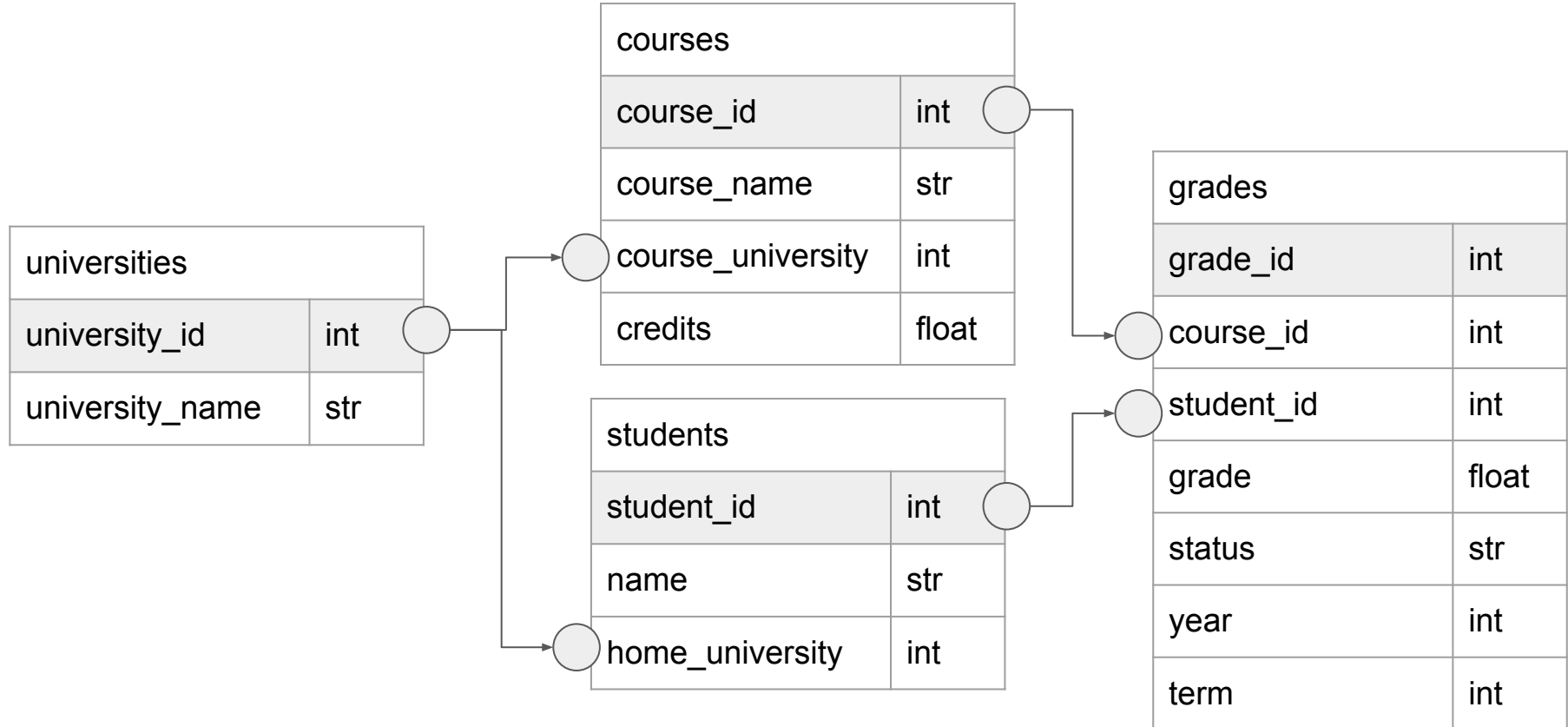


Task 3

MOX interview assignment
Pedro Hernandez

Outline a prototype to administer the student exchange program and Provide a data model diagram in 3NF to support this system

The schema below shows the model diagram for the system to administer the program



Write an optimised query that will list all of the classes a single student is taking across all universities for a particular term and their GPA for the term (include notes how you would optimise the query)

The queries can be found below.

To optimize the query I would look how to cache the intermediate result (list of courses with grades and credits and then) write two queries on it, one for the aggregate one for the list.

CALCULATE GPA:

```
SELECT SUM(credits * grade) / SUM(credits)) as GPA from
(SELECT c.university_name, c.course_name, c.credits, g.grade
FROM grades as g
INNER JOIN courses as c
ON g.course_id = c.course_id
WHERE g.student_id = 123
AND g.year = 2019
AND g.term = 2
AND g.status = 'COMPLETED')
```

LIST COURSES:

```
SELECT c.university_name, c.course_name
FROM grades as g
INNER JOIN courses as c
ON g.course_id = c.course_id
WHERE g.student_id = 123
AND g.year = 2019
AND g.term = 2
AND g.status = 'COMPLETED'
```

• What extra considerations to the above might there be in making a single system for multiple Universities?

I believe the model explained here would cover for this case. Of course this is assuming universities have similar study plans and grading systems. All universities would have to adjust to the model which very few times happens in reality