Database – PL/SQL

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# 1 – Create the Tables

## 1.1 - Books

CREATE TABLE books (

isbn VARCHAR2(13) NOT NULL PRIMARY KEY,

title VARCHAR2(200),

summary VARCHAR2(2000),

author VARCHAR2(200),

date\_published DATE,

page\_count NUMBER

);

/

## 1.2 – Book Copies

CREATE TABLE book\_copies(

barcode\_id VARCHAR2(100) NOT NULL PRIMARY KEY,

isbn VARCHAR2(13) REFERENCES books (isbn)

ON DELETE CASCADE

);

# 2 – Procedures to Add Books & Copies

## 2.1 - Procedure to addBooks

CREATE OR REPLACE PROCEDURE addBooks(

v\_isbn books.isbn%TYPE,

v\_title books.title%TYPE,

v\_summary books.summary%TYPE,

v\_author books.author%TYPE,

v\_date\_published books.date\_published%TYPE,

v\_page\_count books.page\_count%TYPE

)

AS BEGIN

INSERT INTO books (isbn, title, summary, author, date\_published, page\_count)

VALUES (v\_isbn, v\_title, v\_summary, v\_author, v\_date\_published, v\_page\_count);

END addBooks;

## 2.2 – Insert Into addBooks

BEGIN

addBooks (1,'Oracle PL/SQL Programming.','Considered the best Oracle PL/SQL programming guide by the Oracle','Steven Feuerstein',TO\_DATE('16-02-14', 'dd/mm/yy'), 1392);

addBooks (2,'GDPR For Dummies.','Dont be afraid of the GDPR wolf','Learning Made Easy', TO\_DATE('23-01-20', 'dd/mm/yy'), 464);

addBooks (3,'Designing Data-Intensive Applications.','Data is at the center of many challenges in system design today','Martin Kleppmann',TO\_DATE('25-01-16', 'dd/mm/yy'), 400);

addBooks (4,'Oracle PL/SQL for Dummies.','Find tips for creating efficient PL/SQL code If you know a bit about SQL, this book will make PL/SQL programming painless','Michael Rosenblum',TO\_DATE('26-05-06', 'dd/mm/yy'), 464);

END;

## 2.3 – Procedure to addBookCopies

CREATE OR REPLACE PROCEDURE addBookCopies(

v\_barcode book\_copies.barcode\_id%TYPE,

v\_isbn book\_copies.isbn%TYPE

)

AS BEGIN

INSERT INTO book\_copies (barcode\_id, isbn)

VALUES (v\_barcode, v\_isbn);

END addBookCopies;

## 2.4 – Insert Into addBooksCopies

BEGIN

--addBookCopies (barcode\_id, isbn);

addBookCopies (129167337463, 1);

addBookCopies (849421534208, 2);

addBookCopies (868023917703, 3);

addBookCopies (828324957607, 1);

addBookCopies (162033145736, 2);

addBookCopies (966025947302, 3);

addBookCopies (162033145775, 4);

addBookCopies (162123145775, 4);

addBookCopies (966025947321, 4);

END;

# 3 – Count Books & Copies

## 3.1 – Count Books

CREATE OR REPLACE FUNCTION bookCount

RETURN number IS

total number(2) := 0;

BEGIN

SELECT DISTINCT count(\*) into total

FROM books;

-- WHERE isbn = &x;

-- This part doesn’t work.

RETURN total;

END;

## 3.2 – Test bookCount

-- Test the count

DECLARE

-- c = count

c number(2);

BEGIN

c := bookCount();

dbms\_output.put\_line('Total no. of distinct Books: ' || c);

END;

## 3.3 – Count Book Copies

CREATE OR REPLACE FUNCTION bookCopiesC

RETURN number IS

total number(2) := 0;

BEGIN

SELECT count(\*) into total

FROM books

INNER JOIN book\_copies

ON books.isbn = book\_copies.isbn

ORDER BY books.isbn asc;

RETURN total;

END;

