

17-723: Designing Large-scale Software Systems

Modeling Exercises

Administrative Info

- Team Formation Survey has been sent out in Slack.
Please fill out until Sunday
- The next two lectures will have required reading (see Slack or course website)
Please read before the lecture

What Types of Models Can Illustrate Design?

- **Context Diagram**
Relationships between domain entities
- **Data Model**
Store data and relationships
- **Component Diagram**
Runtime components and their connections
- **Sequence Diagram**
Order of events and messages sent between components

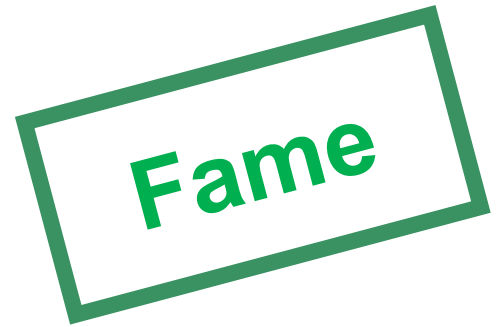
Hall of Fame or Hall of Shame?

Shame

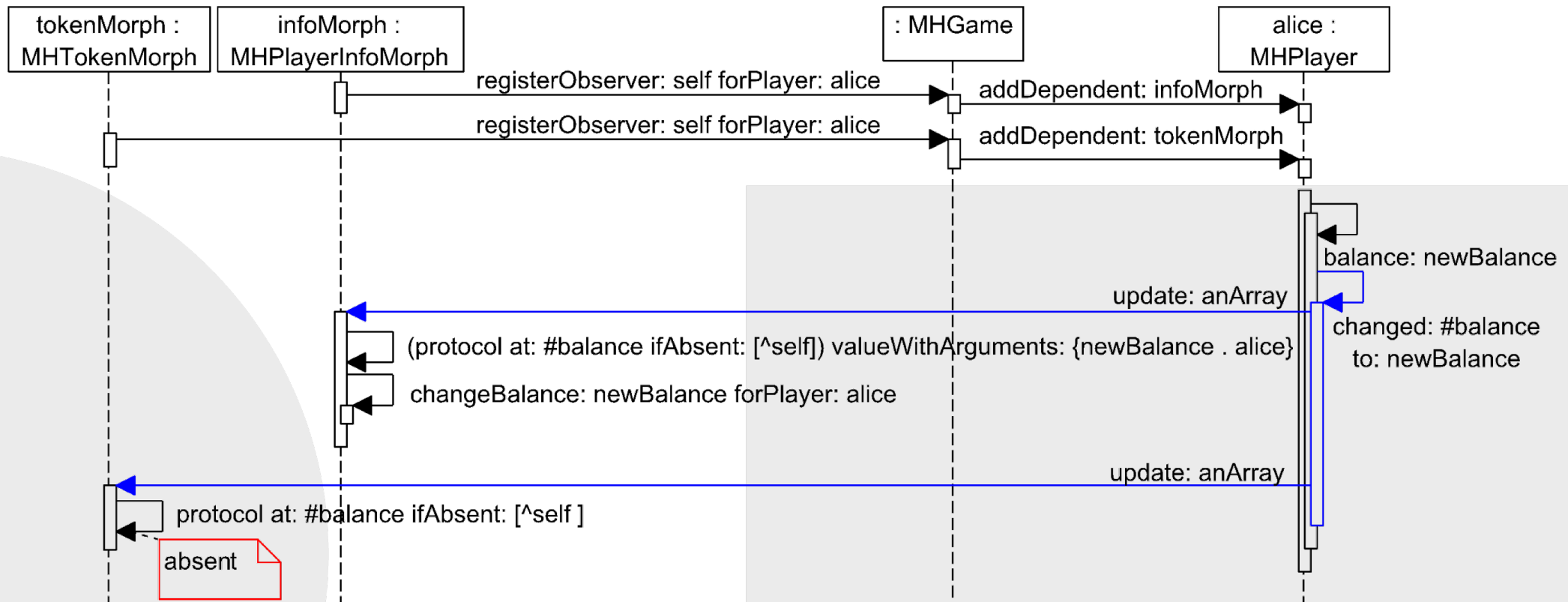


Too huge

**Confusing
Connections**

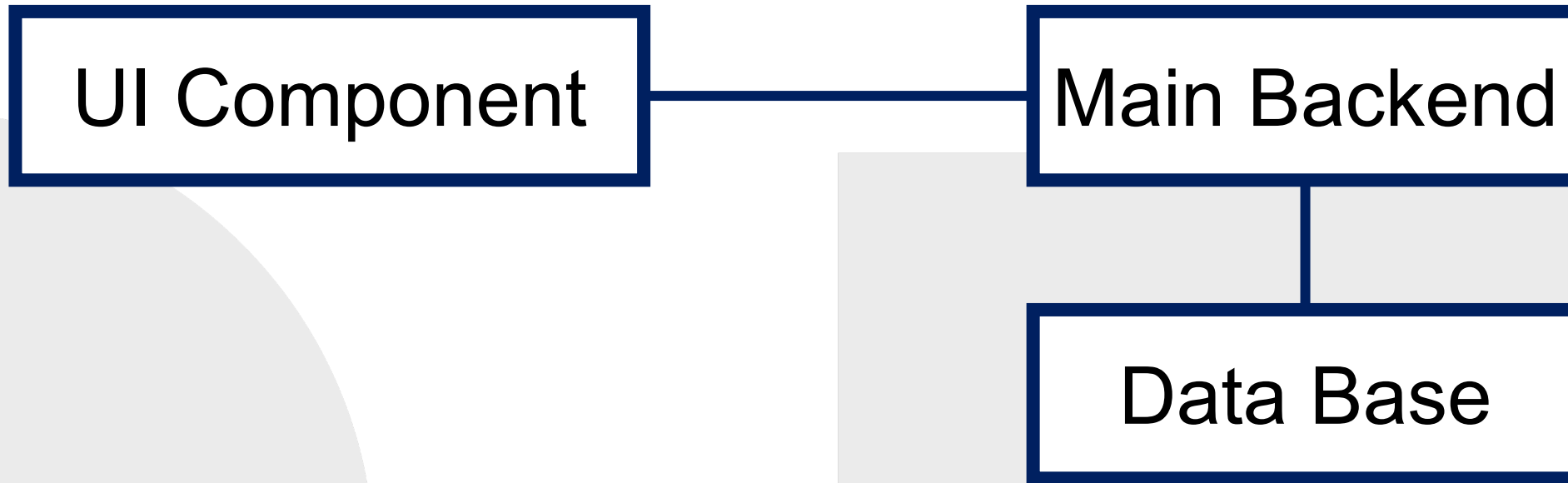


Hall of Fame or Hall of Shame?



Hall of Fame or Hall of Shame?

