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LOGICAL DATABASE REPRESENTATION

Table	Reasoning behind the derivation
Vehicle (regNum, FleetNum, Colour, Make, Model, DepotID) **Primary Key** regNum **Foreign Key** Make **references** Vehicle Type (Make) ON UPDATE CASCADE **Foreign Key** Model **references** Vehicle Type (Model) ON UPDATE CASCADE **Foreign Key** DepotID **references** Depot (DepotID) ON DELETE SET NULL	Vehicle is a strong entity. The table contains simple attribute like FleeetNum, Color. Make and Model have been posted as FK into Vehicle relation from a 1:* relationship with Vehicle Type. Vehicle is the child entity while Vehicle Type is Parent entity. These FKs is NOT NULL as a vehicle must have a defined make and model. DepotID has been posted as FK from a 1:* relationship with Depot table, where Depot is parent entity, Vehicle is Child. It can be NULL because a vehicle could not be currently assigned to a depot. ON UPDATE CASCADE for Make and Model ensures that changes to vehicle type details automatically propagate to the Vehicle ON DELETE SET NULL for DepotID allows vehicle to remain in system even if its associated depot is deleted (unassigned vehicle)
VehicleType (Make, Model, Doors, Body, Trim, Fuel) **Primary Key** Make, Model	Vehicle Type is a strong entity. Contains simple attribute like Doors, Body, Trim, Fuel. No FK are posted. FK constraints are not applicable since no presence of FKs
DailyTariff (tariffID, Conditions) **Primary Key** tariffID	Daily tariff is a strong entity. TariffID and Conditions are simple attributes. There are no composite attributes. No FKs are posted into this table. FK Constraints: not applicable as this table has no foreign keys.
Rent (tariffID, Make, Model, rentalPrice) **Primary Key** tariffID, Make, Model **Foreign Key** tariffID **references** Daily Tariff (tariffID) ON UPDATE CASCADE ON DELETE CASCADE **Foreign Key** Make **references** Vehicle Type (Make) ON UPDATE CASCADE ON DELETE CASCADE **Foreign Key** Model **references** Vehicle Type (Model) ON UPDATE CASCADE ON DELETE CASCADE	Weak entity, was created to represent the relationship between Daily Tariff and Vehicle Type table. TariffID is posted as FK from a *:* relationship, Make and Model are posted as FK too. TariffID, Make, Model are PKs because I post a copy of the primary key attribute(s) of the entities that participate in the relationship into the new relation (Rent) to act as FKs. These FKs is NOT NULL because every rent record must be associated with a tariff and a vehicle type. ON UPDATE CASCADE was chosen to update the FKs whenever the attribute changes in those tables. ON DELETE CASCADE ensures that removing a tariff/vehicle type also removes related rental records to avoid orphaned data.