## 3.4 – Test bookCopiesC

DECLARE

-- c = count

c number(2);

BEGIN

c := bookCopiesC();

dbms\_output.put\_line('Total no. of book-copies available: ' || c);

END;

# 4 – Procedure to Get Book Details from input.

## 4.1 – Procedure to Get Book Details

CREATE OR REPLACE PROCEDURE getBookDetails(

v\_isbn IN books.isbn%TYPE,

v\_title OUT books.title%TYPE,

v\_author OUT books.author%TYPE,

v\_date\_published OUT books.date\_published%TYPE,

-- NumberOfCopies should be my count function, but can't figure it out.

v\_numberOfCopies OUT INT)

IS BEGIN

SELECT title, author, date\_published

INTO v\_title, v\_author, v\_date\_published

FROM books WHERE isbn = v\_isbn;

SELECT COUNT(\*) INTO v\_numberOfCopies

FROM book\_copies

WHERE isbn = v\_isbn;

END;

## 4.2 – Test Get Book Details procedure

DECLARE

v\_isbn books.isbn%TYPE;

v\_title books.title%TYPE;

v\_author books.author%TYPE;

v\_date\_published books.date\_published%TYPE;

v\_numberOfCopies NUMBER;

BEGIN

v\_isbn := &x; -- := &x will ask for user input

-- Call the getBookDetails procedure

getBookDetails1 (v\_isbn, v\_title, v\_author, v\_date\_published, v\_numberOfCopies);

-- Print to Dbms Output

dbms\_output.put\_line( 'Book ' || v\_isbn || '. Titled ' || v\_title || ' Written by ' || v\_author || '. Published: ' || v\_date\_published || '. With ' || v\_numberofcopies || ' Copies Available.');

END;

# 5 – Loop through Get Book Details for each entry

## 5.1 – Loop through Get Book Details

DECLARE

v\_isbn books.isbn%TYPE;

v\_title books.title%TYPE;

v\_author books.author%TYPE;

v\_date\_published books.date\_published%TYPE;

v\_numberOfCopies INT;

v\_i NUMBER := 0;

v\_myIndex NUMBER := 0;

BEGIN

-- Get the number of books, Save into v\_myIndex

SELECT COUNT(\*) INTO v\_myIndex FROM books;

-- Loop when v\_i is less than the number of books

WHILE v\_i < v\_myIndex

LOOP

-- Increment

v\_i := v\_i + 1;

-- ID = dynamic variable

v\_isbn := v\_i;

-- Use the getBookDetails to get the info we want

getBookDetails (v\_isbn, v\_title, v\_author, v\_date\_published, v\_numberOfCopies);

-- Print to Dbms Output

dbms\_output.put\_line('Book ' || v\_isbn || '. Titled ' || v\_title || ' Written by ' || v\_author || '. Published: ' || v\_date\_published || '. With ' || v\_numberofcopies || ' Copies Available.');

END LOOP;

END;

# 6 – Procedure that deletes a book and all copies

## 6.1 – Delete Procedure

CREATE OR REPLACE PROCEDURE bookDelete(

v\_isbn IN books.isbn%TYPE

)

IS BEGIN

DELETE FROM books

WHERE isbn = v\_isbn;

COMMIT;

END;

## 6.2 – Delete a book to test it

BEGIN

-- Select between 1 - 4 for which book&copies to delete.

bookDelete(&x);

END;

# 7 – Trigger whenever a record is inserted/updated/deleted

## 7.1 – Create the Book Trigger

CREATE OR REPLACE TRIGGER bookTrigger

AFTER DELETE OR INSERT OR UPDATE ON book\_copies

DECLARE

total number;

BEGIN

SELECT COUNT(\*) INTO TOTAL -- Should be my Count function

FROM book\_copies;

dbms\_output.put\_line('There are now ' || total || ' copies available.');

-- print

END;

## 7.2 – Test with a Delete

-- Delete && trigger should run

BEGIN

delete from book\_copies where barcode\_id = 966025947321;

END;

