

Database Lab Report 0x0A

Course: Database Management

Lab Number: Lab #0x0A

Date: 2025-4-29

Name: Ryan Munger

1. Objective

To write some cool stored procedures in PostgreSQL.

2. Lab Setup

A freshly loaded courses database

3. Procedure

Part 1:

Write two functions (stored procedures) that take an integer course number as their only parameter:

1. Function PreReqsFor(courseNum)

Returns the immediate prerequisites for the passed-in course number

```
-- returning as table to be cool
CREATE OR REPLACE FUNCTION get_prereqs_for(check_course int)
RETURNS TABLE(course int, prereq int) AS
$$
BEGIN
    RETURN QUERY
        SELECT coursenum, prereqnum
        FROM prerequisites
        WHERE coursenum = check_course;
END;
$$
LANGUAGE plpgsql;

-- Test
SELECT *
FROM get_prereqs_for(499);
```

2. Function IsPreReqFor(courseNum)

Returns the courses for which the passed-in course number is an immediate pre-requisite.

```
-- trying refcursor now
CREATE OR REPLACE FUNCTION is_prereq_for(int, REFCURSOR) RETURNS REFCURSOR AS
```

```

$$
DECLARE
    check_course int      := $1;
    resultset     REFCURSOR := $2;
BEGIN
    OPEN resultset FOR
        SELECT prereqnum, coursenum
        FROM prerequisites
        WHERE prereqnum = check_course;
    RETURN resultset;
END;
$$
LANGUAGE plpgsql;

-- Test
BEGIN; -- psql wouldn't take it as a single statement without this
SELECT is_prereq_for(120, 'results');
FETCH all FROM results;
COMMIT;

```

3. Optional Recursive Challenge

Demonstrate Jedi-level skills and write a third, recursive, function that takes a passed-in course number and generates all of its prerequisites. Uses the first two functions you wrote and recursion.

```

CREATE OR REPLACE FUNCTION jedi_get_all_prereqs(check_course int)
RETURNS TABLE(course int, prereq int) AS
$$
BEGIN
    RETURN QUERY
    WITH RECURSIVE all_prereqs(course, prereq) AS (
        -- Base case
        SELECT * FROM get_prereqs_for(check_course)

        UNION

        -- Recursive case
        SELECT p.coursenum, p.prereqnum
        FROM prerequisites p
        INNER JOIN all_prereqs ap ON p.coursenum = ap.prereq
    )
    SELECT * FROM all_prereqs;
END;
$$
LANGUAGE plpgsql;

-- Test
SELECT *
FROM jedi_get_all_prereqs(499);

```