2.1 Regular Entity

|  |  |
| --- | --- |
| Relation | Mapping Method |
| (All of the entities) | Create separate tables for each entity. Use the first approach. (create separate table for subclass entities.) |

1. Employee:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| EmployeeID | Age | Salary\_rate | Name | State | City | Street\_name | Street\_number | Zipcode |

1. Dinning:

|  |  |  |
| --- | --- | --- |
| EmployeeID | Shift | Type |

EmployeeID is a FK referencing to the Employee.EmployeeID.

1. Concierge:

|  |  |
| --- | --- |
| EmployeeID | Concierge\_experience\_year |

EmployeeID is a FK referencing to the Employee.EmployeeID.

1. Housekeeping:

|  |  |
| --- | --- |
| EmployeeID | Housekeeping\_experience\_year |

EmployeeID is a FK referencing to the Employee.EmployeeID.

1. Receptionist:

|  |  |
| --- | --- |
| EmployeeID | Language |

EmployeeID is a FK referencing to the Employee.EmployeeID.

1. Tech\_support:

|  |  |
| --- | --- |
| EmployeeID | Tech\_support\_licence |

EmployeeID is a FK referencing to the Employee.EmployeeID.

1. Management:

|  |  |
| --- | --- |
| EmployeeID | Title |

EmployeeID is a FK referencing to the Employee.EmployeeID.

1. Catering:

|  |
| --- |
| EmployeeID |

EmployeeID is a FK referencing to the Employee.EmployeeID.

1. Accountant:

|  |  |
| --- | --- |
| EmployeeID | Accountant\_licence |

EmployeeID is a FK referencing to the Employee.EmployeeID.

1. Event:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Event\_ID | Event\_date | Event\_time | Event\_manager\_ID | Event\_deposit |

Event\_manager\_ID is a FK referencing to the Management.EmployeeID.

1. Client:

|  |
| --- |
| Customer\_ID |

1. Organization:

|  |
| --- |
| Customer\_ID |

Customer\_ID is a FK referencing to the Client. Customer\_ID.

1. Individual:

|  |  |  |  |
| --- | --- | --- | --- |
| Customer\_ID | Birthdate | Individual\_name | Individual\_sex |

Customer\_ID is a FK referencing to the Client. Customer\_ID.

1. Membership:

|  |
| --- |
| Membership\_number |

1. Room:

|  |  |  |  |
| --- | --- | --- | --- |
| Room\_number | Bed\_type | Room\_type | Per\_night\_price |

2.2: Weak Entity (We do not have this☹)

2.3: Mapping 1:1 relationship

|  |  |
| --- | --- |
| Relation | Mapping Method |
| C:\Users\wzwfa\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Evant_servant.png | We use Foreign key approach to map this relationship. Since on one side, the self-recursive is total participation, we include the Event\_staff\_ID as a foreign key in the Employee table, which referencing the primary key of Employee.EmployeeID. |

Employee:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| EmployeeID | Age | Salary\_rate | Name | State | City | Street\_name | Street\_number | Zipcode | Event\_staff\_ID |

Event\_staff\_ID is a FK referencing to the Employee. EmployeeID.

2.4 Mapping 1:N relationship (We do not have this☹)

2.5 Mapping M:N relationship

|  |  |
| --- | --- |
| Relation | Mapping Method |
| C:\Users\wzwfa\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Clear.png | Since it is a M:N relationship, we create a new table and add the two entities’ primary key as foreign keys. Employee\_ID is a FK referencing to the Housekeeping.EmployeeID. Room\_number is a FK referencing to the Room. Room\_number. |
| C:\Users\wzwfa\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Cheack_out_bill.png | Since it is a M:N relationship, we create a new table and add the two entities’ primary key as foreign keys. Room\_number is a FK referencing to the Room. Room\_number. Customer\_ID is a FK referencing to the Individual. Customer\_ID. |
| C:\Users\wzwfa\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Has.png | Since it is a M:N relationship, we create a new table and add the two entities’ primary key as foreign keys. Customer\_ID is a FK referencing to the Individual. Customer\_ID. Membership\_number is a FK referencing to the Membership. Membership\_number. |
| C:\Users\wzwfa\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Holds.png | Since it is a M:N relationship, we create a new table and add the two entities’ primary key as foreign keys. Event\_ID is a FK referencing to the Event.Event\_ID. Customer\_ID is a FK referencing to the Organization.Customer\_ID. |
| C:\Users\wzwfa\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Serve.png | Since it is a M:N relationship, we create a new table and add the two entities’ primary key as foreign keys. Event\_ID is a FK referencing to the Event.Event\_ID. Employee\_ID is a FK referencing to the Employee.Employee\_ID. |

1. Clear:

|  |  |  |  |
| --- | --- | --- | --- |
| Employee\_ID | Room\_number | cDate | cTime |

Employee\_ID is a FK referencing to the Housekeeping.EmployeeID.

Room\_number is a FK referencing to the Room. Room\_number.