HiredVehicle (Date, cardType, cardNo, Odometer, Days, DepotID, regNum, Address, street, postcode, tariffID, InsuranceID) **Primary Key** Date **Foreign Key** DepotID **references** Depot(DepotID) ON UPDATE CASCADE ON DELETE NO ACTION **Foreign Key** regNum **references** Vehicle(regNum) ON UPDATE CASCADE ON DELETE NO ACTION **Foreign Key** Address, street, postcode **references** Client(Address, street, postcode) ON UPDATE CASCADE ON DELETE NO ACTION **Foreign Key** tariffID **references** Daily Tariff (TariffID) ON UPDATE CASCADE ON DELETE NO ACTION **Foreign Key** insuranceID **references** Insurance(insuranceID) ON UPDATE CASCADE ON DELETE NO ACTION	Strong entity, has simple attributes such as CardType, cardNo, Odometer, Days. DepotID has been posted as FK from 1:* relationship, where Depot is parent, HiredVehicle is child. This FK is NOT NULL becuz a hired vehicle must be related with a depot. regNum is FK from 1:* with Vehicle, where Vehicle is Parent too. It is NOT NULL. Address, street, postcode is FK from 1:* with Client, where Client is Parent. It is NOT NULL. TariffID is FK from 1:* with Daily Tariff, where the 2nd is Parent. It is NOT NULL. InsuranceID is FK from 1:* with Insurance, where the 2nd is Parent. It can be NULL since Insurance has a 0..1 constraint (a hired vehicle can be insured 0 or 1 Insurance). ON UPDATE CASCADE ensures updates to reflected entities are reflected in hire records. ON DELETE NO ACTION prevents the deletion of associated records without first managing the hire record, maintain data consistency
Invoice (InvoiceID, qualityCheck) **Primary Key** InvoiceID.,. **Foreign Key** Date **references** HiredVehicle (Date) ON UPDATE CASCADE ON DELETE CASCADE	Weak entity, dependent on HiredVehicle entity. Date is FK from a 1:* with HiredVehicle, where the 2nd is parent. It is NOT NULL as invoice must be associated with a hire. ON UPDATE CASCADE ensures if the hire date changes, invoice is automatically updated ON DELETE CASCADE ensures if the hire is deleted, the related invoice is removed (avoid orphan data) Derived attributes (datePaid) are values that can be **calculated or derived** from other data, so they don't need to be physically stored in the table.
Booking (startDate, hireDays, colour, DepotID, Address, street, postcode, Make, Model) **Primary Key** startDate **Foreign Key** DepotID **references** Depot (DepotID) ON UPDATE CASCADE ON DELETE NO ACTION **Foreign Key** Address, street, postcode **references** Client (Address, street, postcode) ON UPDATE CASCADE ON DELETE NO ACTION **Foreign Key** Make **references** Vehicle Type (Make) ON UPDATE CASCADE ON DELETE NO ACTION	Strong entity. DepotID is FK from a 1:* with Depot, 2nd is parent. It is NOT NULL. Address, street, postcode is similar, NOT NULL. Make and Model are FKs, NOT NULL. ON UPDATE CASCADE ensures updates to related entities are reflected in bookings. ON DELETE NO ACTION prevents the deletion of related records without first updating the booking record.

Foreign Key Model **references** Vehicle Type (Model) ON UPDATE CASCADE ON DELETE NO ACTION	
Depot (DepotID, street, postcode, phone, email) **Primary Key** DepotID	Strong entity, simple attributes like street, postcode are part of the composite attribute (Address). No FK appeared since Depot is Parent entity to all connected entities.
PersonalClient (address, street, postcode, phone, fName, lName, title, driversNum) **Primary Key** address, street, postcode	Strong entity?, PK are simple attributes like address, street, postcode which are part of composite attribute (Address, street, postcode), and fName, Lname, title are part of composite (name). Follows a MANDATORY DISJOINT constraint with Client entity so we merge all simple attributes from Client to this entity. The PK is Address, street, postcode, inherited from Client. FK = none Combined Superclass with Subclass
CompanyClient (address, street, postcode, phone, cName) **Primary Key** address, street, postcode **Foreign Key** address, street, postcode **references** PersonalClient (address, street, postcode) ON DELETE CASCADE	Weak entity? Due to dependency on PersonalClient. It follows MANDATORY DISJOINT with Client so we also merge all simple attributes into 1 entity. PK = address, street, postcode. However, since it has a 1:1 relationship with PersonalClient, with 2nd being Parent, the FK address, street, postcode are posted into CompanyClient. FK is NOT NULL as every company client must have 1 representative. ON DELETE CASCADE ensures that if a personal client is deleted, the corresponding company client record is also removed (maintain referential integrity, avoid orphan data)
Nomination (Address, street, postcode, Date) **Primary Key** Address, street, postcode, Date **Foreign Key** Address, street, postcode **references** PersonalClient (Address, street, postcode) ON DELETE CASCADE **Foreign Key** Date **references** HiredVehicle (Date) ON DELETE CASCADE	Is created to represent the relationship between PersonalClient and HiredVehicle. Weak entity Address, street, postcode and Date are posted as FK and both of them will also form the PK. PersonalClient and HiredVehicle are parent, Nomination is Child. 2 FKs is NOT NULL as every nomination must be associated with a personal client and specific hired vehicle. ON DELETE CASCADE: ensure if the associated personal client/hired vehicle is deleted, the related nomination is also deleted
Insurance (insuranceID, policyType, cost, policyNumber) **Primary Key** insuranceID	Strong entity, no FK appeared so no constraints.