A002',  
    Nameobject('Johm', 'Doe'),  
    phonearraylist('1234509876', '0987612345')  
);
```

```
INSERT INTO Author VALUES (  
    'A006',  
    Nameobject('Prachi', 'Patil'),  
    phonearraylist('1234509876', '0987612345')  
);
```

-- Insert data into Book

```
INSERT INTO Book VALUES (  
    1001,  
    'Database Systems',  
    Author_Varray('A001', 'A002'),  
    'Education',
```

```
Publisher_Type('P001', 'Tata MaGraw Hill', 'India'),
Keywords_Table('SQL', 'NoSQL'),
499.99
);
INSERT INTO Book VALUES (
1004,
'The Great Gatsby',
Author_Varray('A004'),
'Literature',
Publisher_Type('P004', 'Penguin Random House', 'US'),
Keywords_Table('Novel', 'American Literature', 'Jazz Age'),
299.99
);
INSERT INTO Book VALUES (
1005,
'Wise and Otherwise',
Author_Varray('A005'),
'Literature',
Publisher_Type('P005', 'HarperCollins', 'UK'),
Keywords_Table('Novel', 'Romance', 'Historical Fiction'),
349.99
);
INSERT INTO Book VALUES (
1002,
'Advanced Databases',
Author_Varray('A001'),
'Technology',
Publisher_Type('P002', 'O''Reilly Media', 'US'),
Keywords_Table('Database', 'Advanced'),
599.99
);
```

-- Insert data into Customer

```
INSERT INTO Customer VALUES (  
    'C002',  
    Nameobject('Bob', 'Builder'),  
    Phone_Table('1234765432')  
);
```

```
INSERT INTO Customer VALUES (  
    'C001',  
    Nameobject('Alice', 'Wonderland'),  
    Phone_Table('1234987654')  
);
```

```
INSERT INTO Customer VALUES (  
    'C003',  
    Nameobject('Sherlock', 'Holmes'),  
    Phone_Table('1234567890')  
);
```

```
INSERT INTO Customer VALUES (  
    'C004',  
    Nameobject('Dr. Watson', 'Watson'),  
    Phone_Table('0123456789')  
);
```

-- Insert data into Book_Sale

```
INSERT INTO Book_Sale VALUES (  
    'S001',  
    'C001',  
    1001  
);
```

```
INSERT INTO Book_Sale VALUES (  
    'S002',  
    'C002',  
    1002  
);
```

```
INSERT INTO Book_Sale VALUES (  
    'S004',  
    'C003',  
    1004  
);
```

```
INSERT INTO Book_Sale VALUES (  
    'S005',  
    'C004',  
    1005  
);
```

Q.1 List all titles in “book” and include ISBN, author name (as combined from author.fname and author.lname).

The screenshot shows the Oracle SQL Developer interface. On the left, the 'Connections' pane shows 'B27_ads' selected. The 'Reports' pane is also visible. The main window displays a SQL query for Q1 in the 'Query Builder' tab. The query is as follows:

```
//Q1
SELECT
  b.ISBN,
  b.title,
  a.name.fname || ' ' || a.name.lname AS author_name
FROM
  Book b
JOIN
  TABLE(b.author_id) a_id ON 1=1
JOIN
  Author a ON a.author_id = a_id.COLUMN_VALUE;
```

The 'Script Output' and 'Query Result' tabs are active. The 'Query Result' tab shows the following data:

	ISBN	TITLE	AUTHOR_NAME
1	1001	Database Systems	Prachi Patil
2	1001	Database Systems	johm Doe
3	1005	Wise and Otherwise	Shruti Ghat
4	1002	Advanced Databases	Prachi Patil

Q.2 List all customers who have purchased books published with ‘Tata MaGraw Hill’

The screenshot shows the Oracle SQL Developer interface. The 'Query Result' tab is active, displaying the following data:

	CUSTOMER_NAME
1	Alice Wonderland

Q.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.

Welcome Page x B27_ads x

Worksheet Query Builder

```
//Q3
SELECT
    c.name.fname || ' ' || c.name.lname AS customer_name,
    b.title AS book_title,
    b.publisher.pub_name AS publisher_name
FROM
    Book_Sale bs
JOIN
    Book b ON bs.ISBN = b.ISBN
JOIN
    Customer c ON bs.customer_id = c.customer_id
WHERE
    b.publisher.branch IN ('UK', 'US')
ORDER BY
    c.name.lname;

//Q.4
SELECT
    b.category,
    COUNT(*) AS book_count
FROM
    Book b
GROUP BY
    b.category
ORDER BY
    b.category;

//.5
```

Script Output x Query Result x

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	CUSTOMER_NAME	BOOK_TITLE	PUBLISHER_NAME
1	Bob Builder	Advanced Databases	O'Reilly Media
2	Sherlock Holmes	The Great Gatsby	Penguin Random House
3	Dr. Watson Watson	Wise and Otherwise	HarperCollins

Q.4 List the different (distinct) categories and how many books belong to each category, order alphabetically by category.

Worksheet Query Builder

```
//Q.4
SELECT
    b.category,
    COUNT(*) AS book_count
FROM
    Book b
GROUP BY
    b.category
ORDER BY
    b.category;
```

```
//.5
SELECT
    a.name.fname AS author_first_name,
    COUNT(bs.sale_id) AS number_of_books_sold
FROM
    Book_Sale bs
JOIN
    Book b ON bs.ISBN = b.ISBN
JOIN
    TABLE(b.author_id) a_id ON a_id.COLUMN_VALUE = b.author_id
JOIN
    Author a ON a.author_id = a_id.COLUMN_VALUE
GROUP BY
    a.name.fname
ORDER BY
    a.name.fname;
```












































Script Output x Query Result x

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CATEGORY	BOOK_COUNT
1 Education	1
2 Literature	2
3 Technology	1

Q.5 List the number of books sold that have been written by each author and group by author's first name.

Welcome Page xB27_ads x














































WorksheetQuery Builder

```
c.name.lname;

//Q.4
SELECT
    b.category,
    COUNT(*) AS book_count
FROM
    Book b
GROUP BY
    b.category
ORDER BY
    b.category;

//.5
SELECT
    a.name.fname AS author_first_name,
    COUNT(bs.sale_id) AS books_sold_count
FROM
    Book b
JOIN
    TABLE(b.author_id) a_id ON 1=1
JOIN
    Author a ON a.author_id = a_id.COLUMN_VALUE
LEFT JOIN
    Book_Sale bs ON b.ISBN = bs.ISBN
GROUP BY
    a.name.fname
ORDER BY
    a.name.fname;
```

Script Output xQuery Result x



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	AUTHOR_FIRST_NAME	BOOKS_SOLD_COUNT
1	Prachi	2
2	Shruti	1
3	johm	1