1. Check\_out\_bill:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Room\_number | Customer\_ID | Check\_out\_bill\_amount | Check\_out\_bill\_issued\_date | Check\_in\_date | Check\_out\_date |

Room\_number is a FK referencing to the Room. Room\_number.

Customer\_ID is a FK referencing to the Individual. Customer\_ID.

1. Has:

|  |  |
| --- | --- |
| Customer\_ID | Membership\_number |

Customer\_ID is a FK referencing to the Individual. Customer\_ID.

Membership\_number is a FK referencing to the Membership. Membership\_number.

1. Holds:

|  |  |
| --- | --- |
| Event\_ID | Customer\_ID |

Event\_ID is a FK referencing to the Event.Event\_ID.

Customer\_ID is a FK referencing to the Organization.Customer\_ID.

1. Serve:

|  |  |  |  |
| --- | --- | --- | --- |
| Event\_ID | Employee\_ID | Oncall\_speaker | Oncall\_number |

Event\_ID is a FK referencing to the Event.Event\_ID.

Employee\_ID is a FK referencing to the Employee.Employee\_ID.

2.6: Mapping of Multivalued Attributes

|  |  |
| --- | --- |
| Relation | Mapping Method |
|  | Bill\_event\_payment is a multivalued attribute. It is mapped as a new table. CustomerID is a foreign key referencing to the Organization.Customer\_ID. Customer\_ID and Event\_bill\_ID are the primary key. |
|  | Direct\_bill\_account is a multivalued attribute. It is mapped as a new table. Customer\_ID is a FK from Organization.Customer\_ID. Customer\_ID and Direct\_bill\_account are the primary key. |
|  | Phone is a multivalued attribute. It is mapped as a new table. Customer\_ID is a FK from Individual.Customer\_ID. Customer\_ID and Phone are the primary key. |
|  | Check\_out\_payment\_ID is a multivalued attribute. It is mapped as a new table. Customer\_ID is a FK referencing to the Individual.Customer\_ID. Room\_number is a FK referencing to the Room.Room\_number. Customer\_ID, Room\_number, COP\_time and COP\_date are the primary key. |

1. Bill\_event\_payment:

(Implemented after 2.7)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Customer\_ID | Event\_bill\_ID | pDate | pTime | Amount\_of\_event\_payment | Date\_of\_payment |

Customer\_ID is a FK referencing to the Organization.Customer\_ID.

1. Direct\_bill\_account:

|  |  |
| --- | --- |
| Customer\_ID | Direct\_bill\_account |

Customer\_ID is a FK referencing to the Organization.Customer\_ID.

1. Phone:

|  |  |
| --- | --- |
| Customer\_ID | Phone |

Customer\_ID is a FK referencing to the Individual.Customer\_ID.

1. Check\_out\_payment\_ID:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Customer\_ID | Room\_number | COP\_time | COP\_date | COP\_amount\_of\_payment |

Customer\_ID is a FK referencing to the Individual.Customer\_ID.

Room\_number is a FK referencing to the Room.Room\_number.

2.7: Mapping n-ary relationship

|  |  |
| --- | --- |
| Relation | Mapping Method |
| C:\Users\wzwfa\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Check_in.png | Check\_in is a ternary relationship. Customer\_ID is a FK referencing to the Client.Customer\_ID. Employee\_ID is a FK referencing to the Receptionist.Employee\_ID. Room\_number is a FK referencing to the Room.Room\_number. Customer\_ID, Employee\_ID, Room\_number, Check\_in\_date, and Check\_in\_time are the primary key. |
| C:\Users\wzwfa\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Bill_for_event.png | Bill\_for\_event is a ternary relationship. Customer\_ID is a FK referencing to the Organization.Customer\_ID. Event\_ID is a FK referencing to the Event.Event\_ID. Employee\_ID is a FK referencing to the Accountant.Employee\_ID. Customer\_ID and Event\_bill\_ID are the primary key. |

1. Check\_in:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Customer\_ID | Employee\_ID | Room\_number | Check\_in\_date | Key\_type | Check\_in\_time | Lounge | Length\_of\_stay |

Customer\_ID is a FK referencing to the Client.Customer\_ID.

Employee\_ID is a FK referencing to the Receptionist.Employee\_ID.

Room\_number is a FK referencing to the Room.Room\_number.

1. Bill\_for\_event:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Customer\_ID | Event\_bill\_ID | Event\_ID | Employee\_ID | Bill\_event\_date\_issued | Bill\_event\_amount |

Customer\_ID is a FK referencing to the Organization.Customer\_ID.

Event\_ID is a FK referencing to the Event.Event\_ID.

Employee\_ID is a FK referencing to the Accountant.Employee\_ID.

2.8: Final relational schema

Employee:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| EmployeeID | Age | Salary\_rate | Name | State | City | Street\_name | Street\_number | Zipcode | Event\_staff\_ID |

Dinning:

|  |  |  |
| --- | --- | --- |
| EmployeeID | Shift | Type |

EmployeeID is a FK referencing to the Employee.EmployeeID.

