

OntoUML hands-on (solutions)



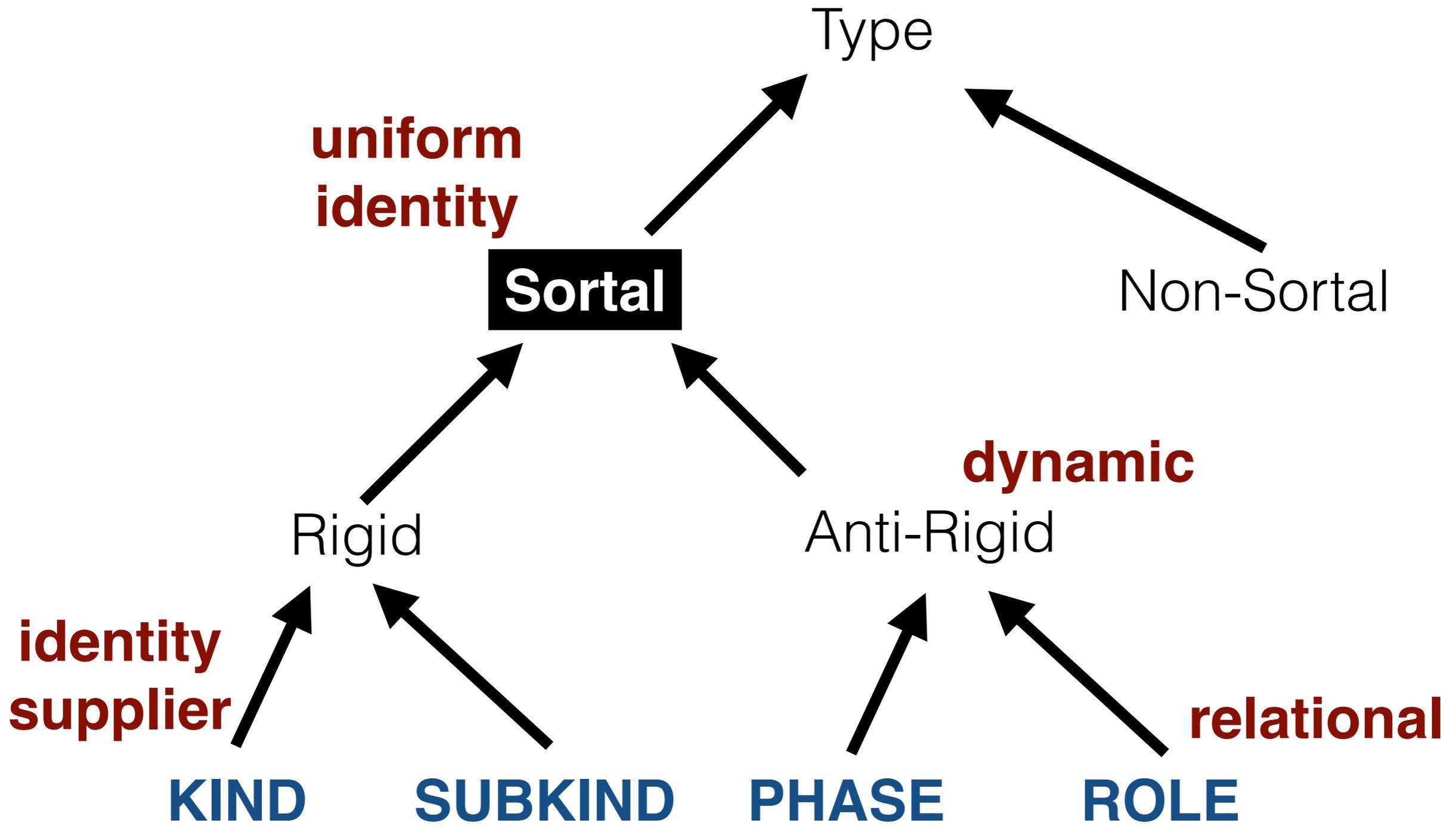
C-FORS Summer School
Oslo, 2025

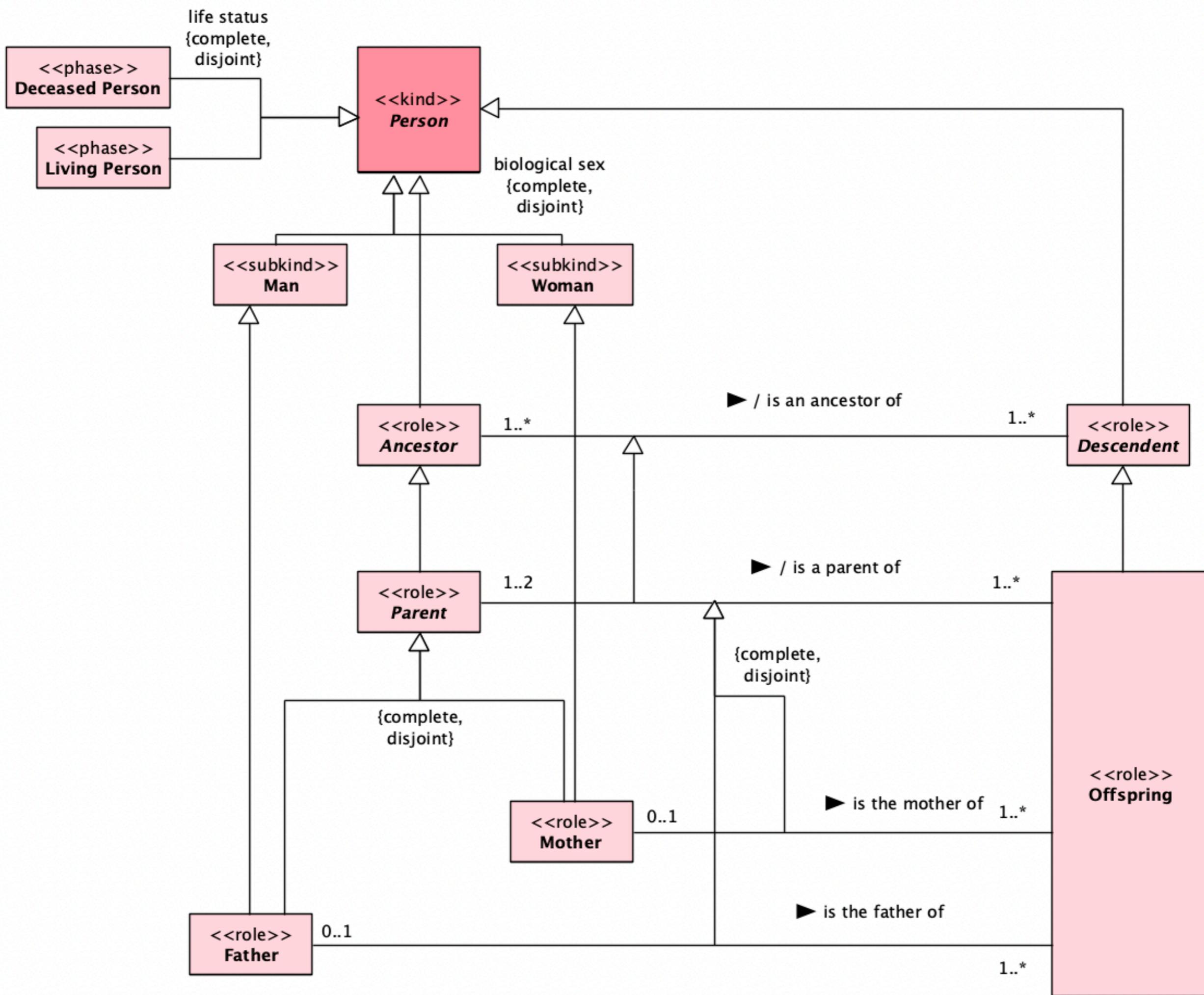
Giancarlo Guizzardi
Semantics,
Cybersecurity
& Services