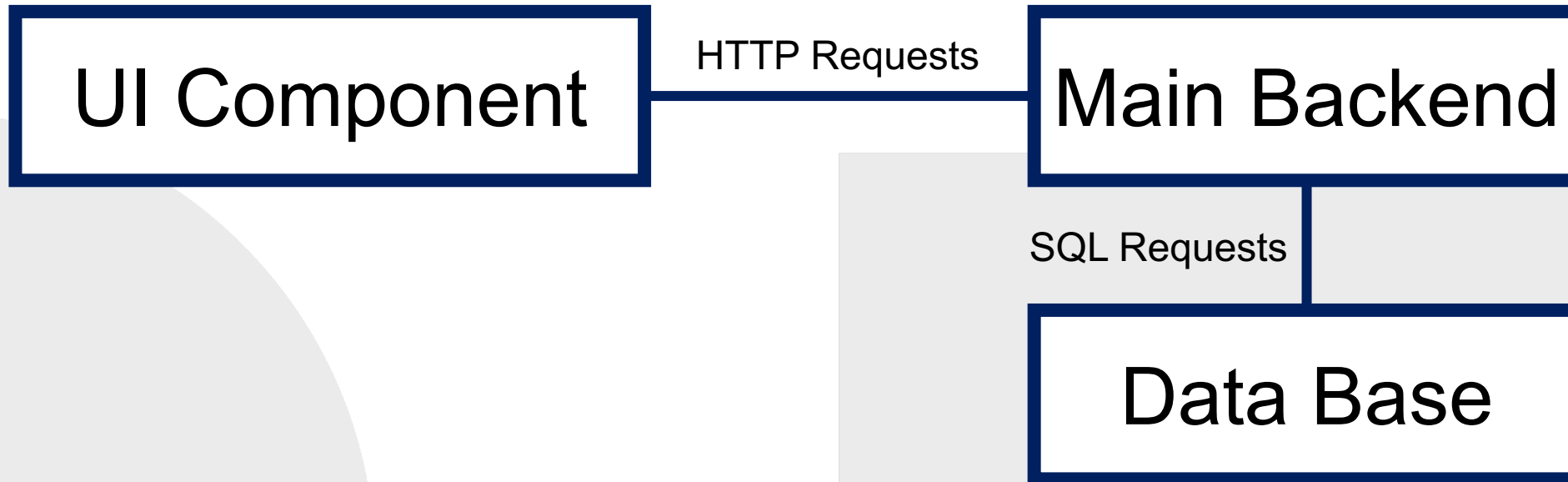
Shame



Connections are not named. It is unclear how components communicate

