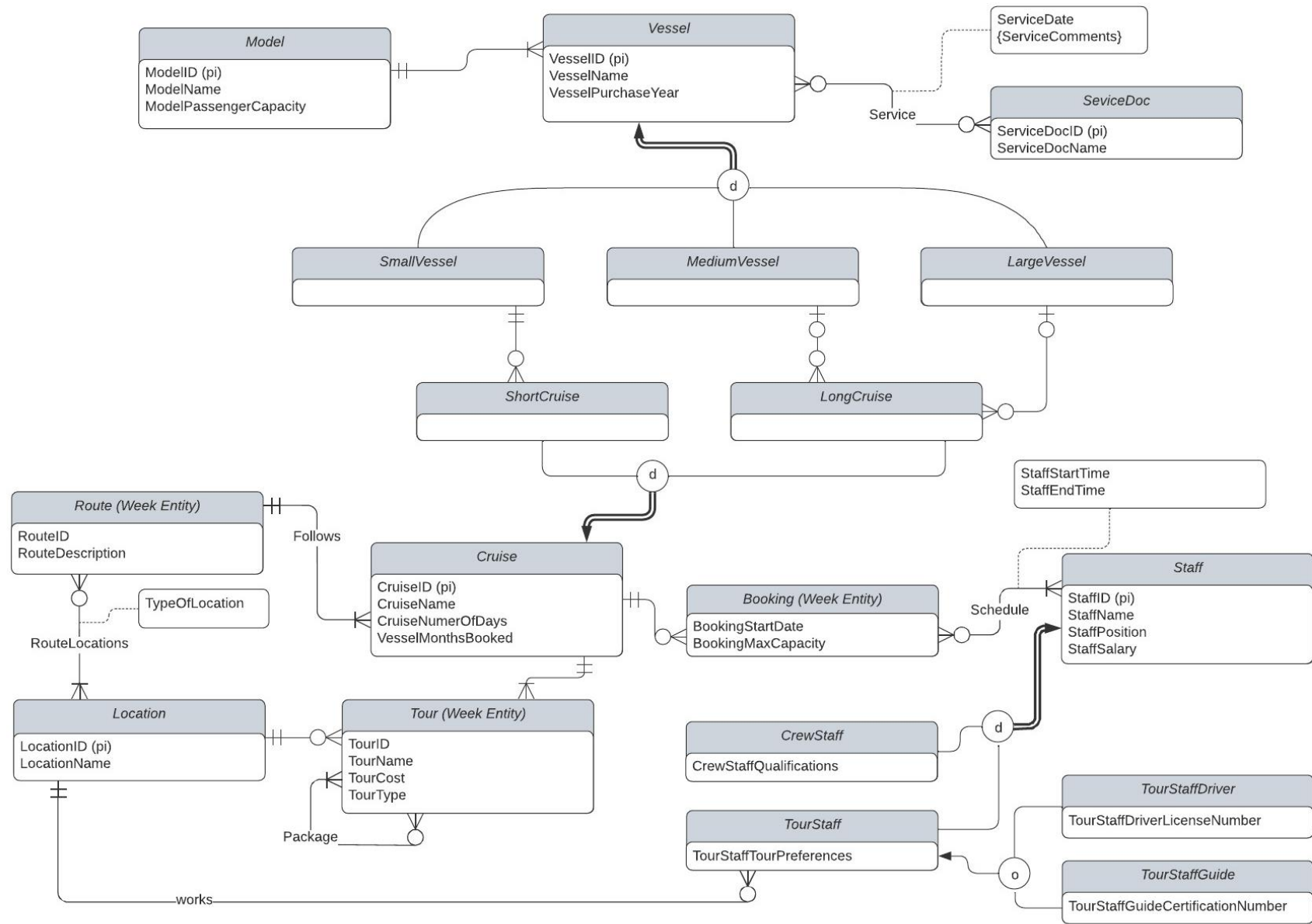


## Task 1: EER Diagram

### Assumptions, if any:

- The tour staff assistant can be created as tour staff, the supertype, because it won't have any extra attributes like a driver's licence or certification number.
- The number of months a vessel is booked for a cruise is an argument of the cruise entity. Every cruise will need to have a Vessel.
- The "TypeOfLocation" attribute states if the location stored is the source, destination, or stopover location.
- Each cruise can only have one vessel, but the vessel can be used for multiple cruises.
- A cruise can have multiple bookings.