## 7.3 – Test with an insert

BEGIN

INSERT INTO book\_copies (barcode\_id, isbn)

VALUES (123432123454, 4);

END;

## 7.4 – Test with an update

BEGIN

UPDATE book\_copies

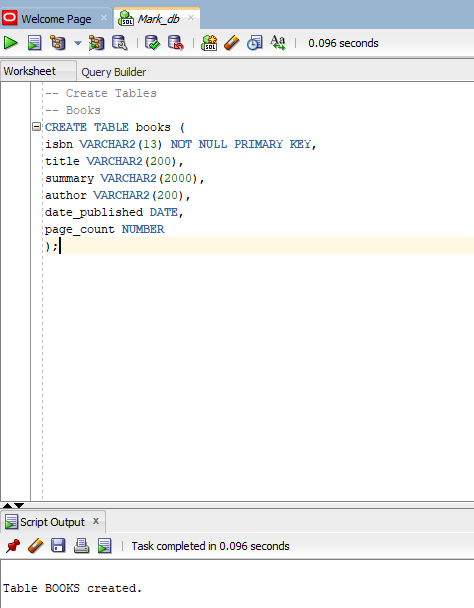
SET isbn = 3'

WHERE barcode\_id = 123432123454;

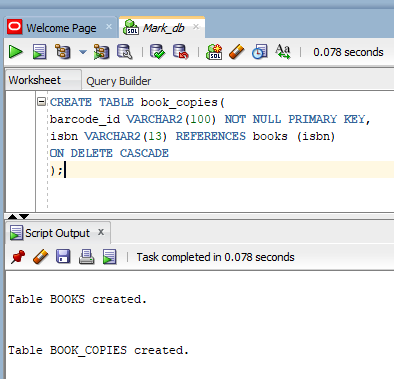
END;