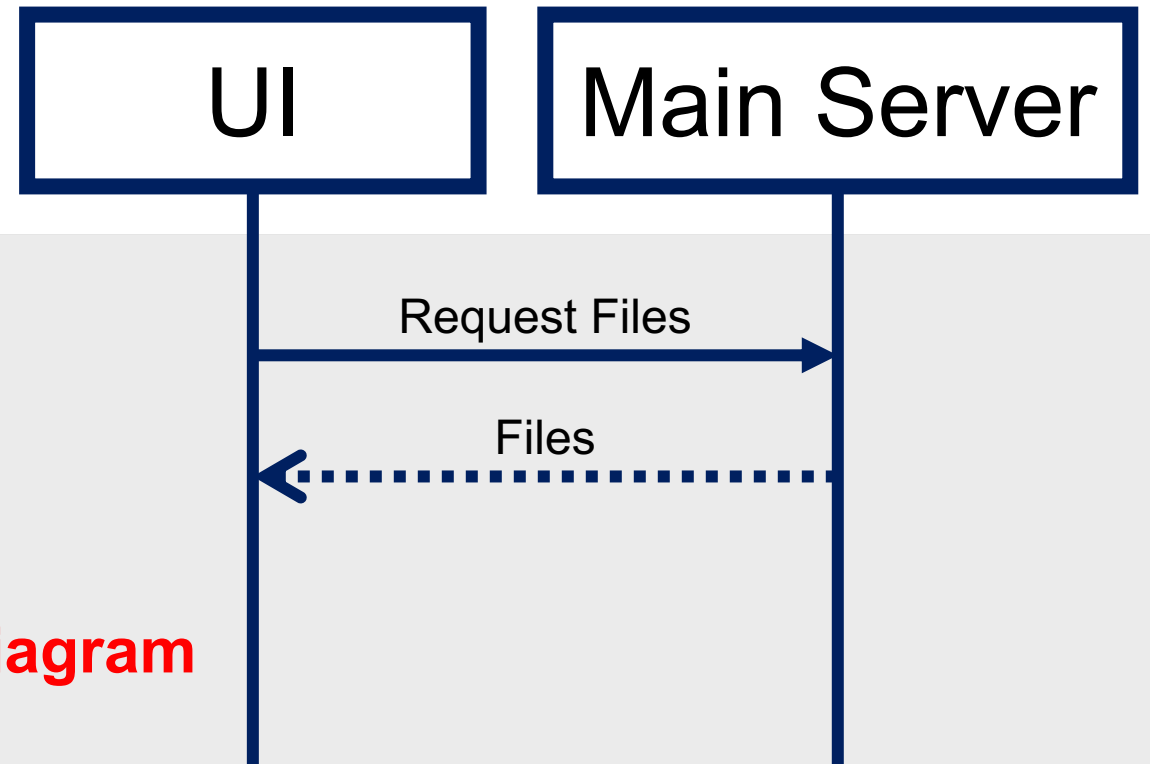
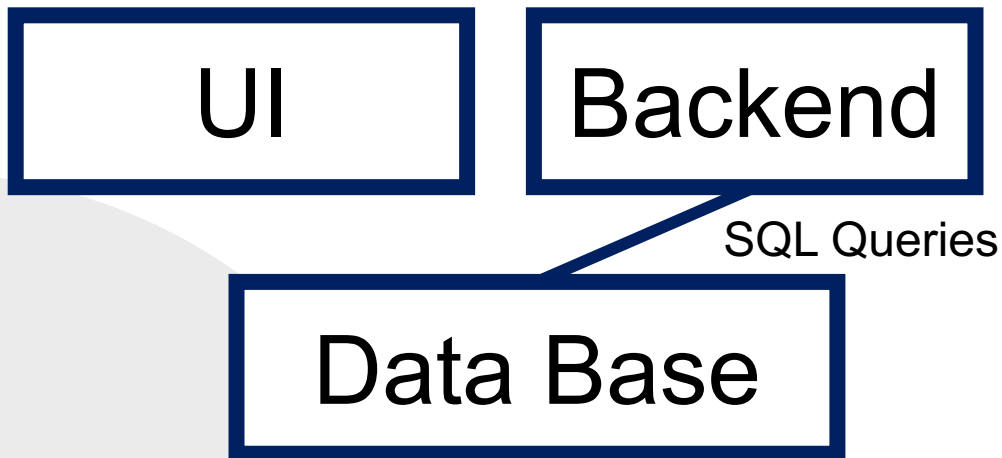
Fame

