

Draw an entity-relationship diagram that describes the following business environment.

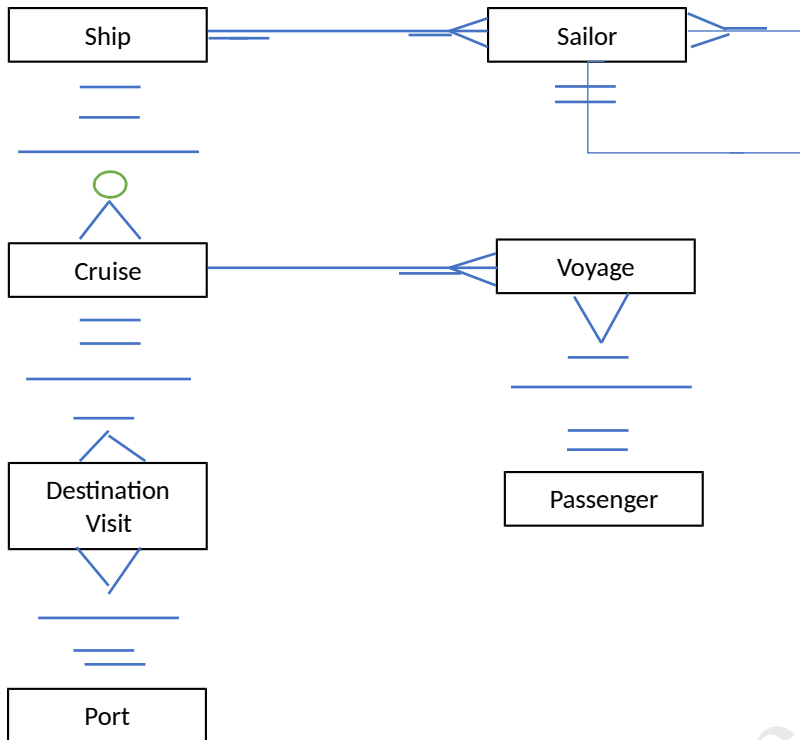
Happy Cruise Lines has several ships and a variety of cruise itineraries, each involving several ports-of-call. The company wants to maintain information on the sailors who currently work on each of its ships. It also wants to keep track of both its past and future cruises and of the passengers who sailed on the former and are booked on the latter.

Each ship has at least one and, of course, normally many sailors on it. The unique identifier of each ship is its ship number. Other ship attributes include ship name, weight, year built, and passenger capacity. Each sailor has a unique sailor identification number, as well as a name, date-of-birth, and nationality. Some of the sailors are in supervisory positions, supervising several other sailors. Each sailor reports to just one supervisor. A cruise is identified by a unique cruise serial number. Other cruise descriptors include a sailing date, a return date, and a departure port (which is also the cruise's ending point.) Clearly, a cruise involves exactly one ship; over time a ship sails on many cruises, but there is a requirement to be able to list a new ship that has not yet sailed on any cruises, at all. Each cruise stops at least one and usually several ports-of-call, each of which is normally host to many cruises, over time. In addition, the company wants to maintain information about ports that it has not yet used in its cruises but may use in the future. A port is identified by its name and the country that it is in. Other information about a port includes its population, whether a passport is required for the passengers to disembark there, and its current docking fee, which is assumed to be the same for all ships. Passenger information includes a unique passenger number, name, home address, nationality, and date-of-birth. A cruise typically has many passengers on it (certainly at least one). Hoping for return business, the company assumes that each passenger may have sailed on several of its cruises (and/or may be booked for a future cruise.) For a person to be of interest to the company, he or she must have sailed on or be booked on at least one of the company's cruises. The company wants to keep track of how much money each passenger paid for (or will pay for) each of their cruises, as well as their satisfaction rating of the cruise, if it has been completed.

Business Rules

1. Each ship has at least one and, of course normally many sailors on it.
2. Some sailors are supervisors and supervise several other sailors.
3. Each sailor reports to one supervisor.
4. A cruise involves exactly one ship.
5. Each cruise ship stops at least one and usually several ports-of-call.
6. Each port-of-call host many cruises over time.
7. A cruise typically has many passengers (at least one).
8. For a person to be of interest to the company he or she must've sailed on or be booked on at least one of the company's cruises.
9. Track how much money each passenger paid or will pay for their cruise.
10. Track passenger satisfaction rating of cruise (if it's been completed).

Entity	Primary Key
Ship	Ship Number
Sailor	Sailor Number
Cruise	Cruise Number
Passenger	Passenger Number
Port	Port Name/Country
Destination Visit	Cruise Num/Port Name
Voyage	Passenger/Cruise Num



Ship		Sailor		Cruise	
Ship Num	PK	Sailor Num	PK	Cruise Num	PK
Name		Name		Date Sailed	
Weight		DOB		Date Returned	
Year Built		Nationality		Departure Port	
Passenger Capacity		Supervisor Num			

Passenger		Port	
Passenger Num	PK	Port Name	PK
Name		Country	PK
Address		Population	
DOB		Passport Requirement	
Nationality		Docking Fee	

Voyage		Visit	
Passenger Num	PK FK	Cruise Num	PK FK
Cruise Num	PK FK	Port Name	PK FK
Price paid		Country	FK
Satisfaction Rating			