AIRLINE CASE STUDY

Data Management

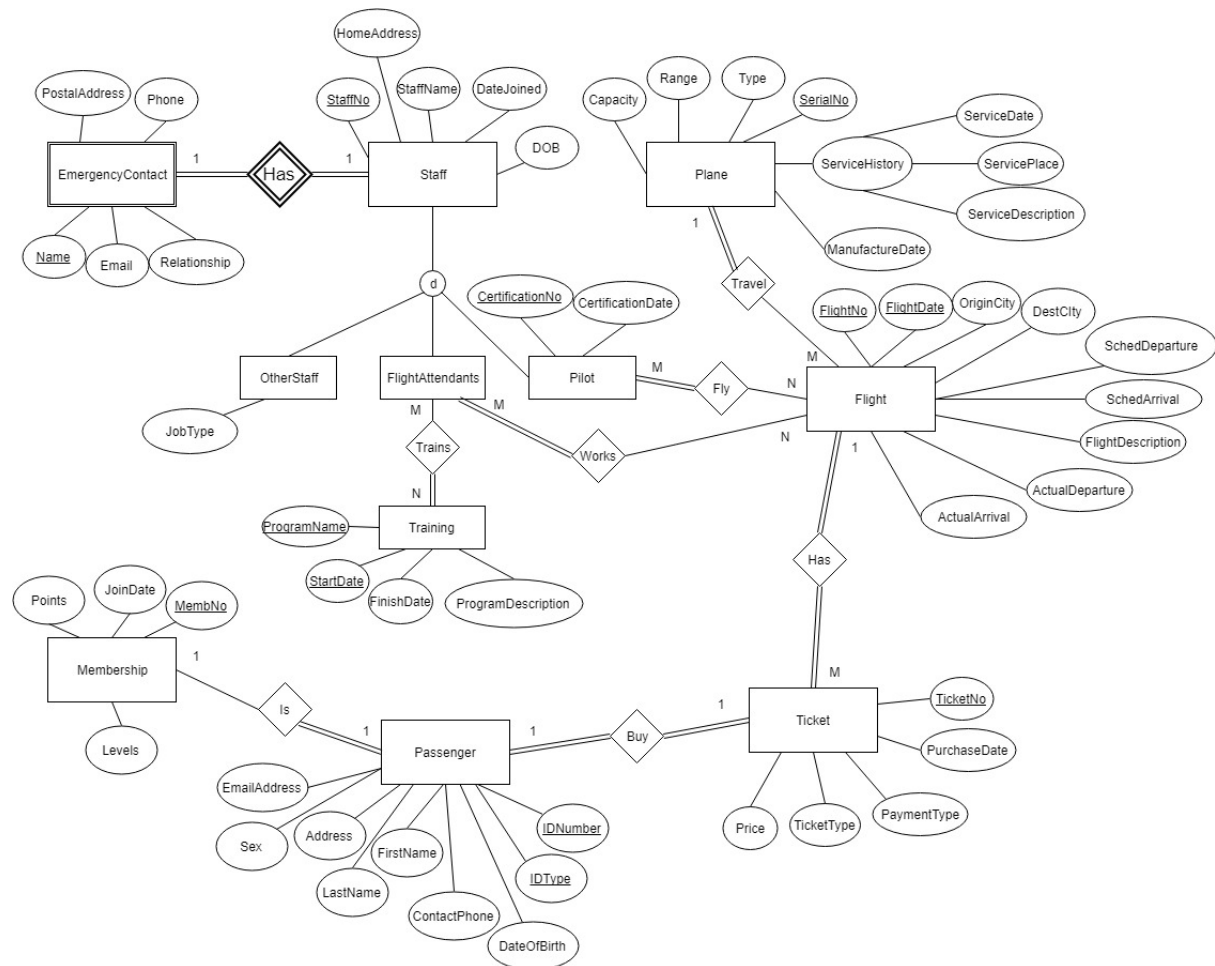| Student Name	Student Number	Contribution	Sign
Luke Kelly	s5057960	50 %	LK
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Task 1:

Assumptions:
- Assuming that the staff members can not have the same emergency contact.
- Assuming a plane can have multiple flights.
- Assuming a staff member and a passenger can only have one email and phone number.
- Assuming staff can either be classified as a pilot, flight attendant or other staff.
- Assuming a training session can be finished in one day.
- Assuming the certification system is organised so that the higher certification number includes all lower certifications.