Hall of Fame or Hall of Shame?



Shame

Hall of Fame or Hall of Shame?

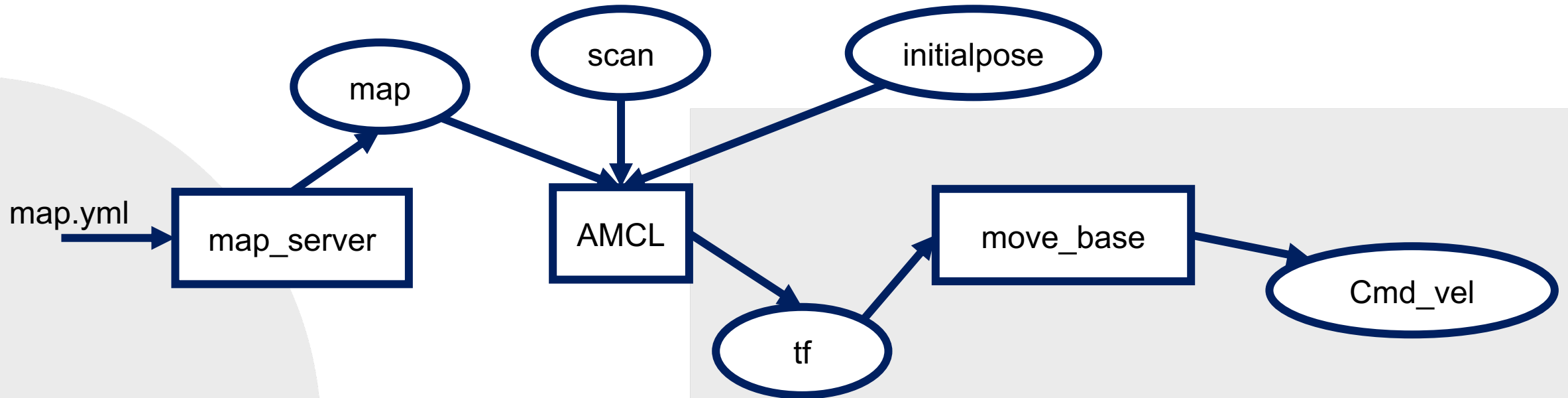


Views are inconsistent

- **Connection missing in Component Diagram**
- **Inconsistent Component Names**

Hall of Fame or Hall of Shame?

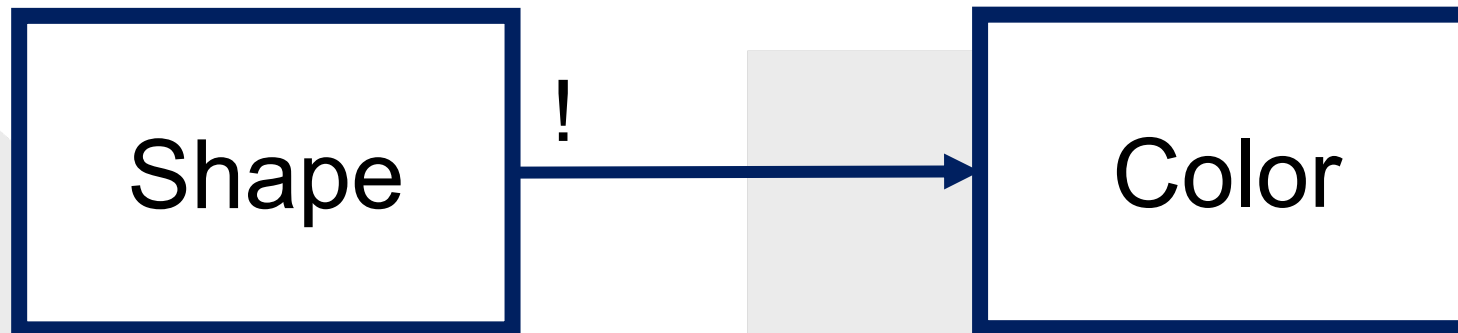
Shame



Missing Legend for Custom Notation

Hall of Fame or Hall of Shame?

