Airport Management System

PHASE-2

RELATIONAL MODEL

ENTITIES

AIPORT

AP_NAME	CITY	STATE	COUNTRY

AIRLINE

AIRLINEID	AL_NAME	THREE_DIGIT_CODE

FLIGHT

FLIGHT_CODE	SOURCE	DESTINATION	ARRIVAL	DEPARTURE	STATUS	DURATION	FLIGHTTYP	NO_OF_STOPS

PASSENGER

PID	PASSPORTNO	FNAME	M	LNAME	ADDRESS	PHONE	AGE	SEX

TICKET

TICKET_NUMBER	SOURCE	DESTINATION	DATE_OF_TRAVEL	SEATNO	CLASS	PRICE

EMPLOYEE

SSN	FNAME	M	LNAME	ADDRESS	PHONE	AGE	SEX	JOBTYPE	SALARY

1. MAPPING ER DIAGRAM TO RELATIONAL SCHEMA

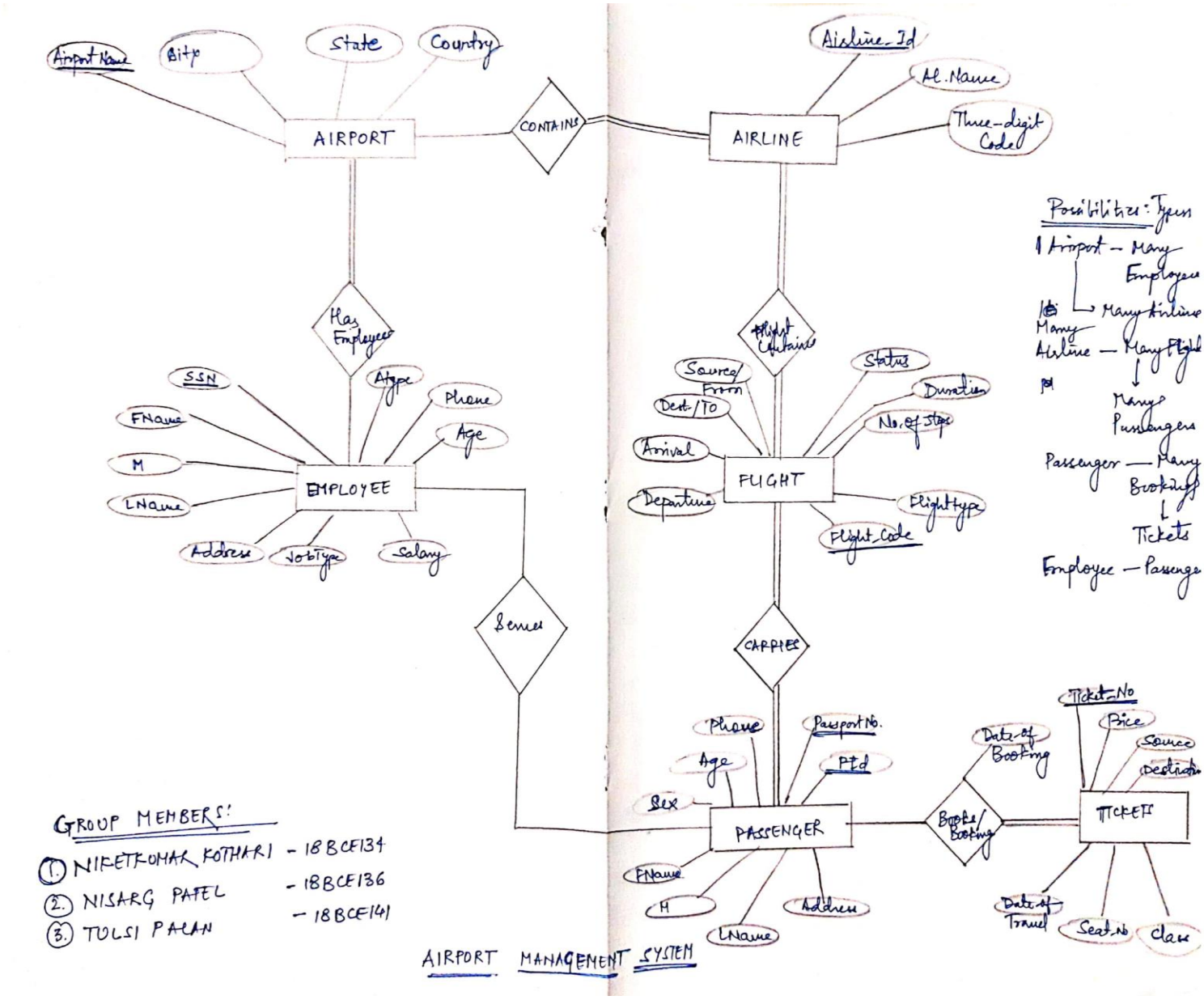


Figure 1: Airport Management System ER Diagram

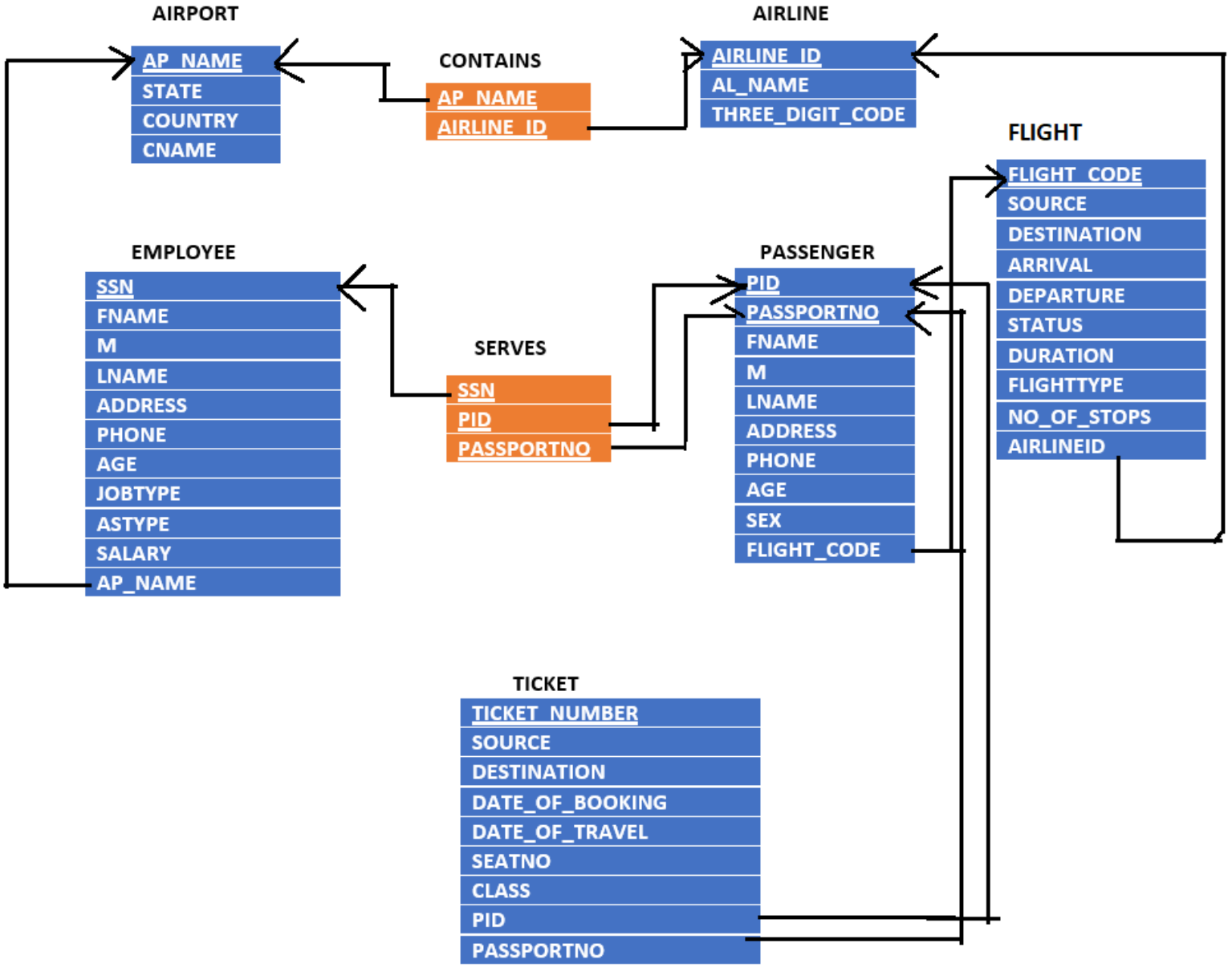
2. ER/EER DIAGRAM

ER diagram contains following relationships

Entity 1	Name of the Relationship	Entity 2	Cardinality
Airport	contains	Airline	m : n
Airport	has	Employee	1 : n
Airline	has	Flight	1 : n
Flight	carries	Passengers	1 : n
Employee	serves	Passengers	m : n
Passenger	books	Ticket	1 : n

Type of the binary relationship	Relationships in the system
one-to-one	(1) A city has only one airport.
one-to-many	(1) An airline has multiple flights, that is many flights belong to the same airline company. (2) A flight carries many passengers. (3) A passenger can book one or more tickets.
many-to-many	All International airlines operating through various countries across the world have their offices located in all major cities and airports they cover. Hence, an airport may have many airline offices.

3. RELATIONAL SCHEMA



4. NORMALIZATION RULES ON DATABASE

FUNCTIONAL DEPENDECIES	
PASSPORTNO -> FNAME, M, LNAME, ADDRESS, PHONE, AGE,SEX	Violates 2NF
PID -> FLIGHT_CODE	Violates 2NF
DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS -> PRICE	Violates 3NF
JOBTYPE -> SALARY	Violates 3NF

Normalizing tables into 3NF

TABLES AFTER NORMALIZATION
AIRPORT (AP_NAME, STATE, COUNTRY, CNAME) AIRLINE (AIRLINEID, AL_NAME, THREE_DIGIT_CODE) CONTAINS (AIRLINEID, AP_NAME) FLIGHT (FLIGHT_CODE, SOURCE, DESTINATION, ARRIVAL, DEPARTURE, STATUS, DURATION, FLIGHTTYPE, NO_OF_STOPS, AIRLINEID) PASSENGER1 (PID, PASSPORTNO) PASSENGER2(PASSPORTNO, FNAME, M, LNAME, ADDRESS, PHONE, AGE, SEX) PASSENGER3 (PID, FLIGHT_CODE) TICKET1 (TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING, DATE_OF_TRAVEL, SEATNO, CLASS, PID, PASSPORTNO) TICKET2 (DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS, PRICE) EMPLOYEE1 (SSN, FNAME, M, LNAME, ADDRESS, PHONE, AGE, JOBTYPE, ASTYPE, AP_NAME) EMPLOYEE2(JOBTYPE, SALARY) SERVES (SSN, PID, PASSPORTNO)

5. NORMALISED RELATIONAL SCHEMA