

CSC 623 Project Part 1  
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a)

Main entity types:

Strong entity types: Requirement, Client, Equipment, Employee

b)

Relationship types:

Entity 1	Relationship	Entity 2
Requirement	IsProposedBy	Client
Client	Proposes	Requirement
Equipment	Supports	Requirement
Requirement	Needs	Equipment
Employee	IsAssignedTo	Requirement
Requirement	IsCompletedBy	Employee

c)

Multiplicity constraints:

Entity 1	Relationship	Entity 2	Multiplicity
Requirement	IsProposedBy	Client	1..1
Client	Proposes	Requirement	1..*
Equipment	Supports	Requirement	0..*
Requirement	Needs	Equipment	0..*
Employee	IsAssignedTo	Requirement	1..*
Requirement	IsCompletedBy	Employee	1..*

In the description of the project, it says “Whenever a new client is taken on, it is determined whether any special equipment is required and when”, so I believe that it implies two situations:

1. Special equipment is required for the new client.
2. No special equipment is required for the new client.

So, a requirement may not need any equipment.

d)

Attributes and association:

Client (**clientNo**, fName, lName, address, tel)

Employee (**staffNo**, fName, lName, address, salary, tel)

Requirement (**reqID**, startDate, startTime, duration, comment)

Equipment (**equipID**, description, usage, cost)

Client and Requirement:

A client can make multiple requests, and a requirement can only be proposed by one client, so it's a one-to-many relationship from Client to Requirement.

Employee and Requirement:

A requirement may be completed by several employees. An employee can handle multiple requirements. Thus, it's a many-to-many relationship from Employee to Requirement.

Equipment and Requirement:

A requirement may need multiple equipment, and a piece of equipment could be used for several requirements. It's a many-to-many relationship.

e)

Candidate and primary key:

Client:

Candidate key: client number

Primary key: client number

Employee:

Candidate key: staff number

Primary key: staff number

Requirement:

Candidate key: requirement ID

Primary key: requirement ID

Equipment:

Candidate key: equipment ID

Primary key: equipment ID

f)

E-R diagram:

