

CSC623 Project 1

Part 1 - Conceptual Model

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Part A - Entities

Entity	Description
Employee	Describes employee details
Client	Describes client details
Equipment	Describes the equipment owned by the company, its description, its usage, and the cost to use it
Requirement	Describes the client's requirements for a job. Includes the times needed and equipment needed for each day of the week the client requires cleaning
Reservation	Describes the specific requirement of the client that is being fulfilled. Includes the employee assigned to complete the cleaning and the specific equipment needed. Every time a requirement is fulfilled, a new row is added to this entity (each Monday will have a different row - allows for schedule changes to vary between weeks)

Part B & C - Relationship Types & Multiplicities

Entity 1	Mult. 1 p...c	Relationship	Mult. 2 p...c	Entity 2	Type of Relationship
Client	1..1	Has →	1..*	Requirement	1...*
Client	1..1	Booked →	1..*	Reservation	1...*
Employee	1..*	Scheduled for →	1..*	Reservation	*...*
Equipment	1..*	Assigned to →	1..*	Reservation	*...*
Requirement	1..1	Fulfilled by →	1..*	Reservation	1...*

Explanations:

- A client can have multiple requirements (i.e. Mondays from 5-7pm and Thursdays from 3-4pm would be in different rows, but same clientNo), but a requirement can only be associated with one client - 1...*
- A client can have multiple reservations (fulfill multiple requirements), but a reservation can only have one client because it is describing one job - 1...*

- An employee can be scheduled for multiple reservations because they can do more than one job. A reservation can have more than one employee because some jobs might require multiple - *...*
- Similar to employees, equipment can be used for multiple different jobs (as long as they aren't at the same time). Additionally, a reservation might require multiple types of equipment - *...*
- A reservation can only be fulfilling one Client's requirements. However, a requirement can be associated with multiple reservations. For example, if a client's requirement is every Monday from 5-6pm, then there will be a new row in the reservation entity for each Monday that occurs. This is important because the employees assigned to a job each week might vary - 1...*

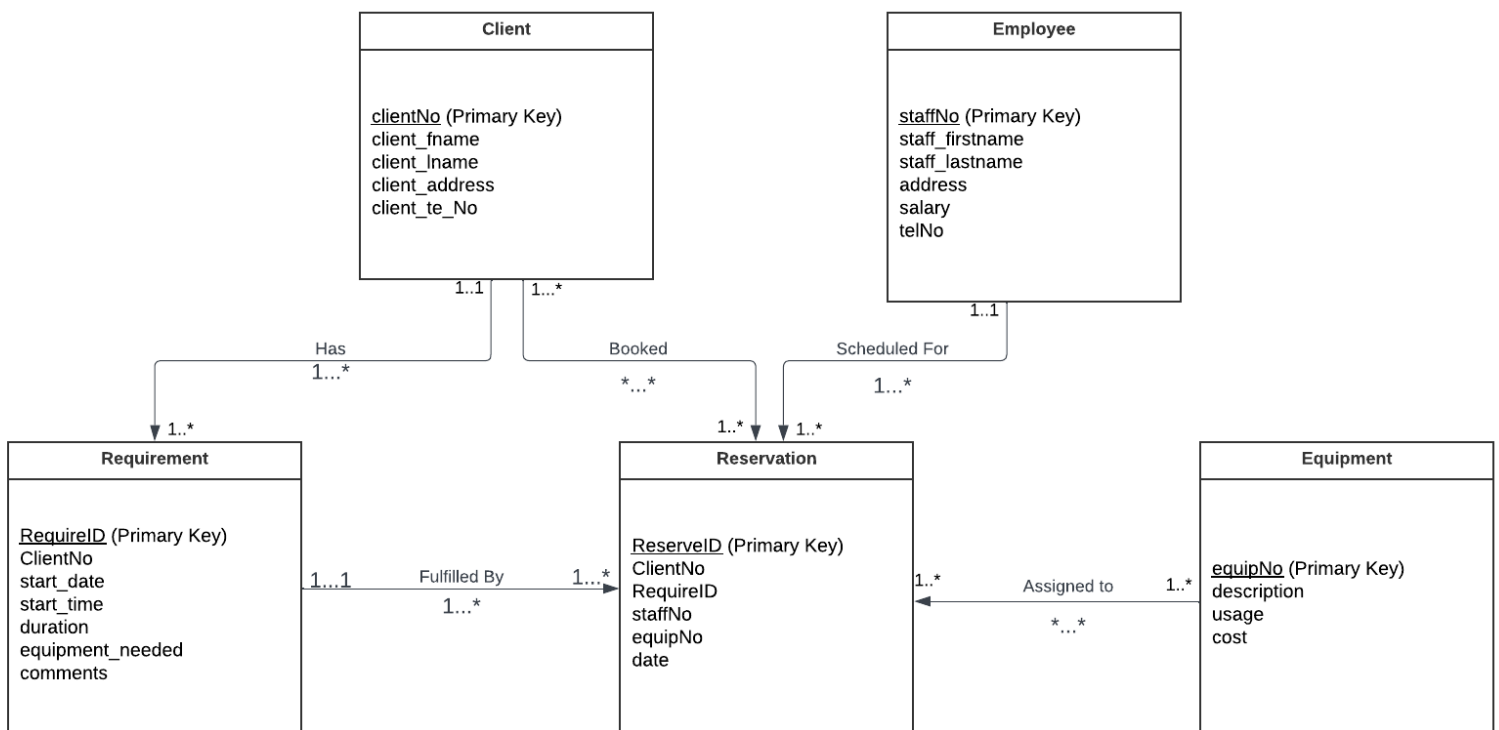
Part D - Attributes

Entity	Attributes
Employee	staffNo, staff_firstname, staff_lastname, address, salary, telNo
Client	clientNo, client_fname, client_lname, client_address, client_te_No
Equipment	equipNo, description, usage, cost
Requirement	RequireID, ClientNo, start_date, start_time, duration, equipment_needed, comments
Reservation	ReserveID, ClientNo, RequireID, staffNo, equipNo, date

Part E - Candidate & Primary Keys

Entity	Candidate Key(s)	Primary Key
Employee	staffNo	staffNo
Client	clientNo	clientNo
Equipment	equipNo	equipNo
Requirement	RequireID	RequireID
Reservation	ReserveID, {RequireID, date}	ReserveID

Part F - ER Model



Extra Notes:

Constraints for Database:

- 1) EquipNo in reservation - selected from equipment list where equipment.description = requirement.equipment_needed
- 2) EquipNo in Reservation can only be assigned to one reserveID at one time (Can't be double booked for same piece of equipment)
- 3) StaffNo in Reservation can only be assigned to one reserveID at one time (employee can't be double booked for same time - only work one cleaning job at once)
- 4) All primary keys must be unique within its entity
- 5) RequireID in Reservation must also be unique because we don't want to schedule two cleanings for the same job
- 6) Requirement contains the specific day of the week and when it starts. Reservation date must meet these requirements stated in the requirement entity joined on the requireID.