Shame

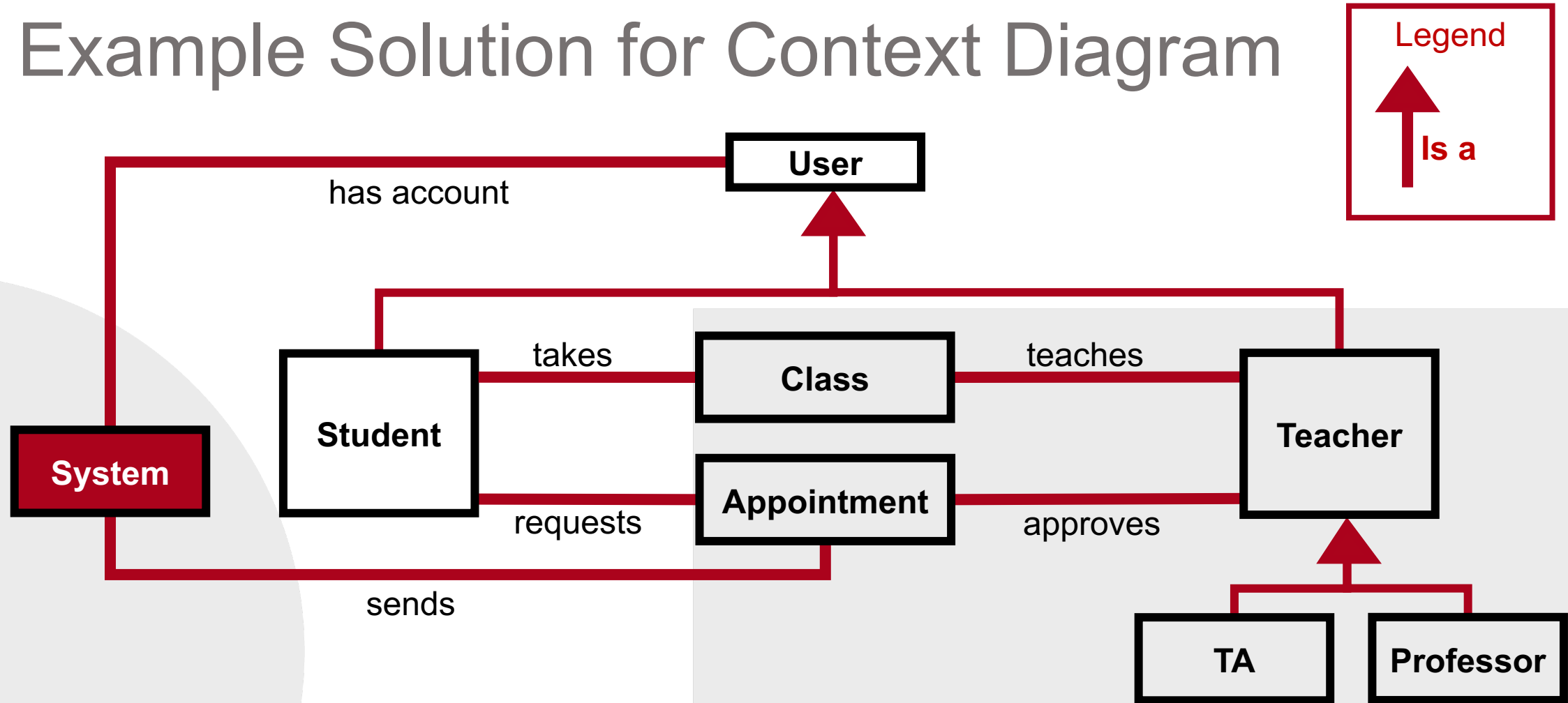


Multiplicity has been confused. This means a shape can have zero or more colors, but every color can only be helped by exactly one shape.