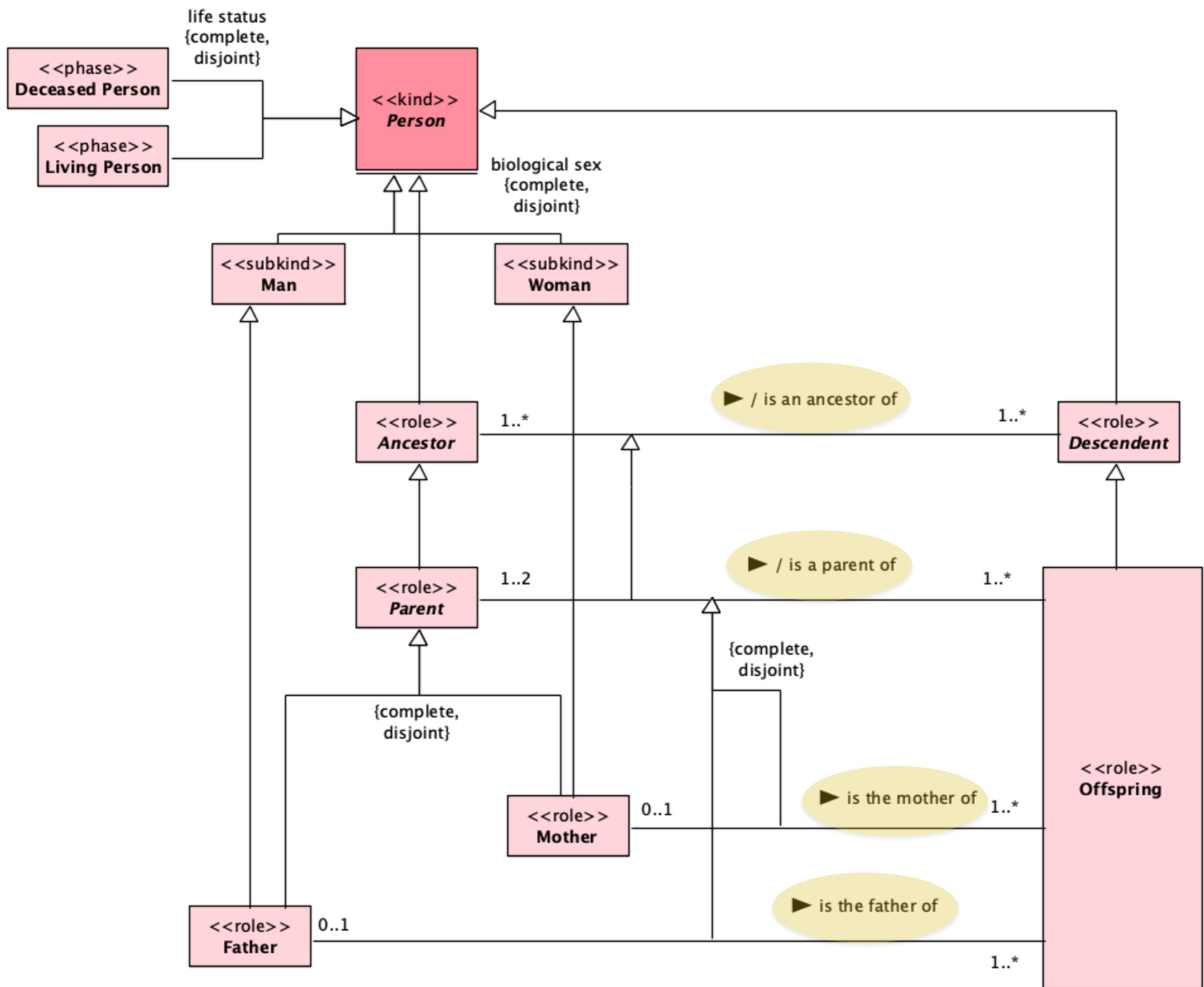
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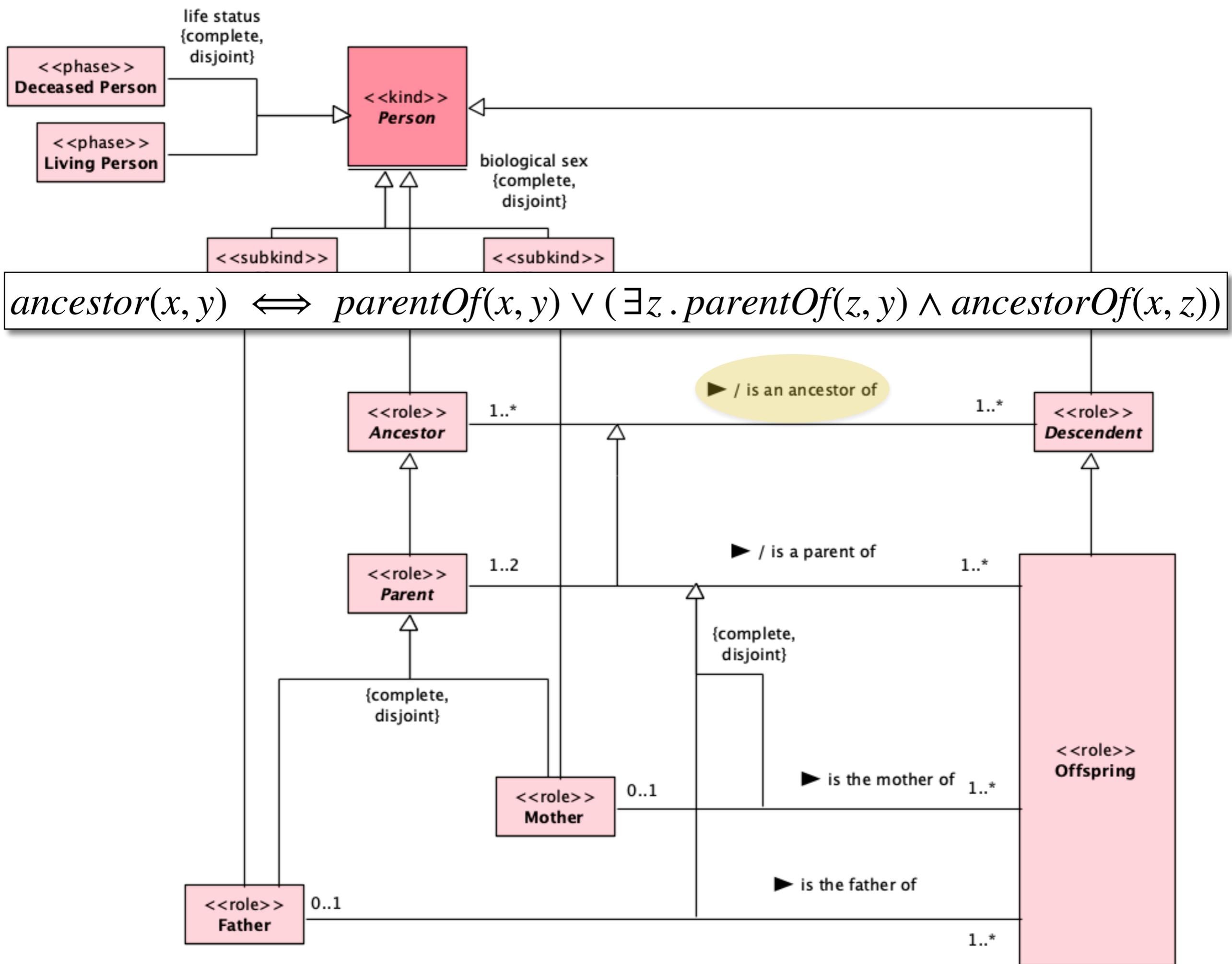


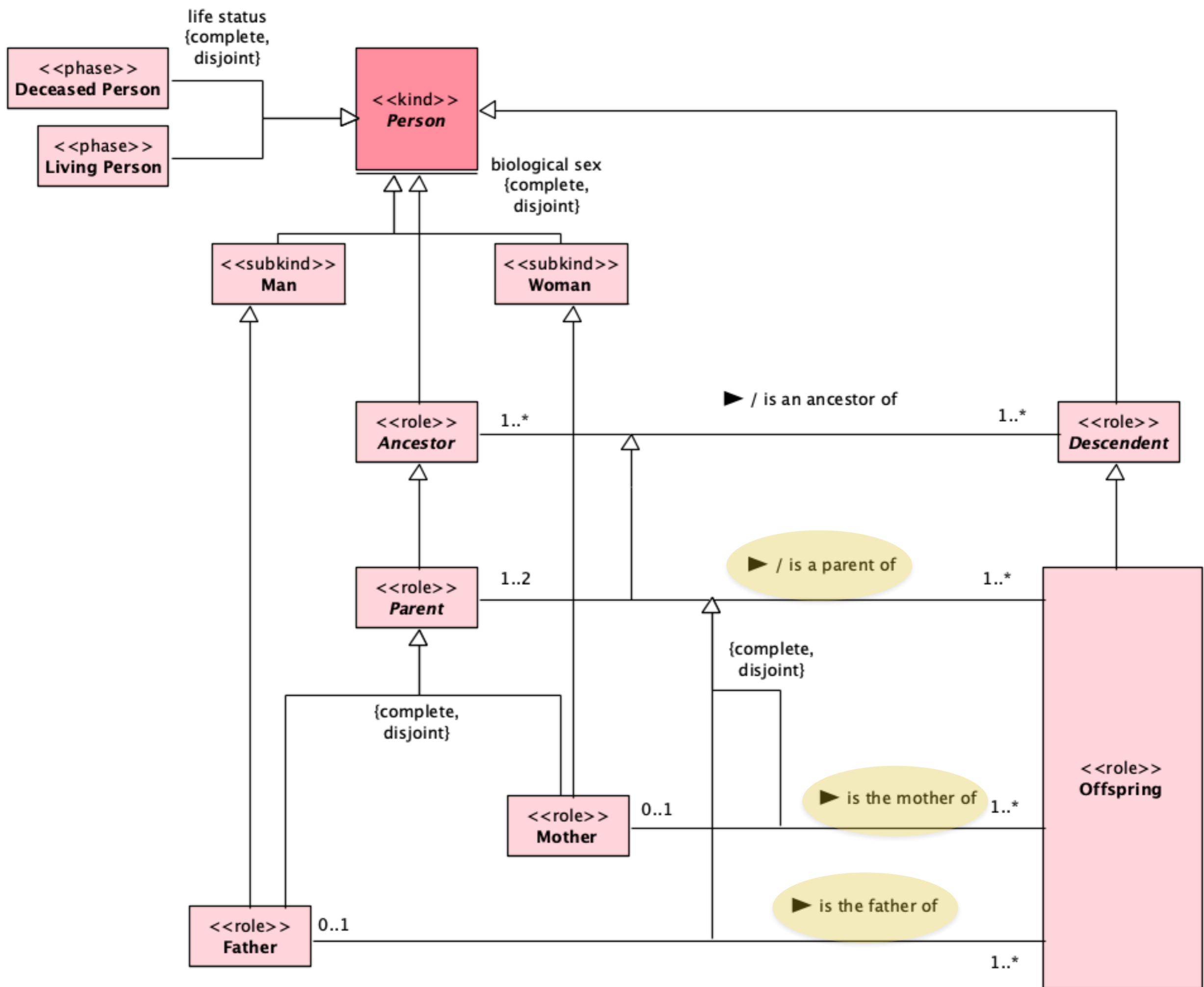
- Suppose a domain of genealogical relations. We want to represent that in this domain people can be (and have) ancestors and descendants. We are also particularly interested in direct ancestry (fathers and mothers) and direct descendants (offsprings). The notion of ancestry taken here is a legal one (as opposed to a natural notion of ancestry). Finally, we are interested to know, among those people in the domain, the ones who are living and the ones who are deceased.

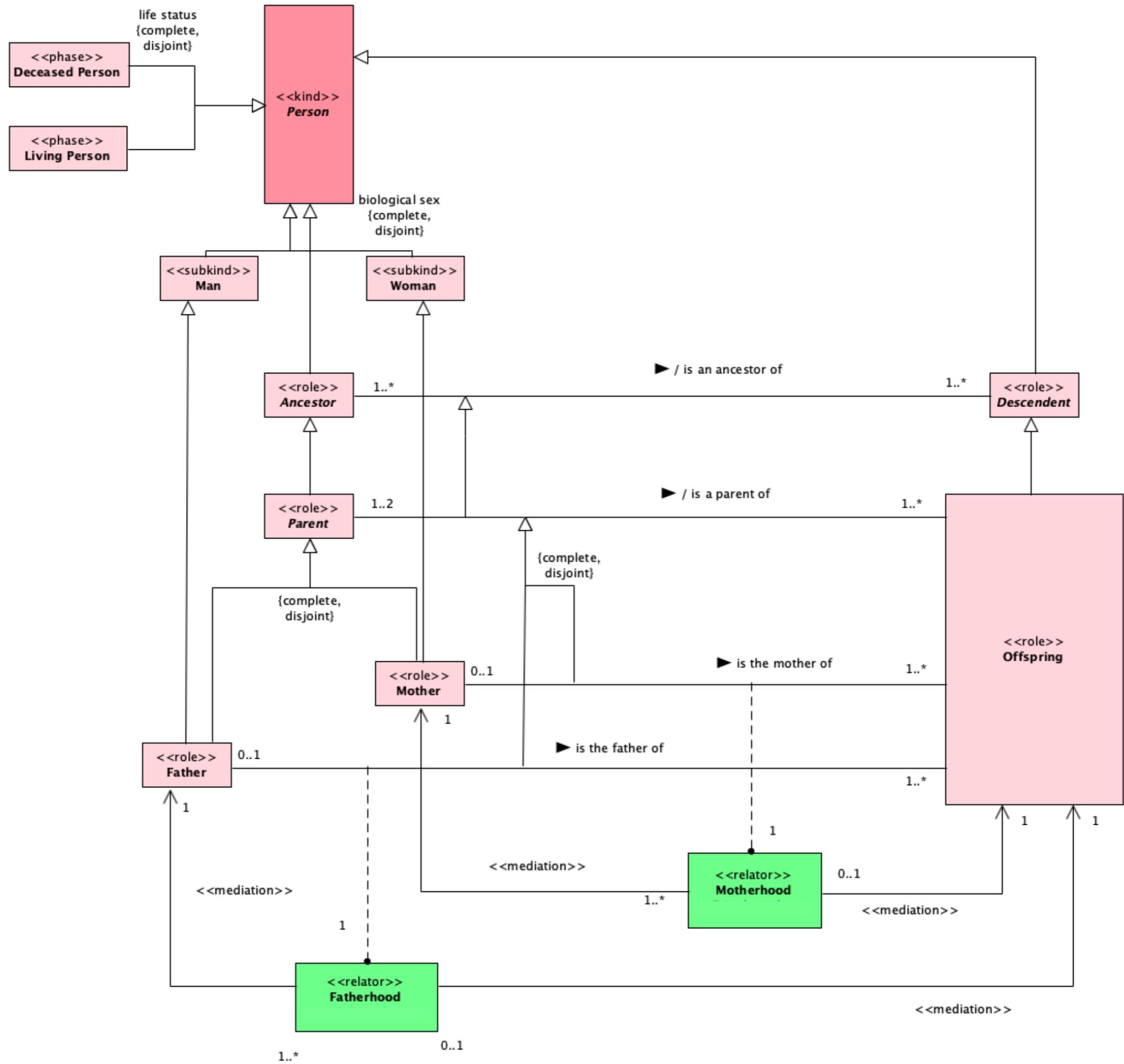


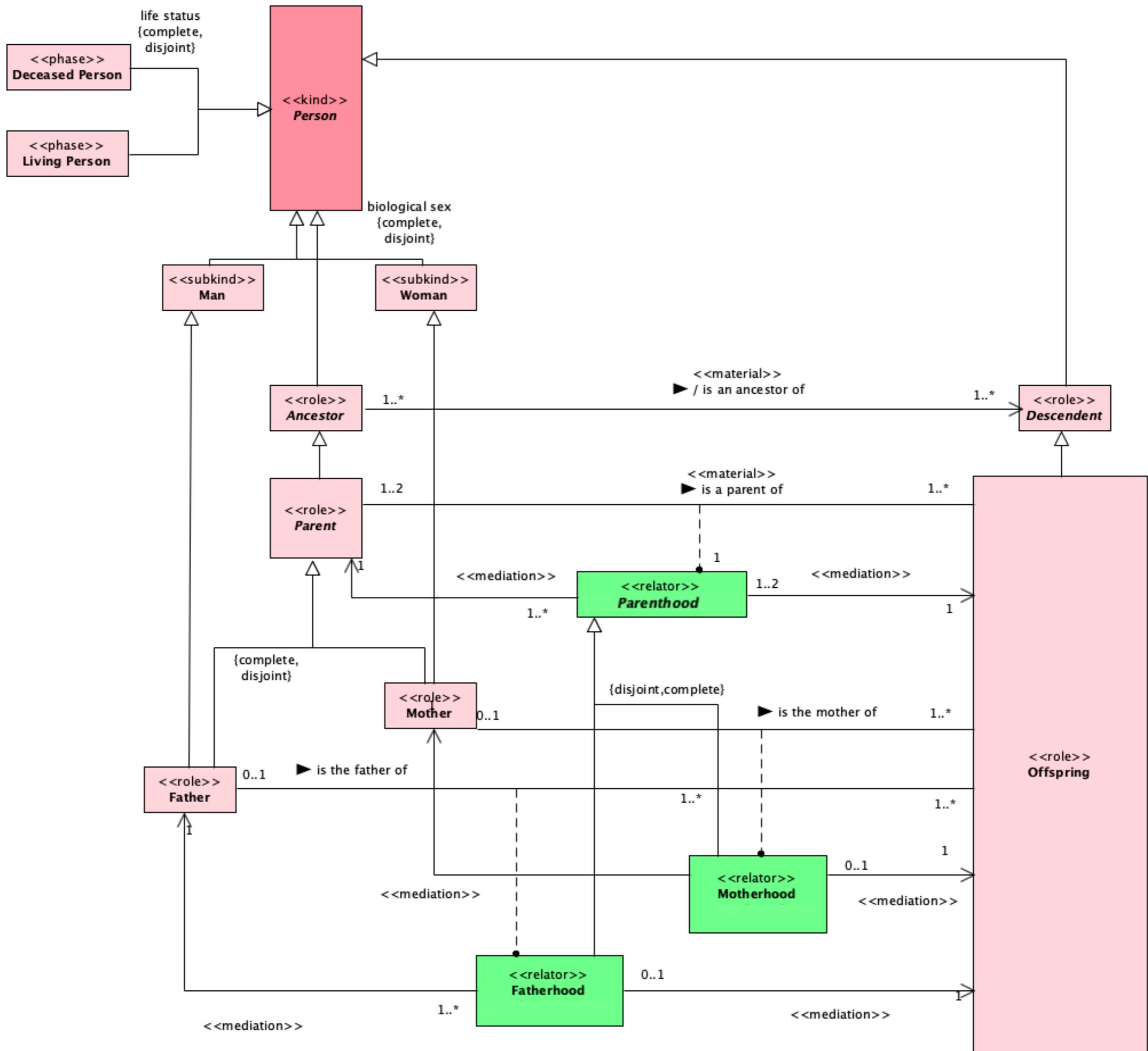


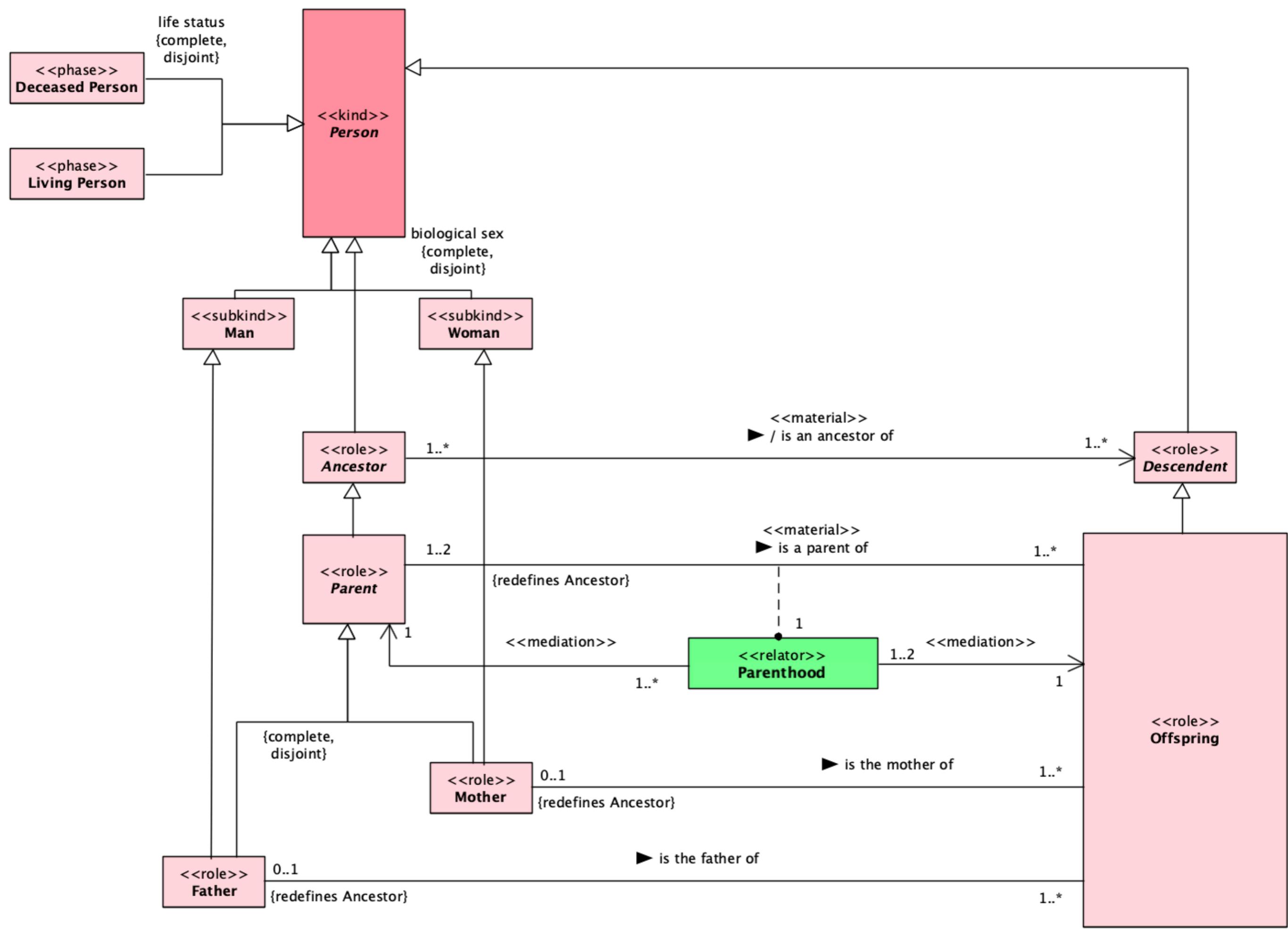


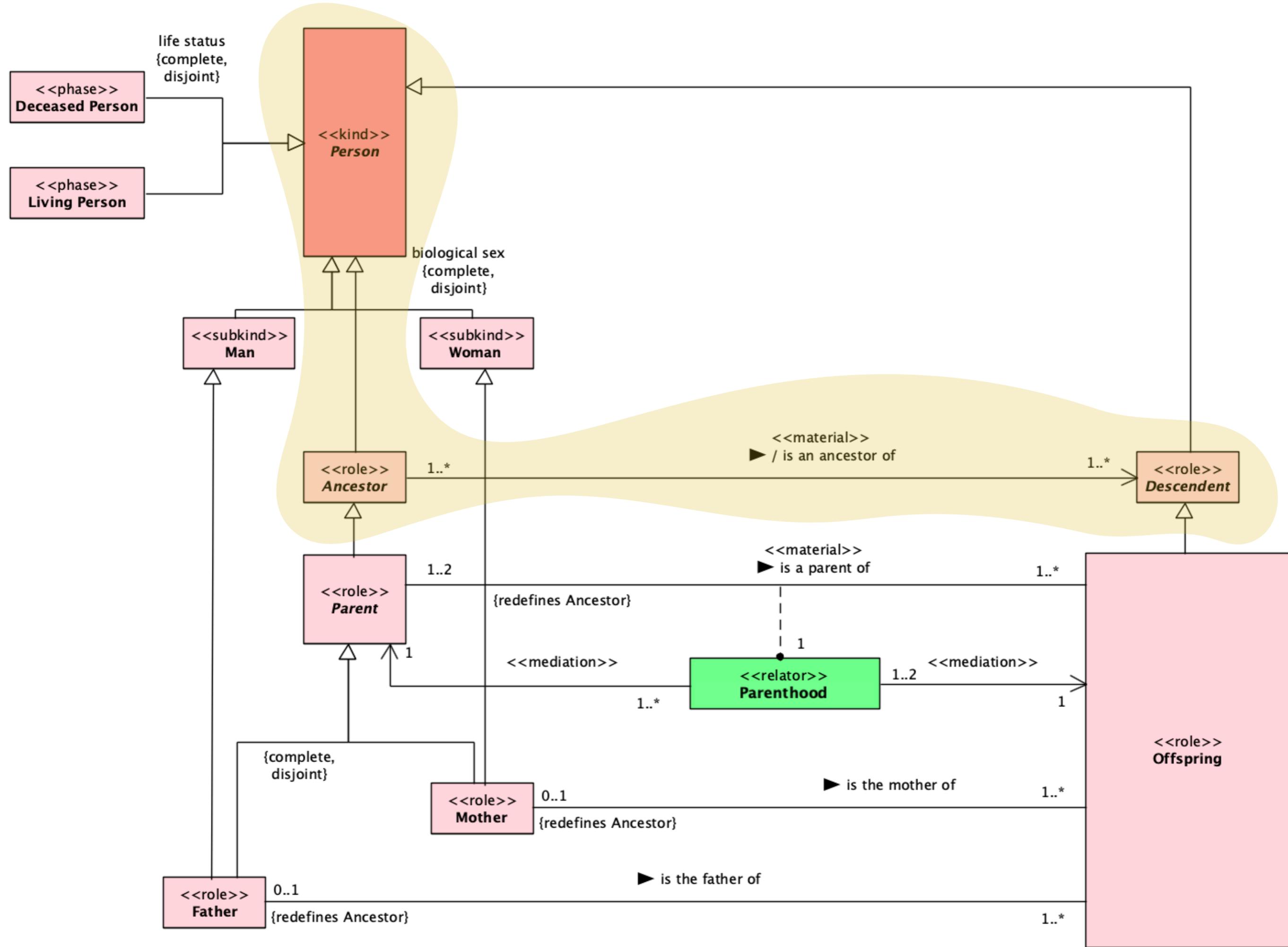


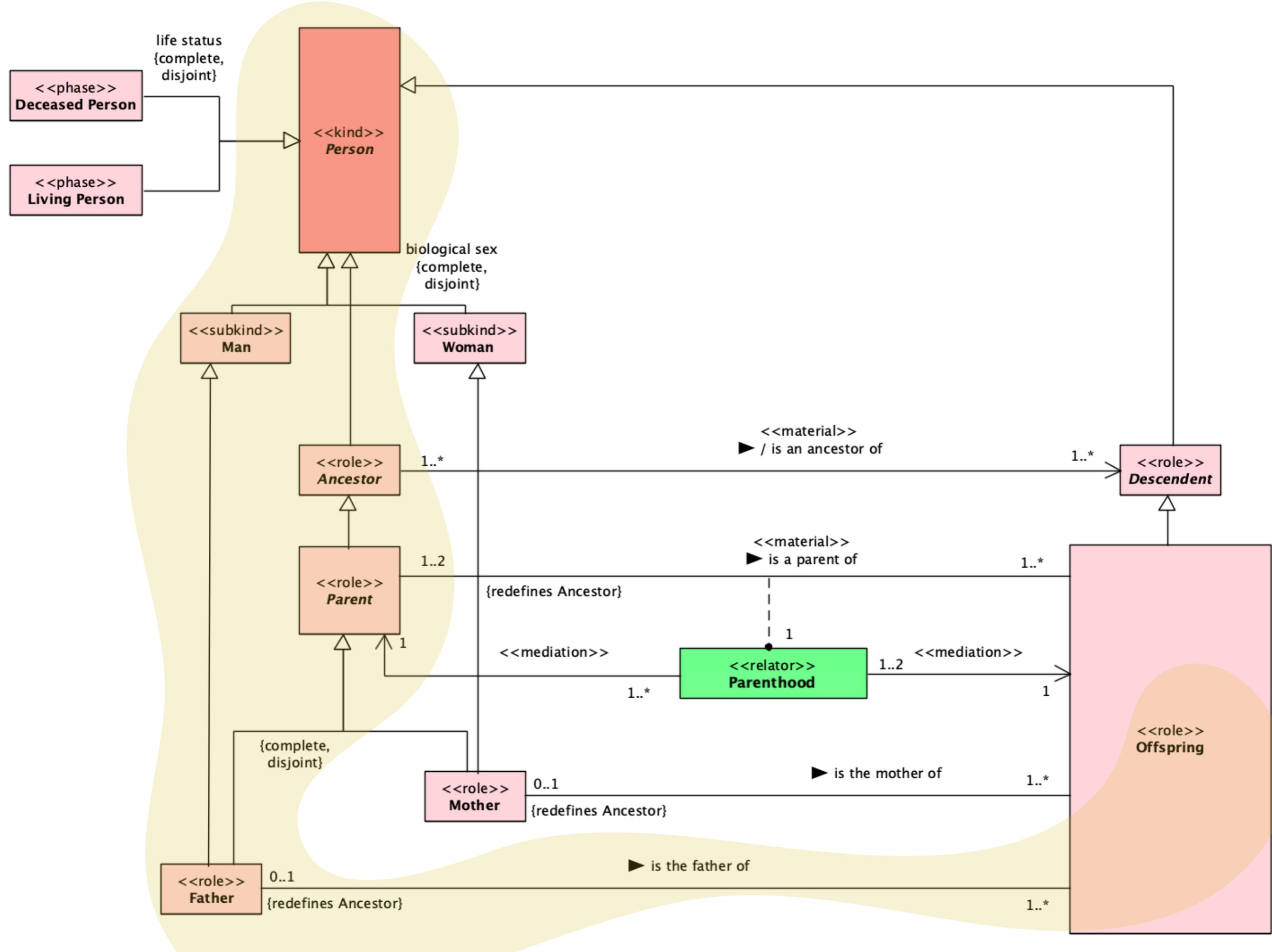


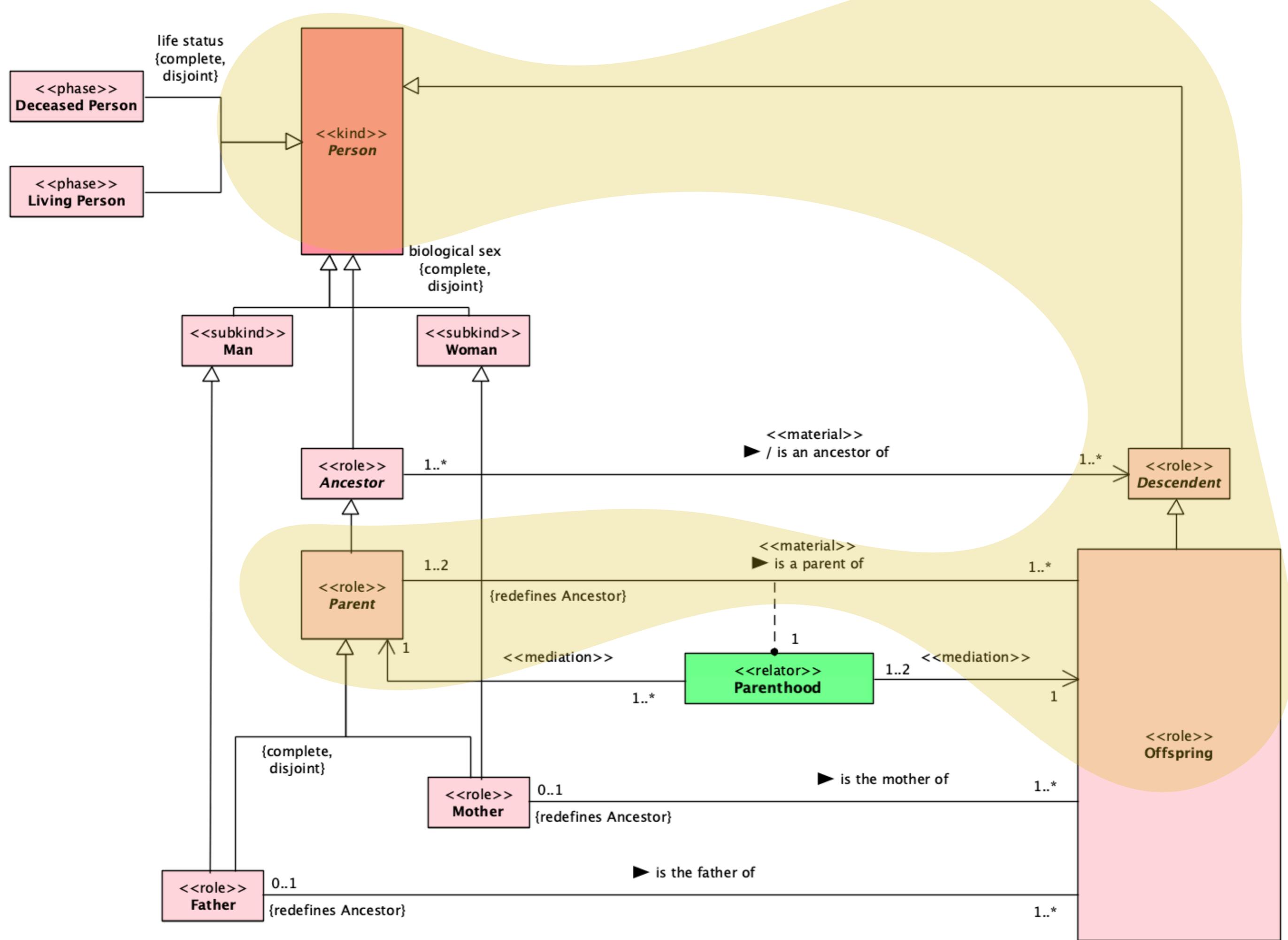


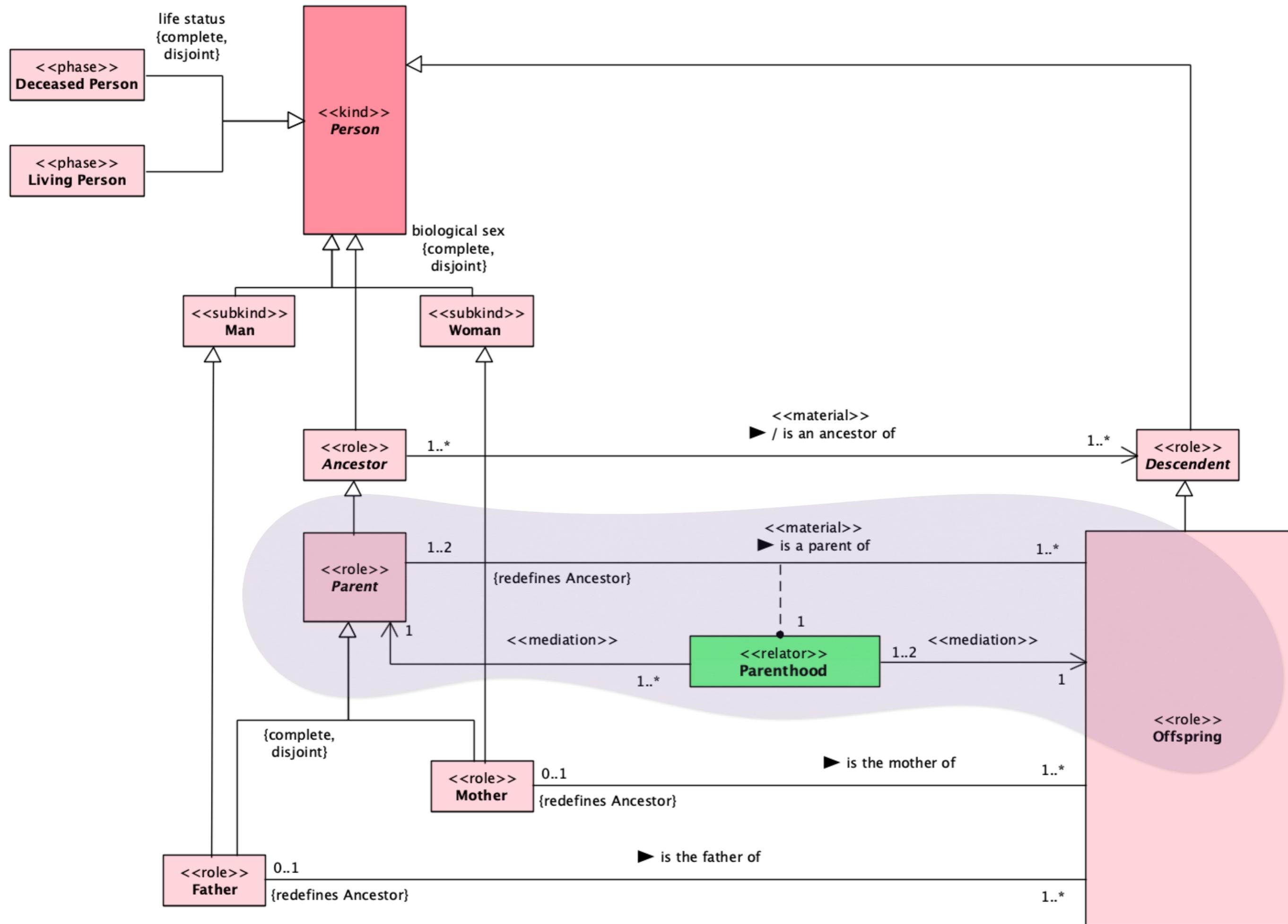