Concierge:

|  |  |
| --- | --- |
| EmployeeID | Concierge\_experience\_year |

EmployeeID is a FK referencing to the Employee.EmployeeID.

Housekeeping:

|  |  |
| --- | --- |
| EmployeeID | Housekeeping\_experience\_year |

EmployeeID is a FK referencing to the Employee.EmployeeID.

Receptionist:

|  |  |
| --- | --- |
| EmployeeID | Language |

EmployeeID is a FK referencing to the Employee.EmployeeID.

Tech\_support:

|  |  |
| --- | --- |
| EmployeeID | Tech\_support\_licence |

EmployeeID is a FK referencing to the Employee.EmployeeID.

Management:

|  |  |
| --- | --- |
| EmployeeID | Title |

EmployeeID is a FK referencing to the Employee.EmployeeID.

Catering:

|  |
| --- |
| EmployeeID |

EmployeeID is a FK referencing to the Employee.EmployeeID.

Accountant:

|  |  |
| --- | --- |
| EmployeeID | Accountant\_licence |

EmployeeID is a FK referencing to the Employee.EmployeeID.

Event:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Event\_ID | Event\_date | Event\_time | Event\_manager\_ID | Event\_deposit |

Event\_manager\_ID is a FK referencing to the Management.EmployeeID.

Client:

|  |
| --- |
| Customer\_ID |

Organization:

|  |
| --- |
| Customer\_ID |

Customer\_ID is a FK referencing to the Client. Customer\_ID.

Individual:

|  |  |  |  |
| --- | --- | --- | --- |
| Customer\_ID | Birthdate | Individual\_name | Individual\_sex |

Customer\_ID is a FK referencing to the Client. Customer\_ID.

Membership:

|  |
| --- |
| Membership\_number |

Room:

|  |  |  |  |
| --- | --- | --- | --- |
| Room\_number | Bed\_type | Room\_type | Per\_night\_price |

Clear:

|  |  |  |  |
| --- | --- | --- | --- |
| Employee\_ID | Room\_number | Date | Time |

Employee\_ID is a FK referencing to the Housekeeping.EmployeeID.

Room\_number is a FK referencing to the Room. Room\_number

Check\_out\_bill:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Room\_number | Customer\_ID | Check\_out\_bill\_amount | Check\_out\_bill\_issued\_date | Check\_in\_date | Check\_out\_date |

Room\_number is a FK referencing to the Room. Room\_number.

Customer\_ID is a FK referencing to the Individual. Customer\_ID.

Has:

|  |  |
| --- | --- |
| Customer\_ID | Membership\_number |

Customer\_ID is a FK referencing to the Individual. Customer\_ID.

Membership\_number is a FK referencing to the Membership. Membership\_number.

Holds:

|  |  |
| --- | --- |
| Event\_ID | Customer\_ID |

Event\_ID is a FK referencing to the Event.Event\_ID.

Customer\_ID is a FK referencing to the Organization.Customer\_ID.

Serve:

|  |  |  |  |
| --- | --- | --- | --- |
| Event\_ID | Employee\_ID | On\_call\_speaker | On-call\_number |

Event\_ID is a FK referencing to the Event.Event\_ID.

Employee\_ID is a FK referencing to the Employee.Employee\_ID.

Bill\_event\_payment:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Customer\_ID | Event\_bill\_ID | Date | Time | Amount\_of\_event\_payment | Date\_of\_payment |

Customer\_ID is a FK referencing to the Organization.Customer\_ID.

Direct\_bill\_account:

|  |  |
| --- | --- |
| Customer\_ID | Direct\_bill\_account |

Customer\_ID is a FK referencing to the Organization.Customer\_ID.

Phone:

|  |  |
| --- | --- |
| Customer\_ID | Phone |

Customer\_ID is a FK referencing to the Individual.Customer\_ID.

Check\_out\_payment\_ID:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Customer\_ID | Room\_number | COP\_time | COP\_date | COP\_amount\_of\_payment |

Customer\_ID is a FK referencing to the Individual.Customer\_ID.

Room\_number is a FK referencing to the Room.Room\_number.

Check\_in:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Customer\_ID | Employee\_ID | Room\_number | Check\_in\_date | Key\_type | Check\_in\_time | Lounge | Length\_of\_stay |

Customer\_ID is a FK referencing to the Client.Customer\_ID.

Employee\_ID is a FK referencing to the Receptionist.Employee\_ID.

Room\_number is a FK referencing to the Room.Room\_number.

Bill\_for\_event:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Customer\_ID | Event\_bill\_ID | Event\_ID | Employee\_ID | Bill\_event\_date\_issued | Bill\_event\_amount |

Customer\_ID is a FK referencing to the Organization.Customer\_ID.

Event\_ID is a FK referencing to the Event.Event\_ID.

Employee\_ID is a FK referencing to the Accountant.Employee\_ID.