Lecture slides - Week 10

OOP - Inheritance

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Inheritance

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Inheritance in OOP refers to the ability of a class to inherit attributes and behavior from another class.

In Python, you can use inheritance by creating a new class that derives from an existing class.

The new class (child/subclass) then automatically gains access to the attributes and methods of the existing class (parent/base class).

This allows for code reusability and creating a hierarchy of classes with specialized features.

Inheritance in OOP is `is-a` relationship

The `is-a` relationship and the `has-a` relationship are two different types of relationships used in OOP to model connections between classes.

The `is-a` relationship is based on inheritance. It signifies that a class is a specialized version of another class.

For example, (1) if you have classes like `Animal` and `Dog`, you'd say that a `Dog` `is-a` type of `Animal`.

(2) If you have classes like `Car` and `Toyota`, you'd say that a `Toyota` `is-a` type of `Car`.

Case Study: University Organizational Structure

University Organizational Structure: People, Roles, and Course Associations

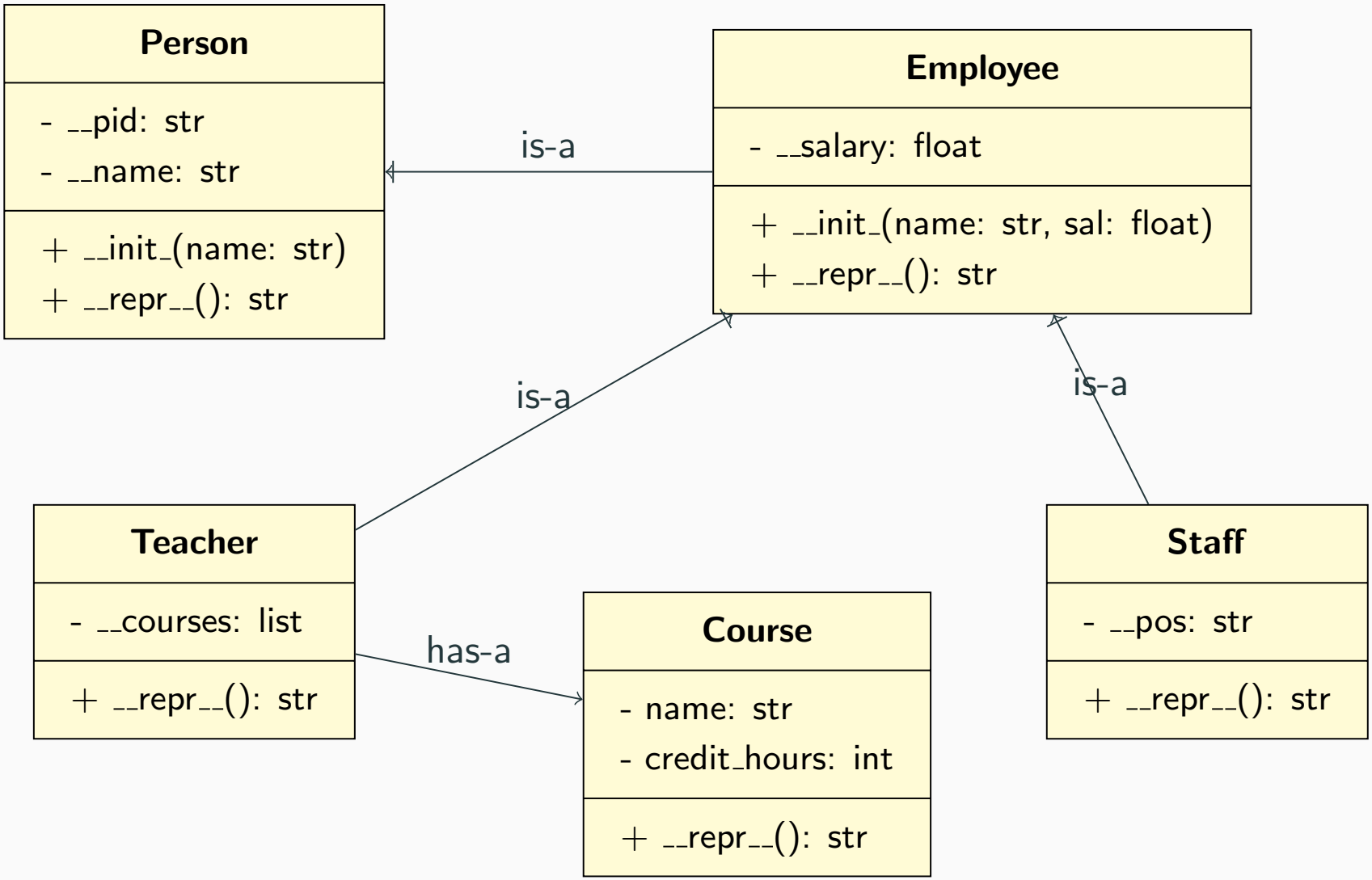
Within the university system, a diverse array of individuals exists, all falling under the broader category of "people." Among these individuals, some serve as employees, while others assume the role of students. These employees further subdivide into two distinct categories: teachers and staff members.

Both teachers and students have specific roles linked to courses. Teachers are responsible for instructing and leading courses, while students are engaged in taking these courses.

The employees, encompassing both teachers and staff, receive compensation in the form of salaries for their services within the university structure. The students who are engaged primarily in learning and academic pursuits.

Activity: Draw UML Class Diagrams

Class Diagrams i



Class Diagrams ii