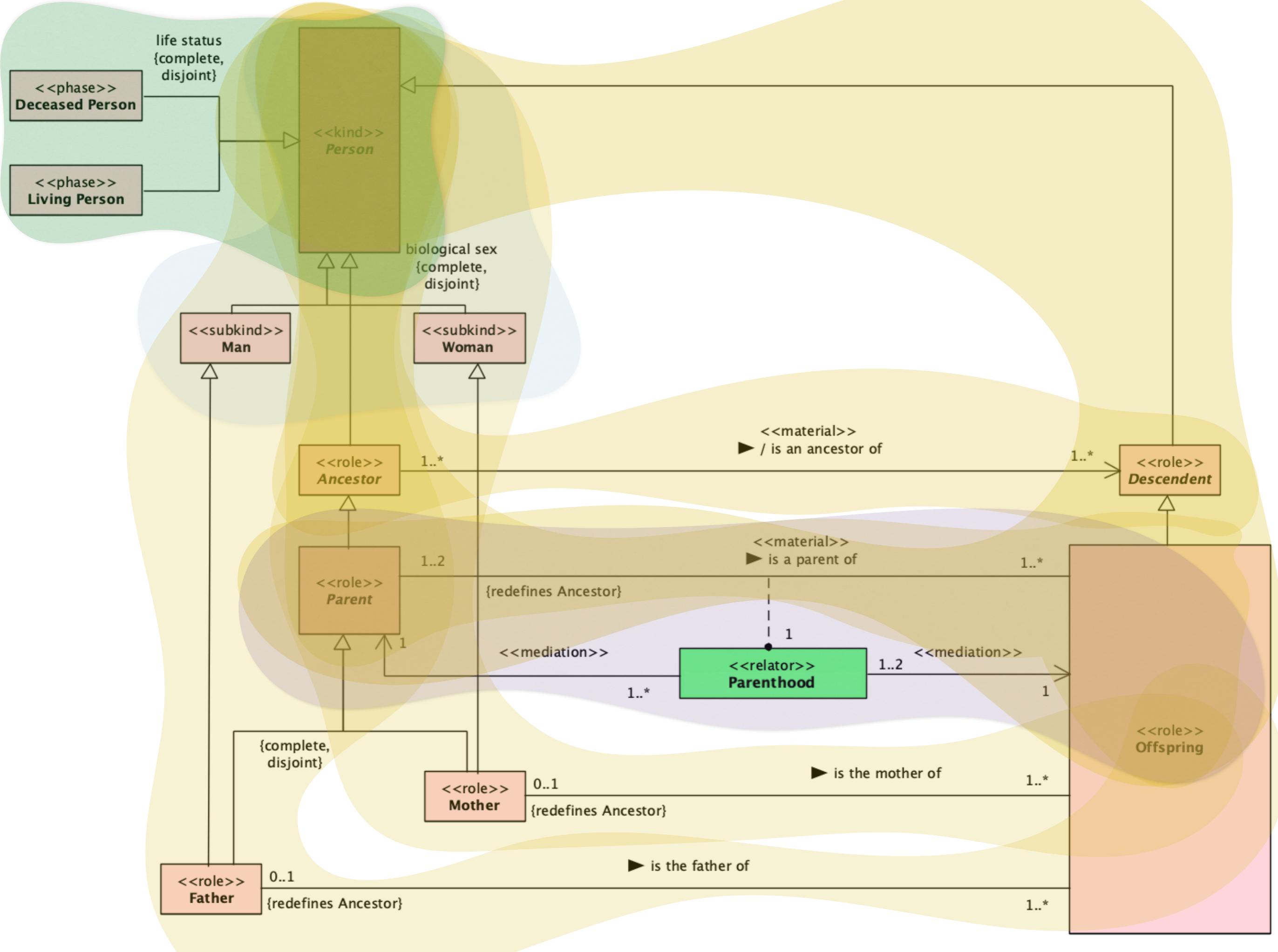












Autonomous Agents (FIBO)

- This is a model that is a simplification of a module of the **Financial Industry Business Ontology (FIBO)**
- In this domain, we have **Autonomous Agents**, which in this domain can be **Organizations, Autonomous Systems** or **Persons**
- A **Person** can be an **Adult** or a **Minor**. **Minors** can be **Emancipated**. People can be **Incapacitated**. **Capable Adults** (i.e., those who are not Incapacitated) can be legally recognised as such. Both **Legally Capable Adults** and **Emancipated Minors** are **Legally Competent Natural Persons**

