**DBS Lab 2**

**DATABASE DESIGN (Modeling)**

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**Tasks:**

The Flight Database stores details about an airline's flights and seat bookings.

Consider the Following requirement List:

* The airline has one or more airplanes.
* An airplane has a model number, a unique registration number, and capacity.
* An airplane flight has a unique flight number, a departure airport, a destination airport, a departure date and time and an arrival date and time.
* Each flight is carried out by a single airplane.
* A passenger has given names, a surname and a unique email address.
* A passenger can book one or more seats on a flight.
* **For the above mentioned case study**
* **1. Identify the Entities.**
* **2. Specify the attributes for each of the entity.**
* **3. Specify the relationship among entities.**
* **Draw the Conceptual Model, , Logical Model and Physical Model.**

**Solution:**

**Entities:**

1. Airline
2. Airplane
3. Airplane flight
4. Passenger
5. Seat

Attributes for all entities:

1. **Airline:**
2. airline\_name
3. no\_of\_airplanes
4. **Airplane:**
   * + - 1. model\_number
         2. registration\_number
         3. capacity
5. **AirFlight:**
   * + - 1. flight\_number
         2. departure\_airport
         3. destination\_airport
         4. departure\_date\_time
         5. arrival\_date\_time
6. **Passenger:**
   * + - 1. p\_name
         2. surname
         3. email address
7. **Seat** 
   * + - 1. flight\_number
         2. seat\_no

**Relationship among Entities**

1. **Airline – Airplane** 🡺 **One – to – Many**
2. **Airplane – AirFlight 🡺 One – to – Many**
3. **Seat – AirFlight 🡺 Many – to – One**
4. **Passenger – Seat 🡺 One – to – Many**

**MODELS**

**Conceptual Model:**

Airplane

N

Airline

1

N

1

AirFlight

Passenger

Seat

N

N

1

1

**Logical Model:**

Airplane

**-model\_number**

**-registration\_number**

**-capacity**

Airline

N

**-airline\_name**

**-no\_of\_airplanes**

1

N

Passenger

Seat

1

N

**-p\_name**

**-surname**

**-email address**

1

1

N

**-flight\_number**

**-seat\_no**

AirFlight

**-flight\_number**

**-departure airport**

**-destination\_airport**

**-departure\_date\_time**

**-arrival\_date\_time**

Airplane

**Physical Model:**

Airline

**-model\_number: VARCHAR(30)**

**-registration number: INTEGER**

**-capacity: INTEGER**

N

1

**-airline\_name: VARCHAR(20)**

**-no\_of\_airplanes: INTEGER**

N

Passenger

**-p\_name: VARCHAR(30)**

**-surname: VARCHAR(20)**

**-email address: VARCHAR(30)**

AirFlight

1

**-flight\_number: INTEGER**

**-departure\_airport: VARCHAR(30)**

**-destination\_airport: VARCHAR(30)**

**-departure\_date\_time: DATETIME**

**-arrival\_date\_time: DATETIME**

N

1

N

Seat

**-flight\_number: INTEGER**

**-seat\_no: INTEGER**

1

**Task 2:**

**Give 2 examples of relational databases with details.**

**Example 1: MySQL:**

**Detail:** It is an open-source relational database management system (RDBMS) that is widely used in web-based applications and is a key component of the LAMP stack which is quite popular stack is backend web development.

**Example 2: ORACLE Database:**

**Detail:** It is a proprietary, enterprise level Relational DBMS known for its robustness, scalability, and comprehensive features. It is widely used in large corporations and enterprises for managing critical business data. It supports complex datatypes as well.

**Task3:**

**Give 1 example of weak and strong entity:**

An Example of weak and strong entity can be a “Student” and “Student-Course”. A student course would be a weak entity as it depends upon the student and can’t exist without it whereas student is a strong entity as it is independent.

Another example can be an “employee” and “employee-salary” where employee salary would be a weak entity and employee would be a strong entity.

**VS**

**Student-Course**

**Student-Course**

**Student**