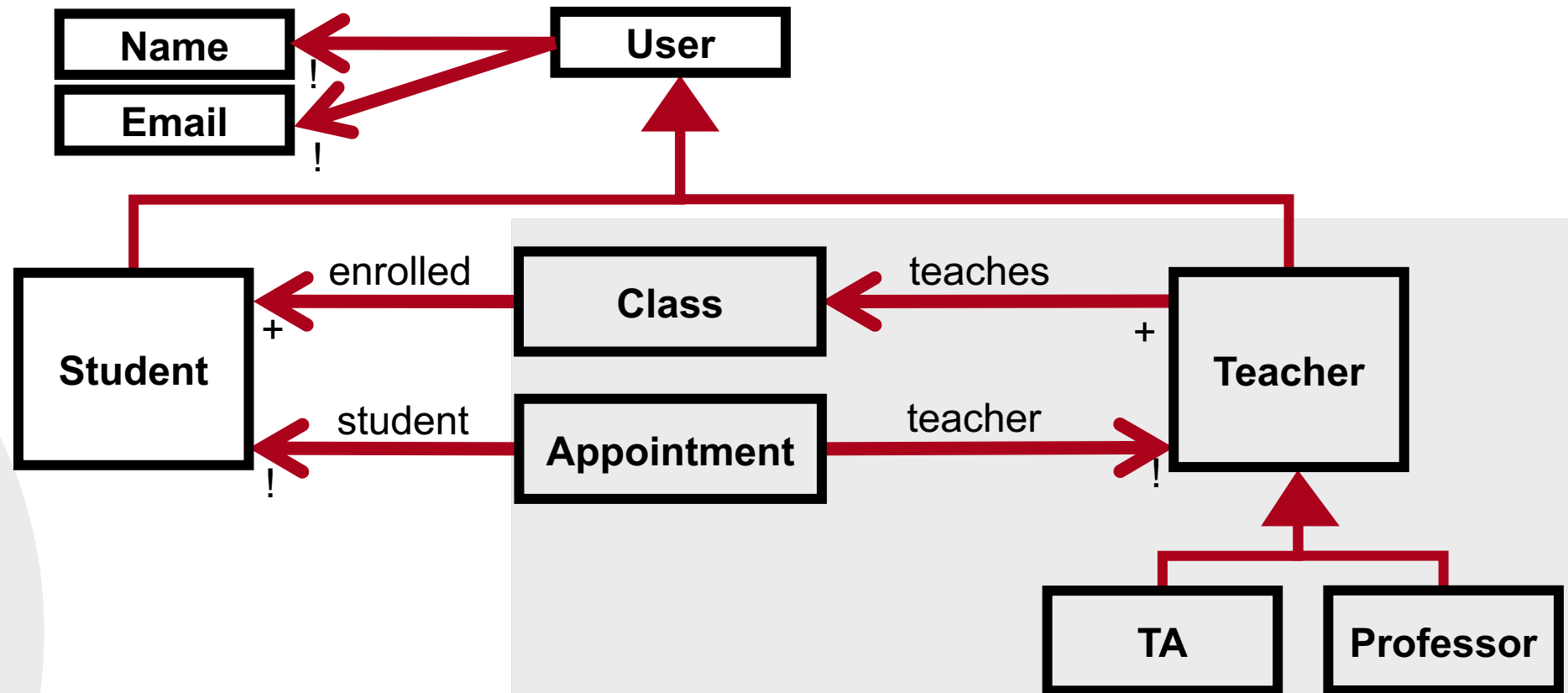
Modeling Exercise

- Model a client-server system that allows students to request appointments with professors and teaching assistants of the courses they are taking. Students can suggest 3-5 different time slots. The system sends forwards the the suggestions to the professor / TA who can select one that will then be sent to the student.
- In groups of 2-3, model a Context Diagram, Data Model, Component Diagram, and Sequence Diagram(s) for this system.