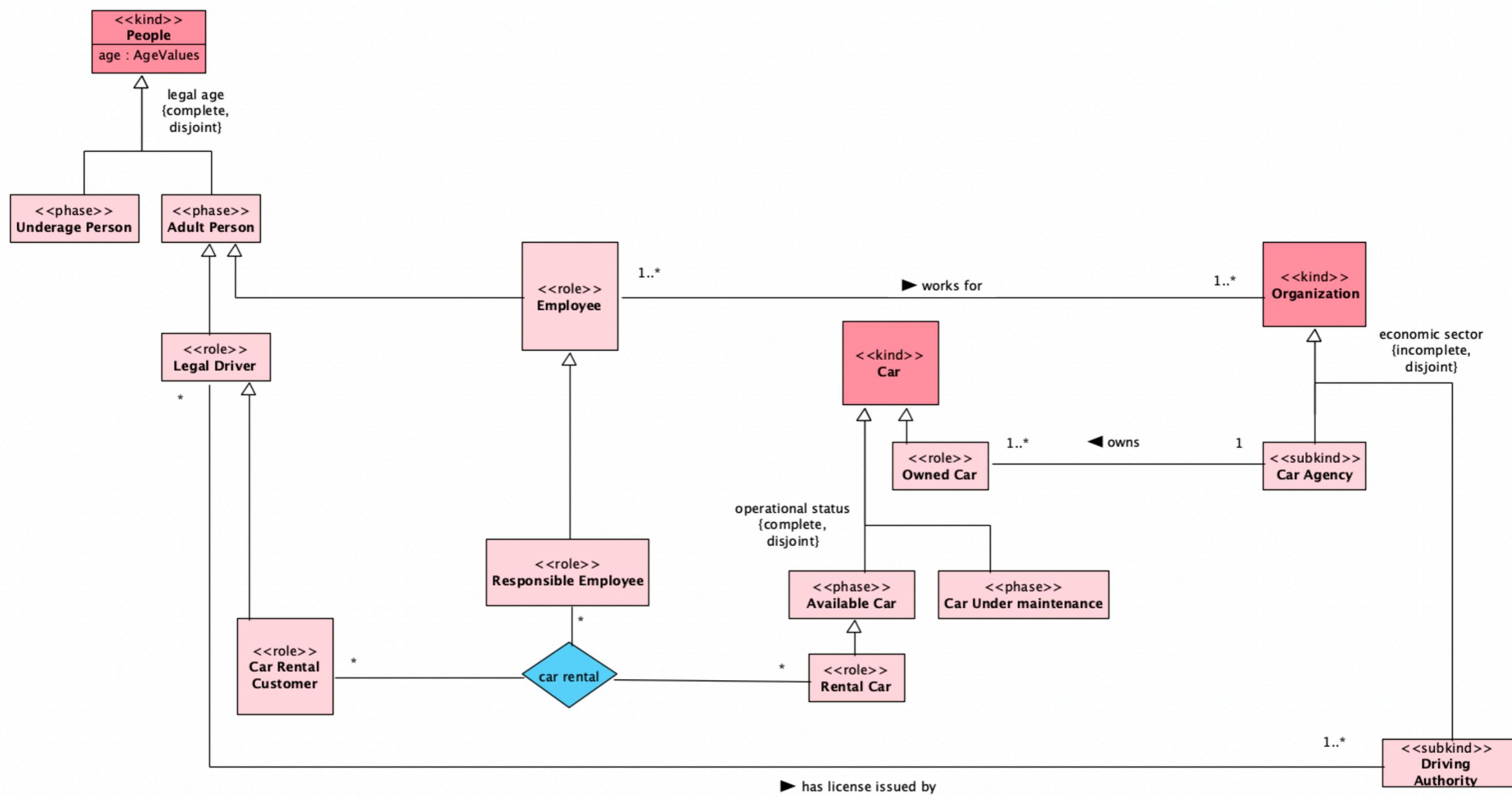
Autonomous Agents (FIBO)

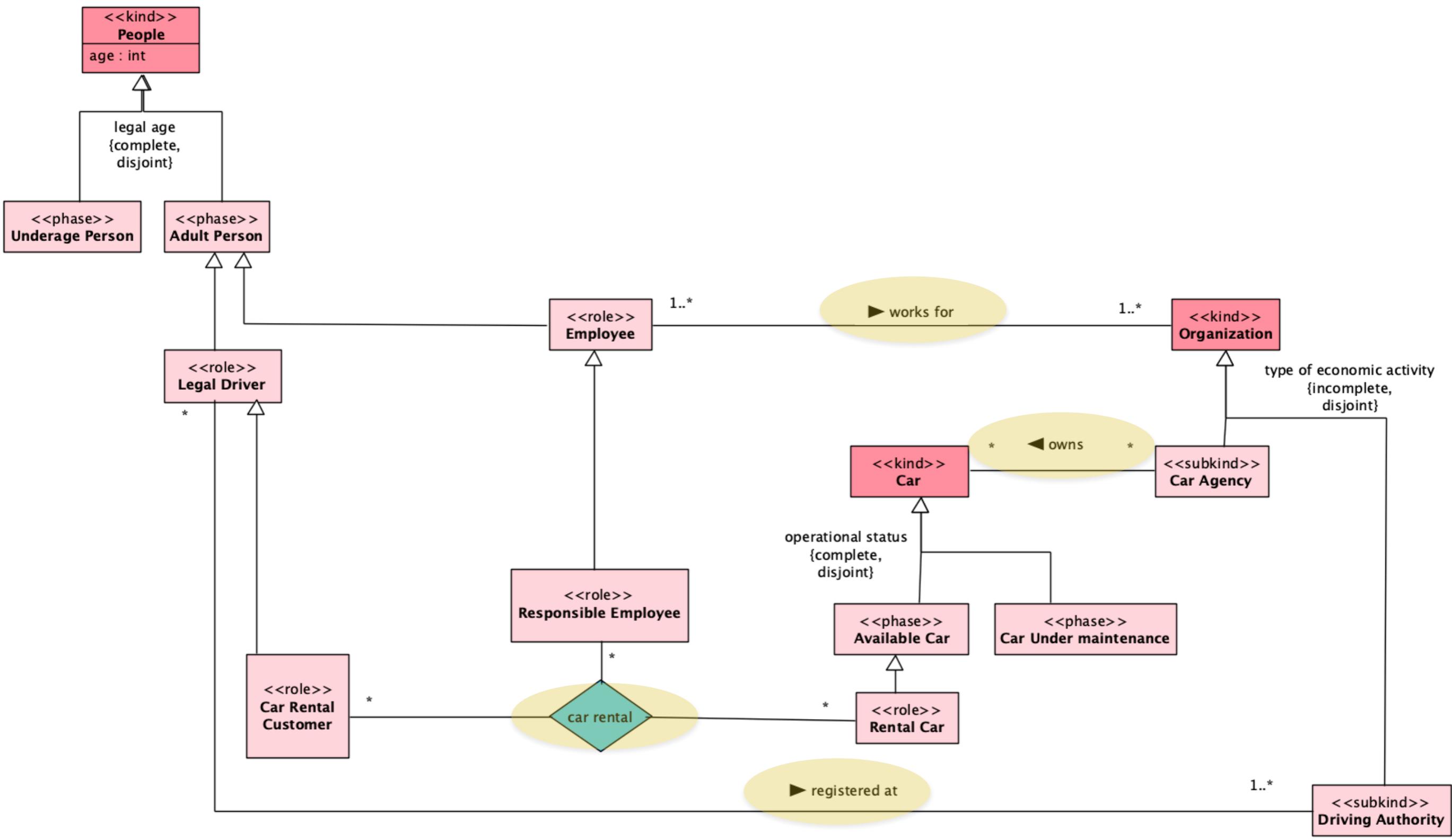
- Every Legally Competent Natural Person is a **Legal Person**, which in turn is an Autonomous Agent.
- **Organizations** can be **Informal Organizations**, **Formal Organizations**, and **Illegal Organizations** (e.g., Crime Syndicates, Illegal Cartels).
- A **Formal Organization** can be an **Organizational Subunit** (e.g., Divisions and Branches), a **Not-for-Profit Organization** (e.g., an NGO, a Religious Corporation), a **Government Body** or a **Private Company**.

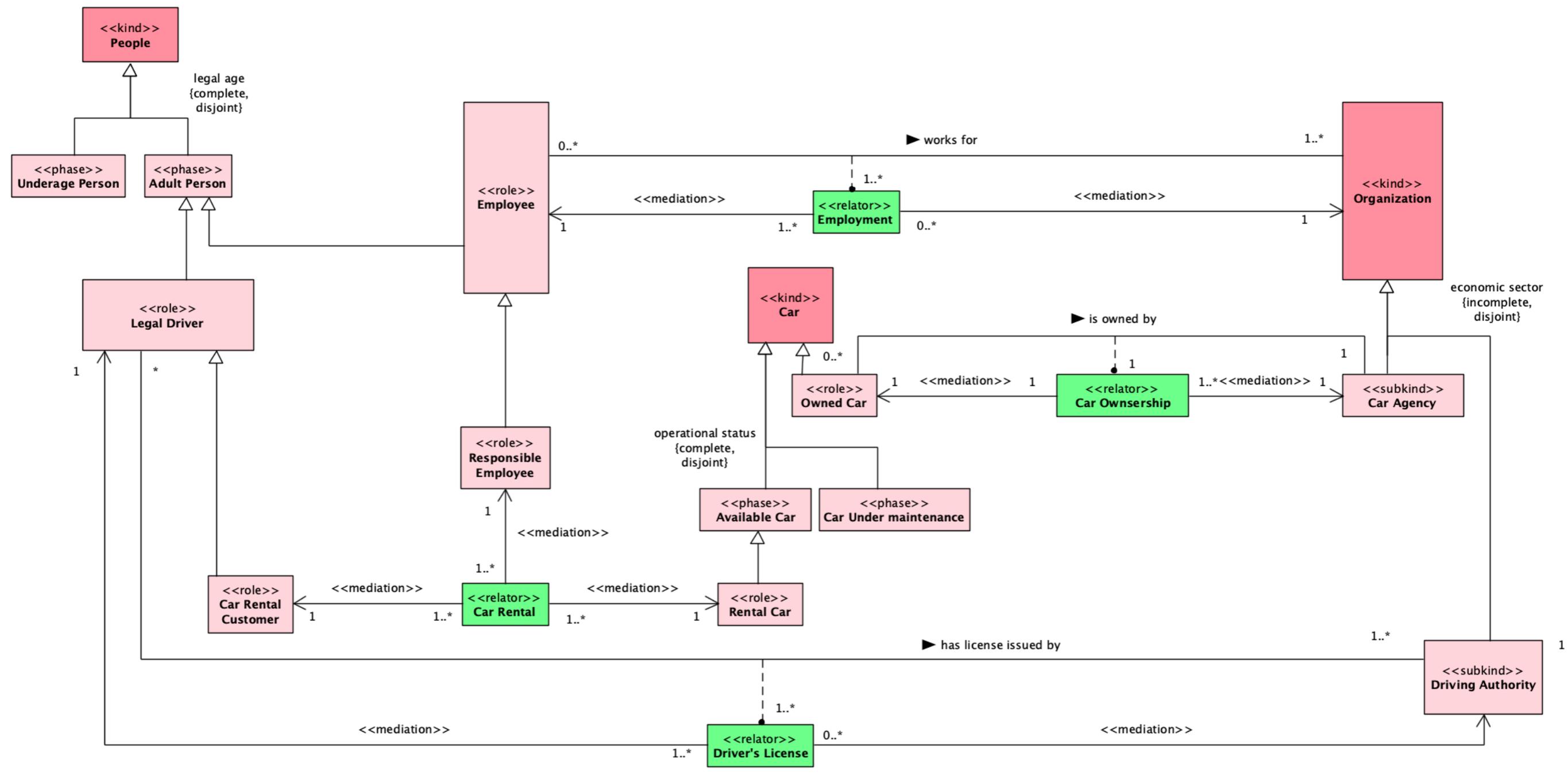
Autonomous Agents (FIBO)