# 8 – Appendix

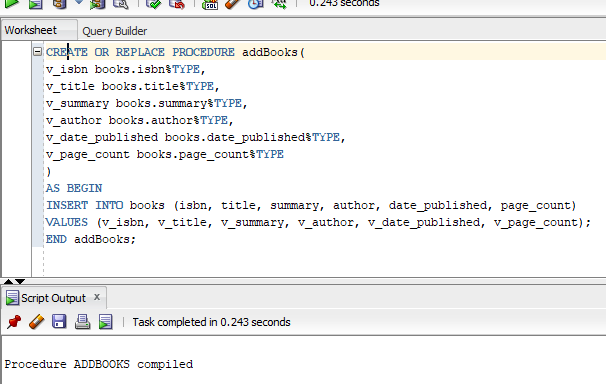
## 8.1 – Create Books Table



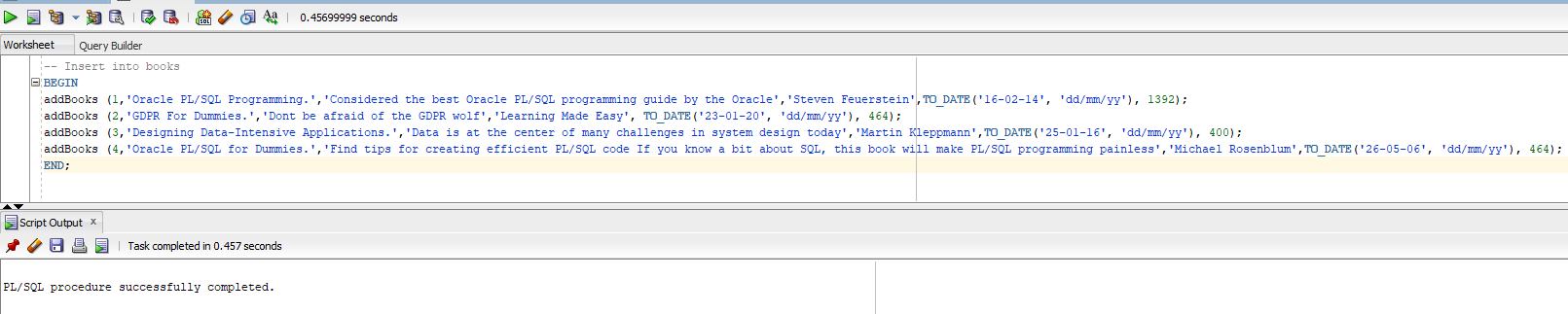
## 8.2 – Create Book Copies



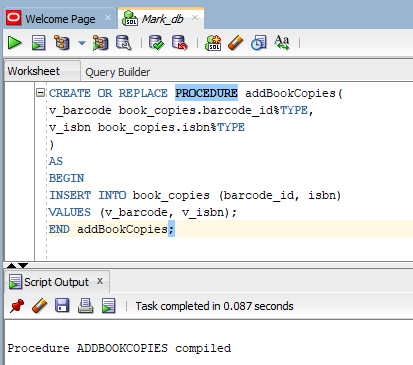
## 8.3 – Add Books Procedure



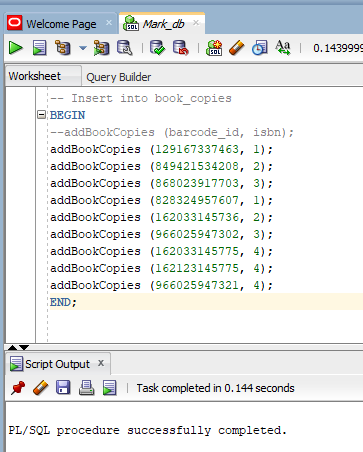
## 8.4 – Insert Books



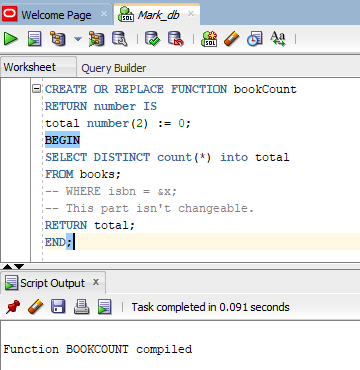