## Task 2: Logical Transformation

PK = Underline

FK = *Red*

### Step 1: Strong Entities

VESSEL(VesselID, VesselName, VesselPurchaseYear)

LONGVESSEL(VesselID, VesselName, VesselPurchaseYear)

MODEL(ModelID, ModelName, ModelPassengerCapacity)

SERVICEDOC(ServiceDocID, DerviceDocName)

CRUISE(CruiseID, CruiseName, CruiseNumberOfDays, VesselMonthsBooked)

STAFF(StaffID, StaffName, StaffPosition, StaffSalary)

LOCATION(LocationID, LocationName)

### Step 2: Week Entities

ROUTE(*CruiseID*, RouteID, RouteDescription)

TOUR(*CruiseID*, TourID, TourName, TourCost, TourType)

BOOKING(*CruiseID*, BookingStartDate, BookingMaxCapacity)

### Step 3: 1:1 relationship

There are no 1:1 relationships

### Step 4: 1:N relationship

VESSEL(VesselID, VesselName, VesselPurchaseYear, *ModelID*)

TOUR(*CruiseID*, TourID, TourName, TourCost, TourType, *LocationID*)

### Step 5: M:N relationship

SERVICE(*VesselID*, *ServiceDocID*, ServiceDate)

ROUTELOCATIONS(*LocationID*, *CruiseID*, *RouteID*, TypeOfLocation)

PACKAGE(*CruiseID*, *TourID*, *CruiseID*, *TourID*)

SCHEDULE(*CruiseID*, *BookingStartDate*, *StaffID*, StaffStartDate, StaffEndDate)

### Step 6: Multi-valued Attributes

SERVICECOMMENT(*VesselID*, *ServiceDocID*, Comment)

### Step 7: Associative entities

There are no associative entities

### Step 8a

SMALLVESSEL(VesselID)

MEDIUMVESSEL(VesselID)

LONGVESSEL(VesselID)

SHOTRCRUISE(CruiseID)

LONGCRUISE(CruiseID)

CREWSTAFF(StaffID, CrewStaffQualifications)

TOURSTAFF(StaffID, TourStaffTourPreferences)

TOURSTAFFDRIVER(StaffID, TourStaffDriverLicenseNumber)

TOURSTAFFGUIDE(StaffID, TourStaffGuideCertificationNumber)

### Step 2: Week Entities

There are no week entities

### Step 3: 1:1 relationship

There are no 1:1 relationships

### Step 4: 1:N relationship

SHOTRCRUISE(CruiseID, *VesselID*)

LONGCRUISE(CruiseID, *VesselID*)

TOURSTAFF(StaffID, TourStaffTourPreferences, *LocationID*)

#### Step 5: M:N relationship

There are no M:N relationships

#### Step 6: Multi-valued Attributes

There are no multi-valued attributes

#### Step 7: Associative entities

There are no associative entities

#### Final Answer

VESSEL(VesselID, VesselName, VesselPurchaseYear, *ModelID*)

SMALLVESSEL(VesselID)

MEDIUMVESSEL(VesselID)

LONGVESSEL(VesselID)

MODEL(ModelID, ModelName, ModelPassengerCapacity)

SERVICEDOC(ServiceDocID, ServiceDocName)

SERVICE(*VesselID*, *ServiceDocID*, ServiceDate)

SERVICECOMMENT(*VesselID*, *ServiceDocID*, Comment)

CRUISE(CruiseID, CruiseName, CruiseNumberOfDays, VesselMonthsBooked)

SHOTRCRUISE(CruiseID, *VesselID*)

LONGCRUISE(CruiseID, *VesselID*)

ROUTE(*CruiseID*, RouteID, RouteDescription)

TOUR(*CruiseID*, TourID, TourName, TourCost, TourType, *LocationID*)

BOOKING(*CruiseID*, BookingStartDate, BookingMaxCapacity)

LOCATION(LocationID, LocationName)

ROUTELOCATIONS(*LocationID*, *CruiseID*, *RouteID*, TypeOfLocation)

PACKAGE(*CruiseID*, *TourID*, *CruiseID*, *TourID*)

STAFF(StaffID, StaffName, StaffPosition, StaffSalary)

CREWSTAFF(StaffID, CrewStaffQualifications)

TOURSTAFF(StaffID, TourStaffTourPreferences, *LocationID*)

TOURSTAFFDRIVER(StaffID, TourStaffDriverLicenseNumber)

TOURSTAFFGUIDE(StaffID, TourStaffGuideCertificationNumber)

SCHEDULE(*CruiseID*, *BookingStartDate*, *StaffID*, StaffStartDate, StaffEndDate)