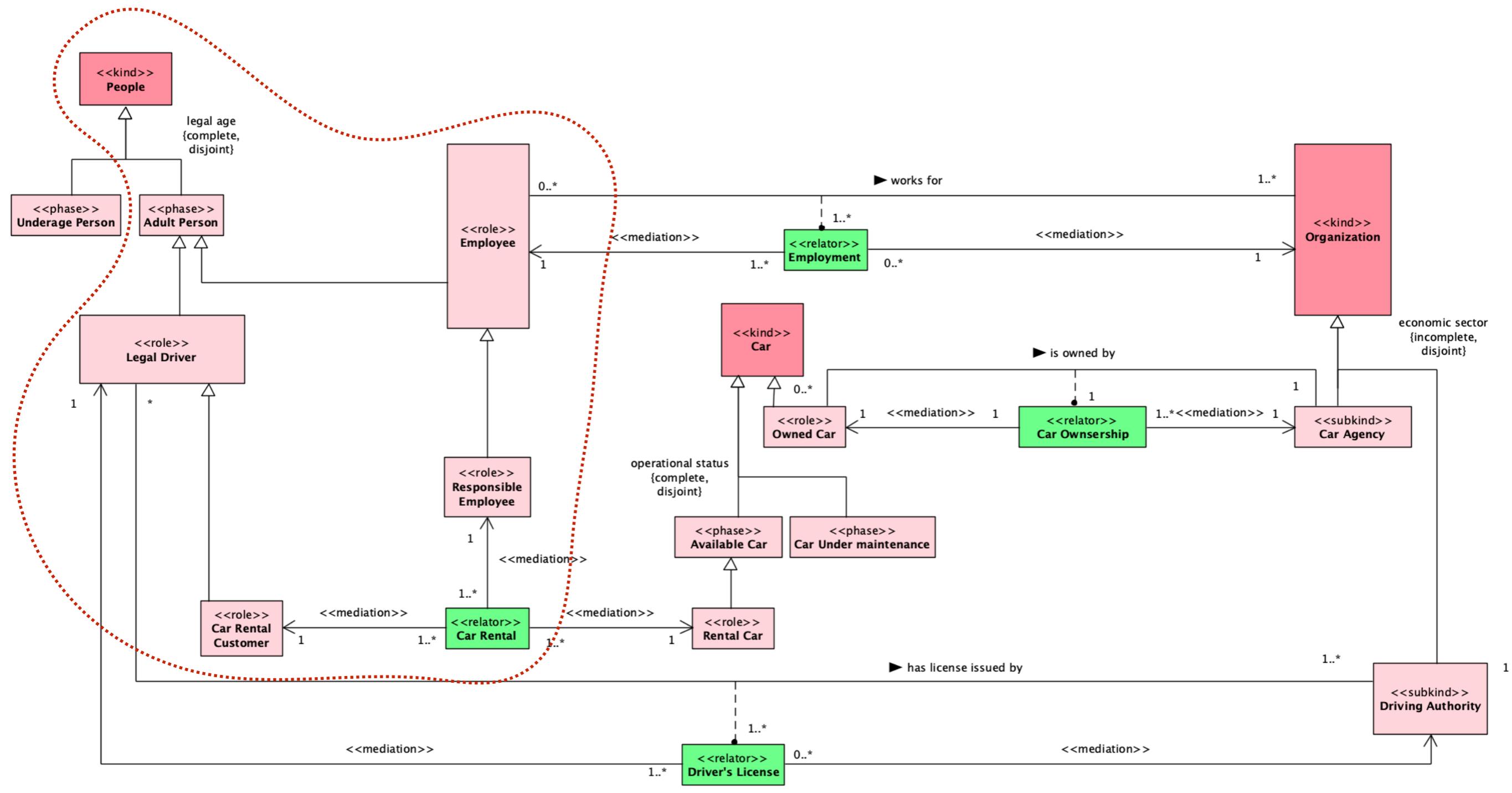
- A **Government Body** can be a **Branch of Government** (i.e., Executive, Legislature or Judiciary branch), a **Government Agency**, a **Government Department**, or a **Polity**.
- A Polity can be a **Sovereign State** (including a Federated Sovereignty), **Municipal Entity**, **Regional Sovereignty** or a **Supranational Entity**.
- All **Government Bodies** are **Legal Persons** and so are **Private Companies** and **Not-for-Profit Organization**.

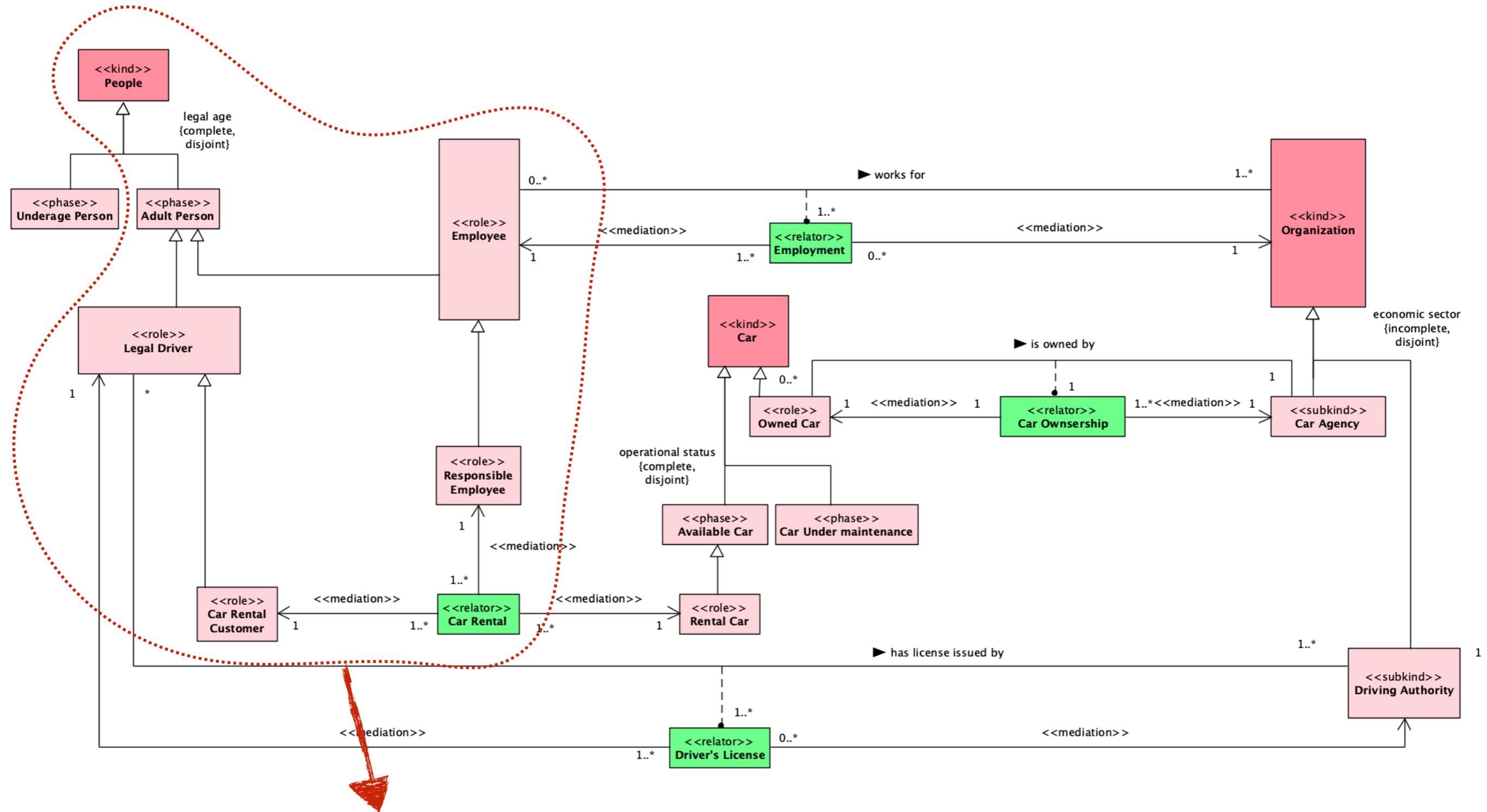
- Suppose a car rental domain, in which people can become clients of car rental agencies by renting cars owned by these agencies. Car rental customers are legal drivers which, in turn, must be adult persons. Every rental connects a customer to a car but also to a responsible employee, i.e., an employee of the car rental agency that is responsible for authorising that rental. Cars can be available or under maintenance. Only available cars can be rented.