## 8.5 – Add Book Copies Procedure



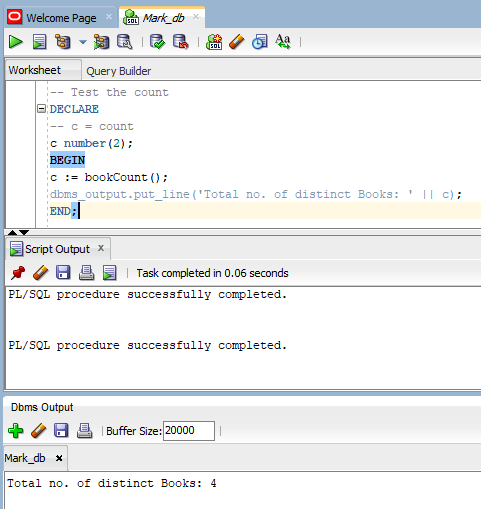
## 8.6 – Insert Book Copies



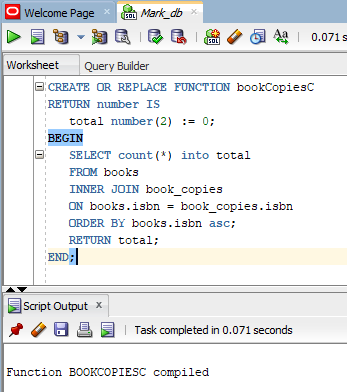
## 8.7 – Book Count



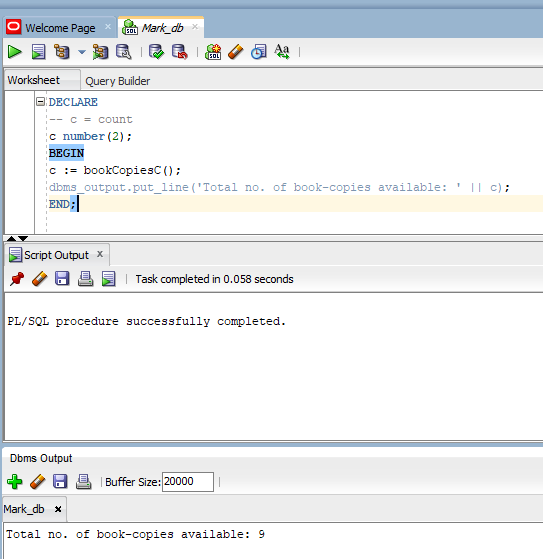
## 8.8 – Test Book Count



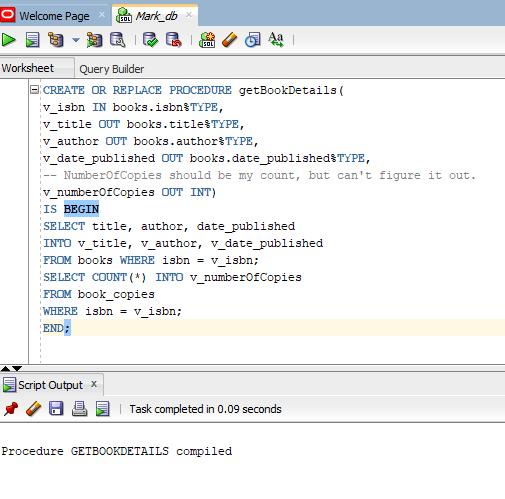
## 8.9 – Book Copies Count



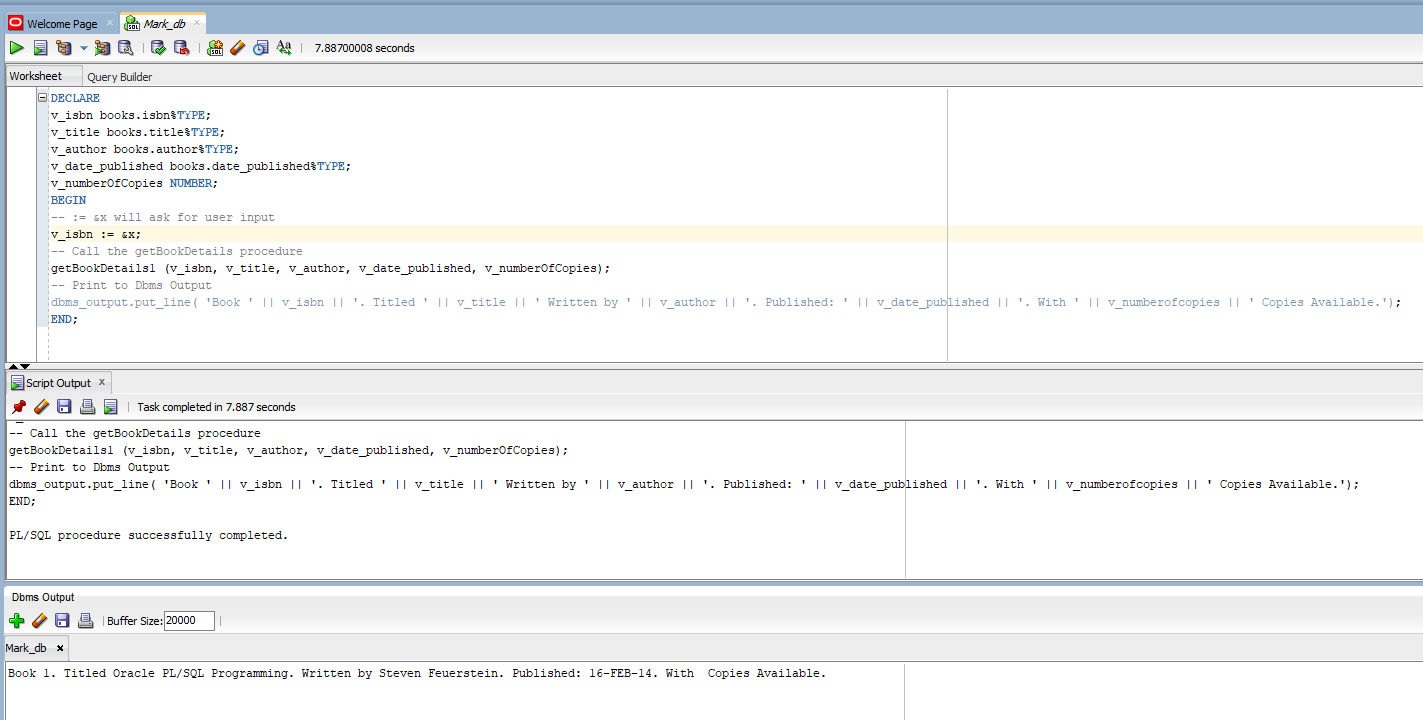