Task 2:

Staff (<u>StaffNo</u>, HomeAddress, StaffName, DateJoined, DOB)

OtherStaff (<u>StaffNo</u>, HomeAddress, StaffName, DateJoined, DOB, JobType)
FK: StaffNo → Staff(StaffNo)

FlightAttendants (<u>StaffNo</u>, HomeAddress, StaffName, DateJoined, DOB)
FK: StaffNo → Staff(StaffNo)

Pilot (<u>StaffNo</u>, <u>CertificationNo</u>, CertificationDate, HomeAddress, StaffName, DateJoined, DOB)
FK: StaffNo → Staff(StaffNo)

Training (<u>StaffNo</u>, <u>ProgramName</u>, <u>StartDate</u>, FinishDate, ProgramDescription, HomeAddress, StaffName, DateJoined, DOB)
FK: StaffNo → FlightAttendants(StaffNo)

EmergencyContact (<u>StaffNo</u>, <u>Name</u>, Email, Relationship, PostalAddress, Phone)
FK: StaffNo → Staff(StaffNo)

Plane (<u>SerialNo</u>, Capacity, Range, Type, ManufactureDate, ServiceDate, ServicePlace, ServiceDescription)

Trains (<u>StaffNo</u>, <u>ProgramName</u>, <u>StartDate</u>)
FK: StaffNo → FlightAttendants(StaffNo)
FK: ProgramName, StartDate → Training(ProgramName, StartDate)

Flight (<u>FlightNo</u>, <u>FlightDate</u>, OriginCity, DestCity, SchedDeparture, SchedArrival, FlightDescription, ActualDeparture, ActualArrival, CertificationNo, SerialNo, StaffNo)
FK: SerialNo → Plane(SerialNo)
FK: CertificationNo, StaffNo → Pilot(CertificationNo, StaffNo)
FK: StaffNo → FlightAttendants(StaffNo)

Works (<u>StaffNo</u>, <u>FlightNo</u>, <u>FlightDate</u>)
FK: StaffNo → FlightAttendants(StaffNo)
FK: FlightNo, FlightDate → Flight(FlightNo, FlightDate)

Fly (<u>StaffNo</u>, <u>CertificationNo</u>, <u>FlightNo</u>, <u>FlightDate</u>)
FK: StaffNo, CertificationNo → Pilot(StaffNo, CertificationNo)
FK: FlightNo, FlightDate → Flight(FlightNo, FlightDate)

Ticket (<u>TicketNo</u>, PurchaseDate, PaymentType, FlightNo, FligthDate, TicketType, Price, IDNumber, IDType)
FK: FlightNo, FlightDate → Flight(FlightNo, FlightDate)
FK: IDNumber, IDType → Passenger(IDNumber, IDType)

Passenger (<u>IDNumber</u>, <u>IDType</u>, ContactPhone, DateOfBirth, FirstName, LastName, Address, Sex, EmailAddress)

Membership (<u>MembNo</u>, IDNumber, IDType, Points, Levels, JoinDate)
FK: IDNumber, IDType → Passenger(IDNumber, IDType)

Task 3:

The tables are in 3NF because every attribute can be determined only by the primary keys. The amount of data redundancy is minimised and there is no need to modify the ERD or normalise the tables.

