

# COMP8711 Assignment 2 (Zhiyun Chen)

## Part 1

**Client** (clientNo, fName, lName, address, contactPhone, driverLicense)

**Primary Key:** clientNo

**Reason:** Client is a strong entity. The composite attribute name has been divided into its constituent attributes fName and lName. staffNo has been merged into the Client entity from a 1:\* Registers relationship where Client was the child and Staff was the parent. staffNo is NOT NULL as Client has mandatory participation in the Registers relationship. No foreign keys are needed in this relation.

**Ute** (fleetMembershipNo, regNo, color, make)

**Primary Key:** fleetMembershipNo

**Reason:** Ute is a strong entity. All its attributes are included in the relation. No foreign keys are required in this relation.

**Contract** (contractID, dateTime, cardType, cardNo, startKilometer, endKilometer, paymentDate, paymentAmount, clientNo, fleetMembershipNo)

**Primary Key:** contractID

**Foreign Key:** clientNo references Client(clientNo) ON UPDATE CASCADE ON DELETE NO ACTION

**Foreign Key:** fleetMembershipNo references Ute(fleetMembershipNo) ON UPDATE CASCADE ON DELETE SET NULL

**Reason:** Contract is a strong entity. The attributes clientNo and fleetMembershipNo are foreign keys to maintain referential integrity. clientNo references the Client entity, ensuring that each contract is associated with a valid client. ON UPDATE CASCADE is used to update the references when a client's clientNo changes. ON DELETE NO ACTION prevents the deletion of a client without first addressing the associated contracts. fleetMembershipNo references the Ute entity, but it's allowed to be set to NULL if the Ute is deleted.

**Booking** (bookingID, pickupDepot, startDateTime, hireDays, preferredColor, clientNo)

**Primary Key:** bookingID

**Foreign Key:** clientNo references Client(clientNo) ON UPDATE CASCADE ON DELETE NO ACTION

**Reason:** Booking is a strong entity. The attribute clientNo is a foreign key to maintain referential integrity with the Client entity, ensuring that each booking is associated with a valid client. ON UPDATE CASCADE is used to update the reference when a client's clientNo changes. ON DELETE NO ACTION prevents the deletion of a client without first addressing the associated bookings.

## Part 2

### Functional Dependencies

FD1 - depotID → address, phone (A specific depotID determines the address and phone number)

FD2 - regNum → depotID, typeID, fleetNum, colour (The regNum uniquely identifies each vehicle and its associated details)

FD3 - typeID → make, model, doors, body, trim (The typeID determines the vehicle type and specifications)

### 1NF:

depotID	address	phone	regNum	typeID	fleetNum	colour	make	model	doors	body	trim
20	ISTFlinders5000	1400111111	ABC001	AQ51	100	Blue	Audi	Q5	4	SUV	Standard
20	ISTFlinders5000	1300111111	ABC001	AQ51	100	Blue	Audi	Q5	4	SUV	Standard
30	TonsleyFlinders5500	555111444	DEF003	AQ51	100	Red	Audi	Q3	4	Small SUV	Sports
30	TonsleyFlinders5500	3100200505	DEF003	AQ51	100	Red	Audi	Q3	4	Small SUV	Sports
20	ISTFlinders5000	1400111111	XYZ200	MCX2	200	Gold	Mazda	CX30	4	SUV	Luxury
20	ISTFlinders5000	1300111111	XYZ200	MCX2	200	Gold	Mazda	CX30	4	SUV	Luxury
30	TonsleyFlinders5500	555111444	WXY350	HAC3	300	Silver	Honda	Accord	4	Sedan	Standard
30	TonsleyFlinders5500	3100200505	WXY350	HAC3	300	Silver	Honda	Accord	4	Sedan	Standard

Duplicate phone number

### 2NF:

#### Depot

depotID, address, phone

#### Vehicle

regnum, depotID, typeID, fleetNum, colour, make, model, doors, body, trim

### 3NF

### Depot

depotID, address, phone

depotID	address	phone
20	IST Flinders 5000	1400111111
30	Tonsley Flinders 5500	55111444

### Vehicle Type

typeID, make, model, doors, body, trim

typeID	make	model	doors	body	trim
AQ51	Audi	Q5	4	SUV	Standard
DEF003	Audi	Q3	4	Small SUV	Sports
MCX2	Mazda	CX30	4	SUV	Luxury
HAC3	Honda	Accord	4	Sedan	Standard

### Fleet

FleetNum, typeID

fleetNum	typeID
100	AQ51
200	MCX2
300	HAC3

### Vehicle

regnum, depotID, fleetNum, colour

regNum	depotID	fleetNum	colour
ABC001	20	100	Blue
DEF003	30	100	Red
XYZ200	20	200	Gold
WXY350	30	300	Silver