L07: Advanced Topics in SQL and Database Design

ANLY 640/PPOL 740: Relational Databases and SQL Programming

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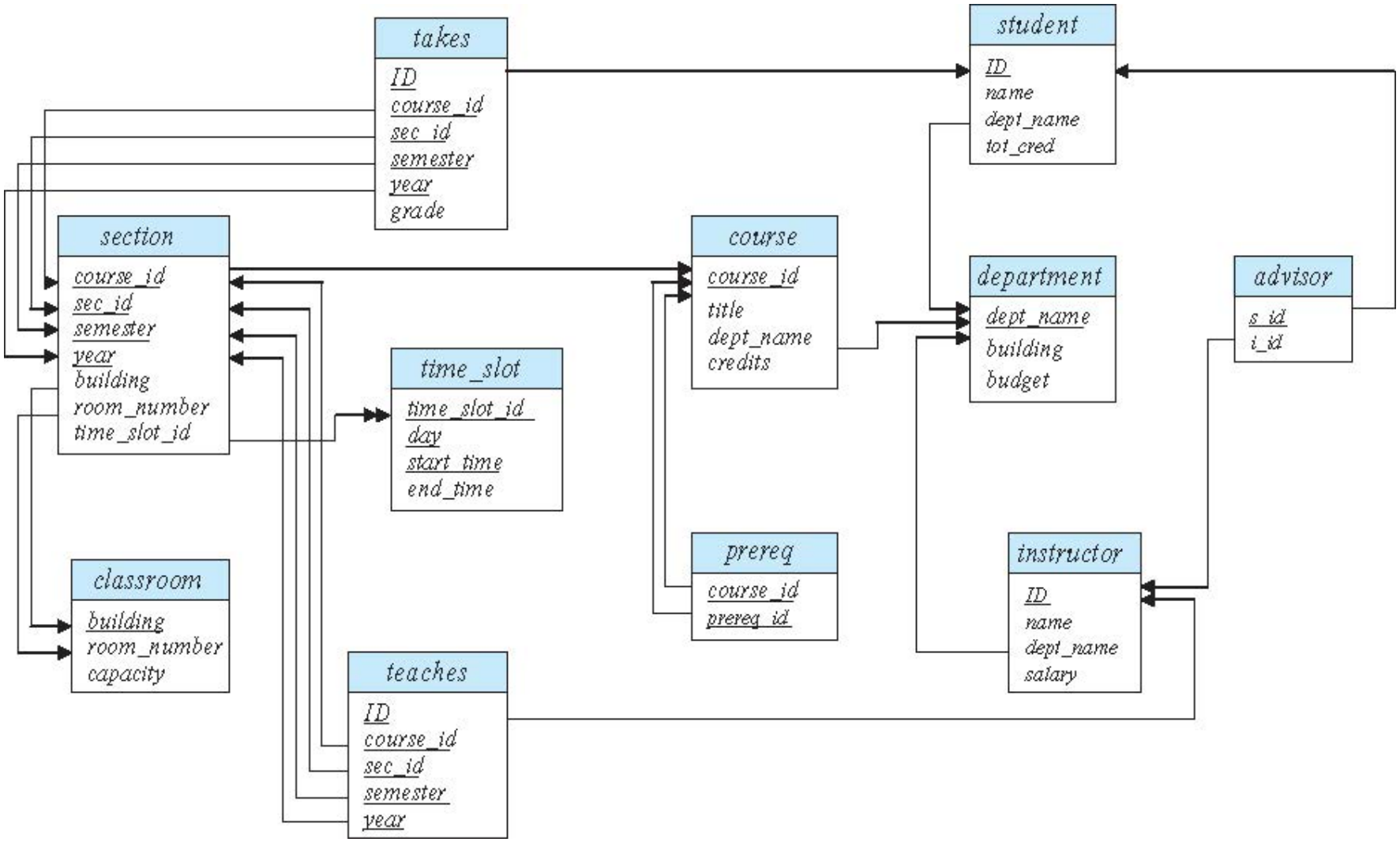
GEORGETOWN UNIVERSITY

Lab 07

Schema Diagram for University Database



Problem 1 (Demo, was shown in class)

Write a query to find out which courses are a prerequisite *whether directly or indirectly*, for any course.

Answer to Problem 1

Write a query to find out which courses are a prerequisite *whether directly or indirectly*, for any course.

```
with recursive rec_prereq(course_id, prereq_id) as (
        select course_id, prereq_id
        from prereq
    union
        select rec_prereq.course_id, prereq.prereq_id
        from rec_prereq, prereq
        where rec_prereq.prereq_id = prereq.course_id
    )
select *
from rec_prereq;
```

Problem 2a

Create a view tot_credits;

tot_credits (year, num_credits)

with the total number of credits taken by all students in each year.

Answer to Problem 2a

Create a view tot_credits

tot_credits (year, num_credits)

with the total number of credits taken by all students in each year.

```
create view tot_credits as
select year, sum(credits) as num_credits
from takes natural join course
group by year;

select *
from tot_credits
order by year;
```

Problem 2b

Get the average total credits over for the window 3 years before and 2 years after the current year

Problem 2b

Get the average total credits over for the window 3 years before and 2 years after the current year

```
select year, avg(num_credits)
over (order by year rows between 3 preceding and 2
   following)
as avg_total_credits
from tot_credits;
```

Problem 2c (to be submitted)

Get the average total credits over all prior years

1. use over(order…
2. use the view you created in 2a.

Problem 2d (to be submitted)

Rank order all students by total credit

Problem 3a (to be submitted)

Create a view tot_credits_dept

tot_credits_dept (year, dept_name, num_credits)

with the total number of credits taken by all students in each year for courses offered by each department

Problem 3b (to be submitted)

Compute average number of credits over three preceding years per department using the view you created in 3a

Problem 4 (to be submitted)

Compute maximum number of credits over for the window of 2 years before and 2 years after the current year per department