Table Name	Attributes	Description	Type	Constraint
Staff	<u>StaffNo</u> HomeAddress StaffName DateJoined DOB	Staff number Staff address Staff name Date joined airline Date of birth	char(8) varchar2(50) varchar2(50) Date Date	*
OtherStaff	<u>StaffNo</u> HomeAddress StaffName DateJoined DOB JobType FK: StaffN o → Staff(StaffN o)	 Type of job	 varchar2(30)	* *
FlightAttendants	<u>StaffNo</u> HomeAddress StaffName DateJoined DOB FK: StaffN o → Staff(StaffN o)			*
Pilot	<u>StaffNo</u> <u>CertificationNo</u> CertificationDate HomeAddress StaffName DateJoined DOB FK: StaffN o → Staff(StaffN o)	Certification number Certification date	char(10) Date	 *

Training	StaffNo ProgramName StartDate FinishDate ProgramDescription HomeAddress StaffName DateJoined DOB FK: StaffNo → FlightAttendants(StaffNo)	Program name Start date of program Finish date of program Program description	varchar2(30) Date Date varchar2(200)	StartDate<=FinishDate
EmergencyContact	StaffNo Name Email Relationship PostalAddress Phone FK: StaffNo → Staff(StaffNo)	Emergency contact name Emergency contact email Relationship with staff Address of contact Phone number	varchar2(50) varchar2(30) char(15) varchar2(50) char(10)	*
Plane	SerialNo Capacity Range Type ManufactureDate ServiceDate ServicePlace ServiceDescription	Plane serial number Passenger capacity Range of plane Plane type Date of manufacturing Date of service Place of service Description of service	char(8) char(4) char(10) Varchar2(20) Date Date varchar2(30) varchar2(200)	
Trains	StaffNo ProgramName StartDate FK: StaffNo → FlightAttendants(StaffNo) FK: ProgramName, StartDate → Training(ProgramName, StartDate)			
Flight	FlightNo FlightDate OriginCity DestCity SchedDep SchedArrival FlightDescription ActualDepature ActualArrival CertificationNo SerialNo	Flight Number Date of Flight City of Departure Landing City Scheduled Takeoff Scheduled Landing Description of Flight Actual Takeoff Time Actual Landing Time	char(10) Date varchar2(50) varchar2(50) varchar2(20) varchar2(20) varchar2(50) varchar2(20) varchar2(20)	*

	StaffNo FK: SerialNo → Plane(SerialNo) FK: CertificationNo, StaffNo → Pilot(CertificationNo, StaffNo) FK: StaffNo → FlightAttendants(StaffNo)			
Works	StaffNo FlightNo FlightDate FK: StaffNo → FlightAttendants(StaffNo) FK: FlightNo, FlightDate → Flight(FlightNo, FlightDate)			>4, <=8
Fly	StaffNo CertificationNo FlightNo FlightDate FK: StaffNo, CertificationNo → Pilot(StaffNo, CertificationNo) FK: FlightNo, FlightDate → Flight(FlightNo, FlightDate)			=2
Ticket	TicketNo PurchaseDate PaymentType FlightNo FlightDate TicketType Price IDNumber IDType FK: FlightNo, FlightDate →	Ticket Number Date of Purchase Payment Type Flight Number Date of Flight Ticket Type Ticket Price Identification Number Identification Type	char(50) Date varchar2(50) Date varchar2(20) char(100) char(8) varchar(20)	PurchaseDate<=Flight Date unique

	Flight(FlightNo, Date)			
	FK: IDNumber, IDType → Passenger(IDNumber, IDType)			
Passenger	<u>IDNumber</u> <u>IDType</u> ContactPhone DateOfBirth FirstName LastName Address Sex EmailAddress	Contact Phone Number Passenger date of birth Passenger First Name Passenger Last Name Passenger Address Passenger Sex Passenger Email	char(20) date varchar2(50) varchar2(50) varchar2(100) char(1) varchar2(100)	'M' or 'F'
Membership	<u>MembshipNo</u> IDNumber IDType Points Levels JoinDate FK: IDNumber, IDType → Passenger(IDNumber, IDType)	Membership Number Amount of Points Membership Level Date Joined	char(8) char(100) varchar2(50) Date	 * *

Legend:
1. Primary key attributes are underlined
2. Only attributes marked with * allows for null values