Lab 1

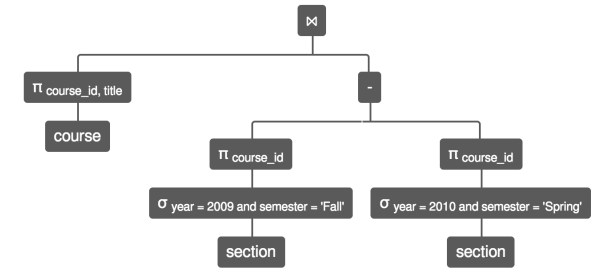
Michael Peterson

1)

```
SELECT COURSE_ID, TITLE
FROM COURSE
WHERE COURSE_ID IN (SELECT COURSE_ID FROM SECTION WHERE YEAR = 2009 AND SEMESTER = 'Fall')
        AND
    COURSE_ID NOT IN (SELECT COURSE_ID FROM SECTION WHERE YEAR = 2010 AND SEMESTER = 'Spring');
```

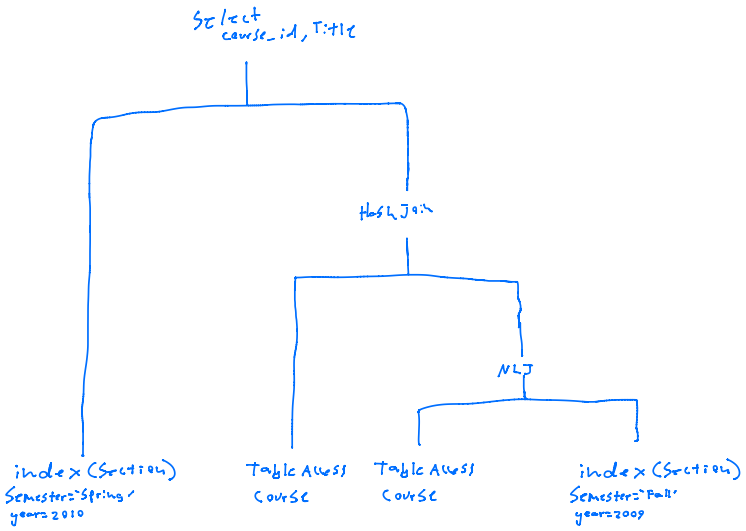
	COURSE_ID	TITLE
1	CS-347	Database System Concepts
2	PHY-101	Physical Principles

My initial Plan:

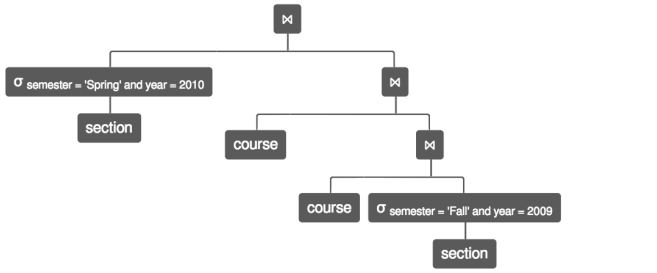


(π course_id, title course) ⋈ (π course_id (σ year = 2009 and semester = 'Fall' (section)) - π course_id (σ year = 2010 and semester = 'Spring' (section)))

Oracle plan



Updated plan



(σ semester = 'Spring' and year = 2010 (section)) ⋈ (course ⋈ (course ⋈ σ semester = 'Fall' and year = 2009 (section)))

2)

```
DROP TABLE semester_lookup;
CREATE GLOBAL TEMPORARY TABLE semester_lookup (
    semester varchar(20),
    semester_value integer
);

INSERT INTO semester_lookup(semester, semester_value) values('Winter', 0);
INSERT INTO semester_lookup(semester, semester_value) values('Spring', 1);
INSERT INTO semester_lookup(semester, semester_value) values('Summer', 2);
INSERT INTO semester_lookup(semester, semester_value) values('Fall'  , 3);

SELECT ID, NAME
FROM STUDENT WHERE ID NOT IN (
    SELECT DISTINCT ID
    FROM TAKES
        NATURAL JOIN STUDENT
        NATURAL JOIN semester_lookup
    WHERE (YEAR * 10 + semester_value) < 20101
    );
```

	ID	NAME
1	19991	Brandt
2	23121	Chavez
3	55739	Sanchez
4	70557	Snow

3)

```
SELECT COUNT(DISTINCT ID) as count
FROM (SELECT DISTINCT SEC_ID FROM TEACHES WHERE ID = 10101) NATURAL JOIN TAKES;
```

	COUNT
1	12

4)

```
SELECT NAME
FROM instructor
WHERE salary > ALL (
    SELECT MIN(SALARY)
    FROM INSTRUCTOR
    WHERE DEPT_NAME = 'Biology'
);
```

	NAME
1	Wu
2	Einstein
3	Gold
4	Katz
5	Singh
6	Brandt
7	Kim

5)

```
SELECT c1.title AS course_title, c2.title AS prereq_title
FROM  course c1 JOIN prereq p ON p.COURSE_ID = c1.COURSE_ID
JOIN course c2 ON p.PREREQ_ID = c2.COURSE_ID;
```

	COURSE_TITLE	PREREQ_TITLE
1	Genetics	Intro. to Biology
2	Computational Biology	Intro. to Biology
3	Game Design	Intro. to Computer Science
4	Robotics	Intro. to Computer Science
5	Image Processing	Intro. to Computer Science
6	Database System Concepts	Intro. to Computer Science
7	Intro. to Digital Systems	Physical Principles

6)

```
SELECT i1.ID AS instructor1_id, i1.SALARY AS instructor1_salary,
       i2.ID AS instructor2_id, i2.SALARY AS instructor2_salary,
       i1.DEPT_NAME as department
FROM instructor i1 JOIN instructor i2 ON i1.DEPT_NAME = i2.DEPT_NAME
WHERE i1.ID != i2.ID AND i1.SALARY > i2.SALARY;
```

	INSTRUCTOR1_ID	INSTRUCTOR1_SALARY	INSTRUCTOR2_ID	INSTRUCTOR2_SALARY	DEPARTMENT
1	83821	92000	10101	65000	Comp. Sci.
2	45565	75000	10101	65000	Comp. Sci.
3	58583	62000	32343	60000	History
4	22222	95000	33456	87000	Physics
5	83821	92000	45565	75000	Comp. Sci.
6	12121	90000	76543	80000	Finance