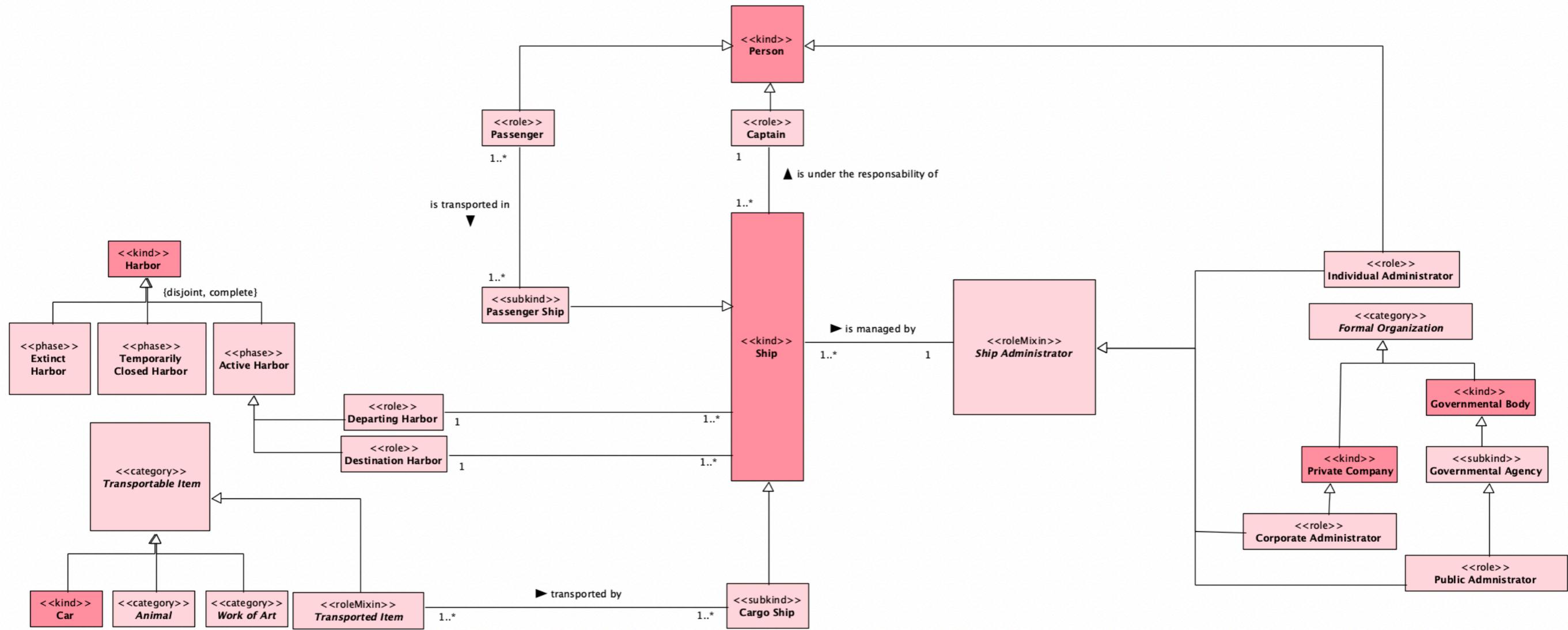


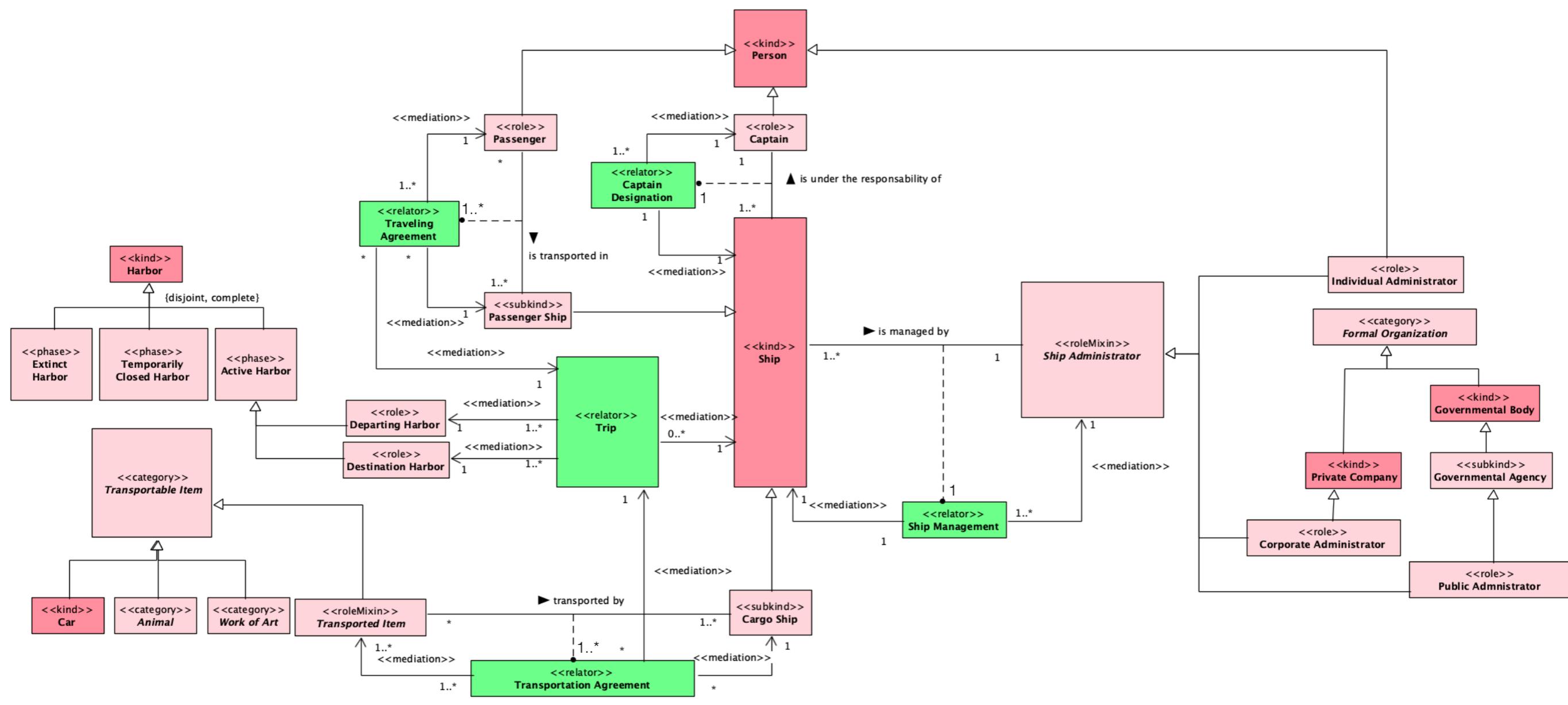


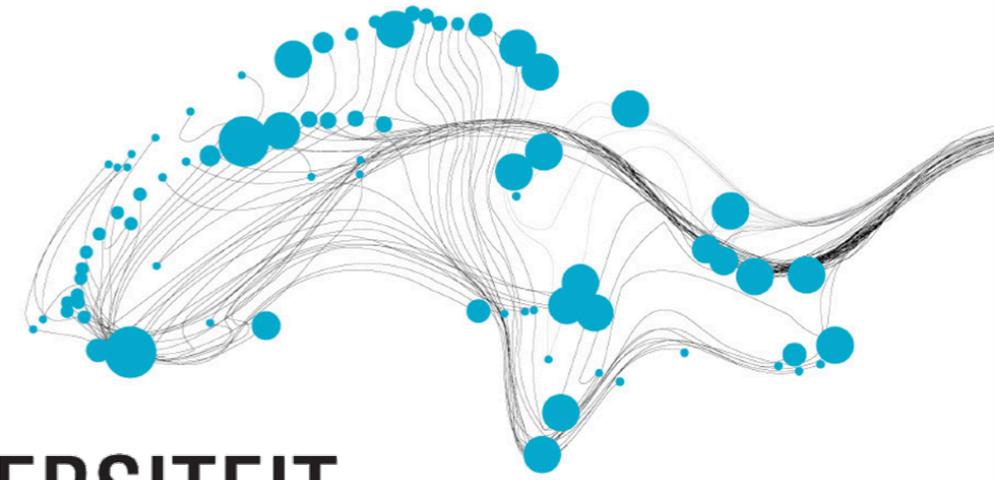
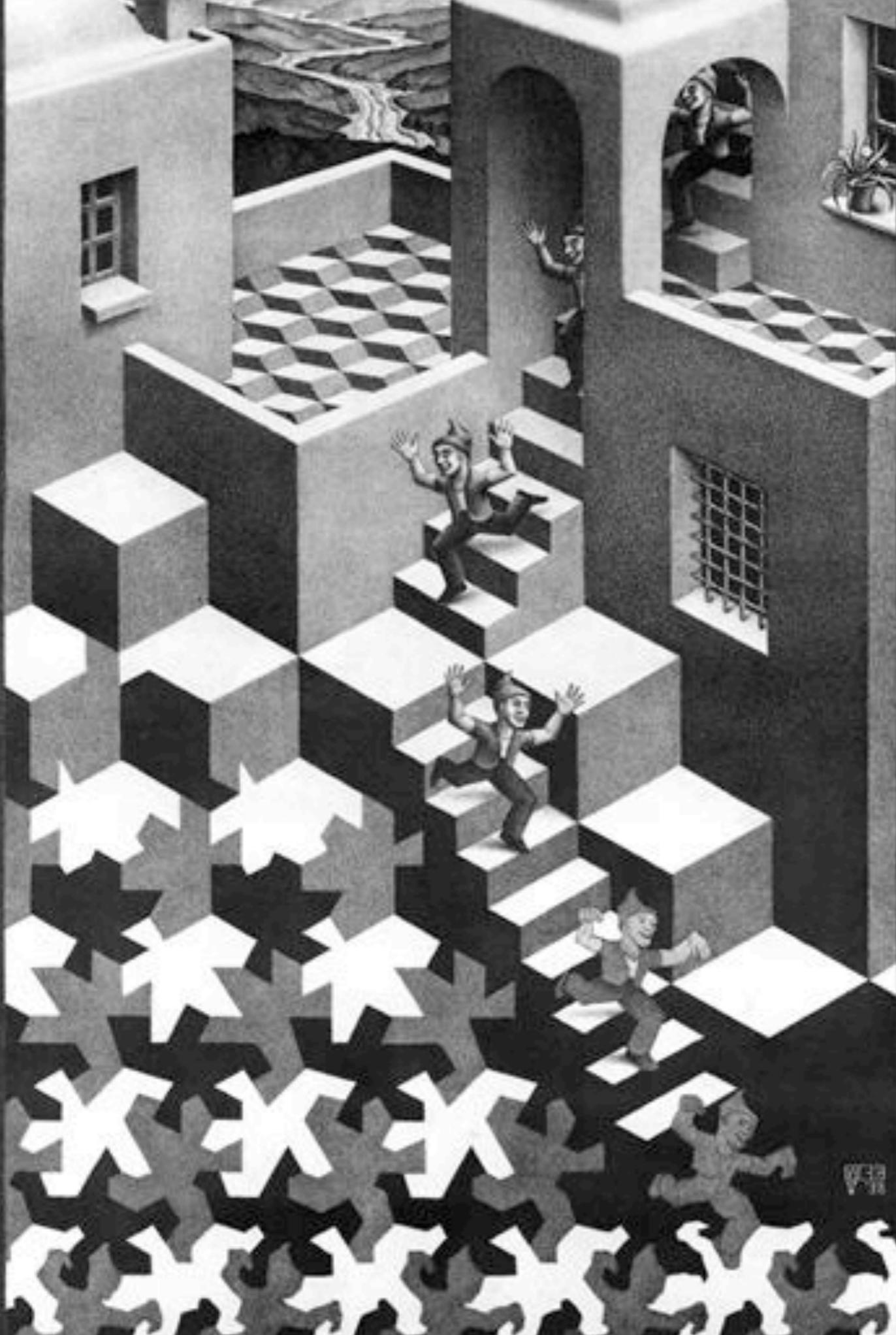


$$\forall x, y, z. CarRental(x) \wedge CarRentalCustomer(y) \wedge ResponsibleEmployee(z) \wedge mediates(x, y) \wedge mediates(x, z) \rightarrow (y \neq z)$$

- Consider the domain of Sea Transportation. In this domain, you can have two basic types of Ships, namely, Passenger Ship or Cargo Ship. Ships are connected to exactly a departing harbor and a destination harbor. Harbors can be active, under maintenance (temporarily close) or extinct. For each ship, there is a designated captain and an administrator (which can be either a natural person, a private company, or a governamental agency). Passenger Ships transport people as passengers; Cargo Ships can transport items as diverse as Cars, Animals or Works of Art.







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