## 8.10 – Test Book Copies Count



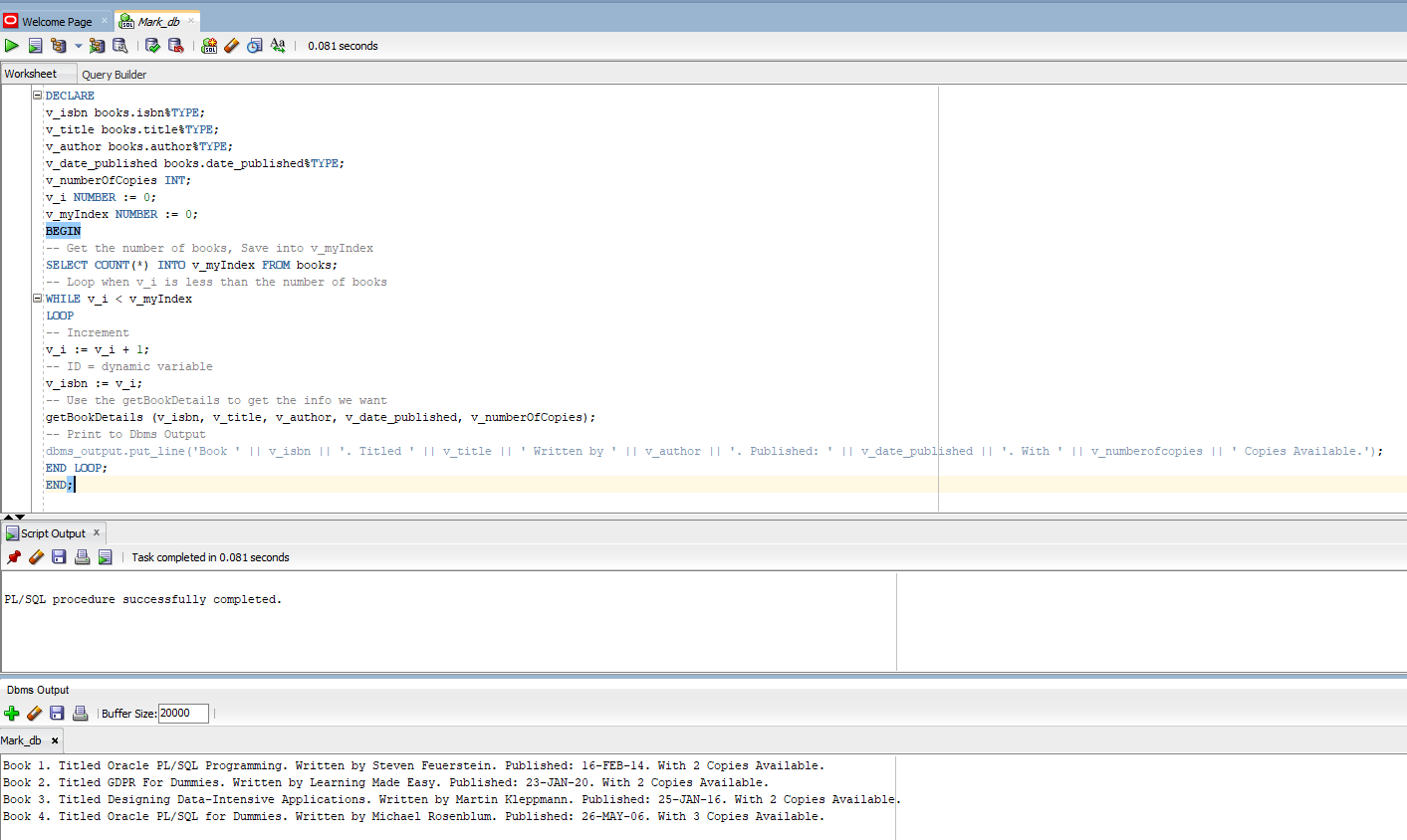
## 8.11 – Get Book Details Procedure



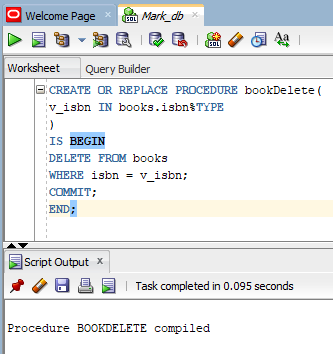
## 8.12 – Test Get Book Details with input 1



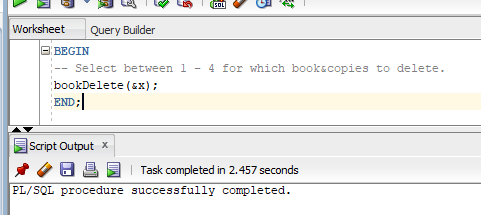
## 8.13 – Loop through Get Book Details



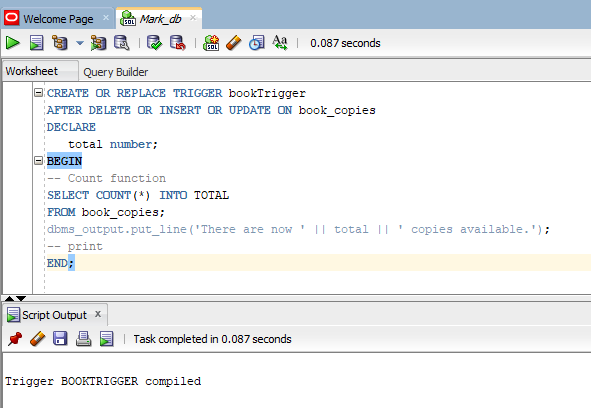