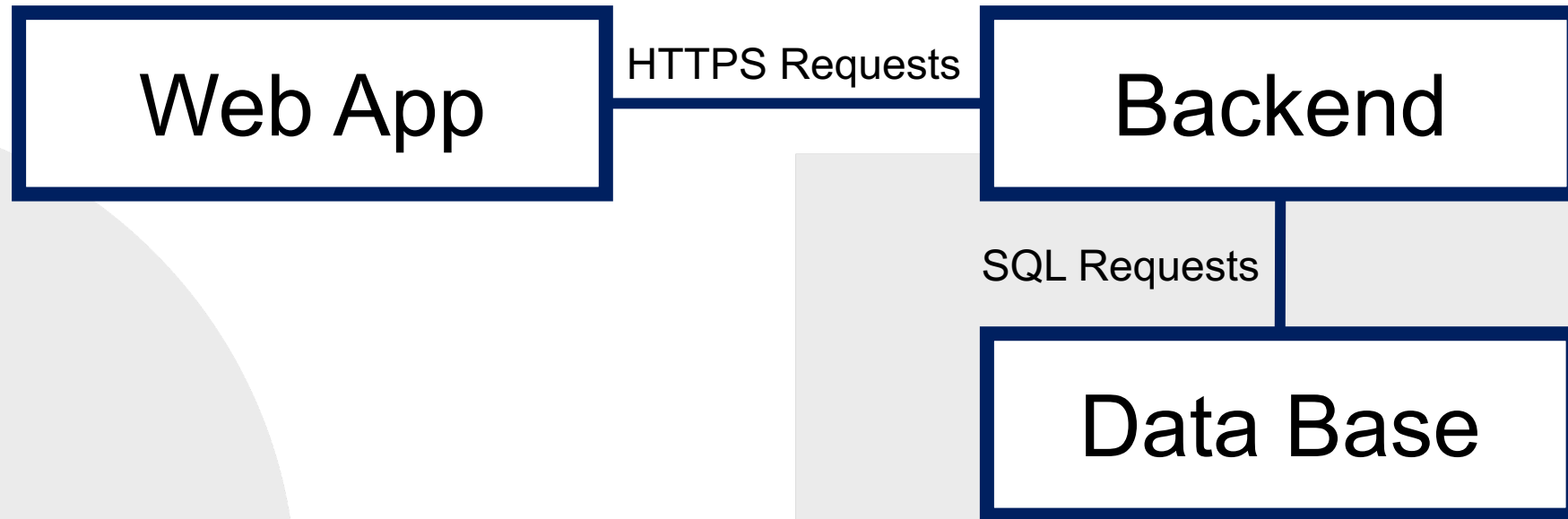
Example Solution for Context Diagram



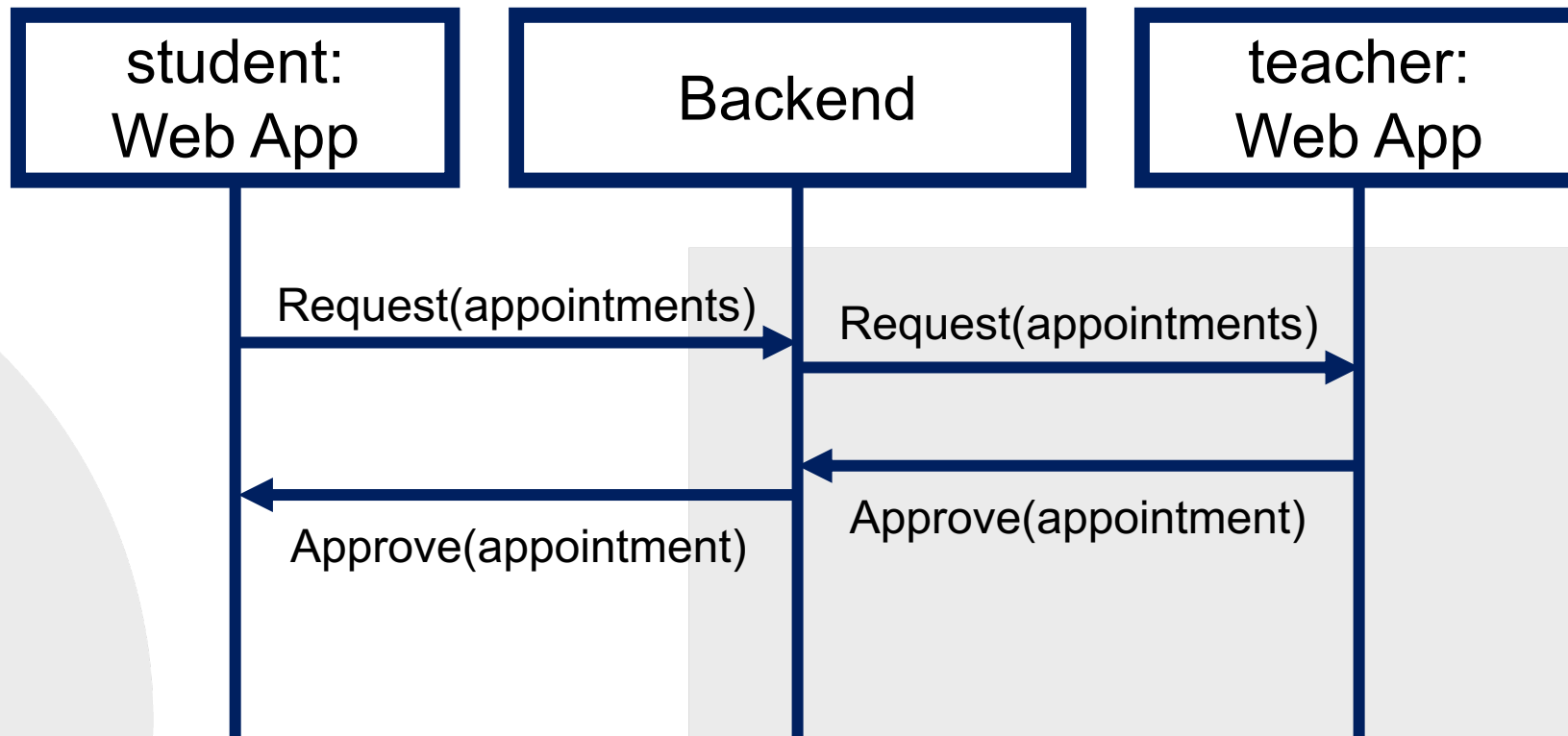
Example Solution for Data Model



Example Solution for Component Diagram



Example Solution for Sequence Diagram



Modeling Exercise Extension

- Change to the previous system: Every user can connect their calendar with the system so that only time slots can be suggested that doesn't already conflict with another meeting for either user.