## 8.14 – Book Delete Procedure



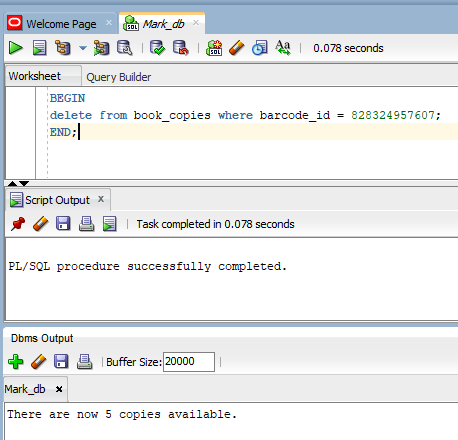
## 8.15 – Test Book Delete with 4



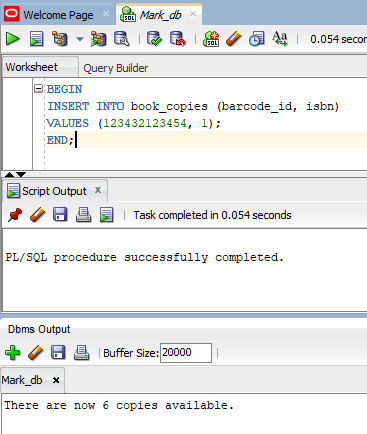
## 8.16 – Trigger For Delete/Insert/Update



## 8.17 – Test Trigger with Delete



## 8.18 – Test Trigger with Insert



## 8.19 – Test Trigger with Update

