CS 6400 Database System Concepts and Design
Individual Project Proposal

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Background: I have an undergraduate degree in Electronics and Communications Engineering, but after taking courses on Pattern Recognition, Machine Learning, Data Mining, Artificial Intelligence, and Neural Networks in my undergrad, I wanted to pursue higher education in the Machine Learning domain. I am currently pursuing the Machine Learning Specialization and I am passionate about ML. I plan to do a non-ML related project for this course, to learn about Database Management Systems and to expand my knowledge.

APPLICATION:

I will be making an Airport Management System. The users of this application will be the Airport Authorities. The entity types that will be used are:

AIRPORT(Name, City, Country)
EMPLOYEE(SSN, Fname, M, Lname, Phone#, Sex, Address, Salary, Jobtype)
HANGAR(HangarID, Location)
FLIGHT(FlightID, Airline)
AIRCRAFT(Serial#, Model, Seats)
FLIGHT CREW(Passport#, Name, Sex, Age, Job Type, Years of Experience)
MAINTENANCE(MaintenanceID, Type, Date)

and the relationship types are:

EMPLOYS(Airport_Name, Employee_SNN)
HAS(Airport_Name, HangarID)
DEPARTURE_FROM(FlightID, Airport_Name, Gate, Departure_Time)
ARRIVAL_TO(FlightID, Airport_Name, Gate, Arrival_Time)
VIA(FlightID, Aircraft_serial_number)
HAS(FlightID, Crew_passport_number)
WORKS_AT(HangarID, Employee_SSN)
UNDERGOES(Aircraft_serial_number, Maintenance_ID)
KEPT_IN(Aircraft_serial_number, HangarID)
SPECIALIZE_IN(Engineer_SSN, Aircraft_model)

(The EER Diagram is shown on the last page)

FUNCTIONALITIES:

The following are some functionalities that I'll be implementing:

1.) List the average salary of employees that have different Job Types at different airports. E.g. Comparing the average salary of Customer Service employees, Ground Level employees and Engineers/Technicians at each airport.
2.) Given an aircraft, what flights was it used on?
3.) Look up information of flights, such as the departure time for outgoing flights, arrival time for incoming flights at a particular airport.
4.) For flights from Atlanta to New York, what aircraft were used and what hangars were the planes kept in?
5.) Retrieve the phone number of the engineer/technician that works with a particular aircraft model given that an aircraft is having issues. Also retrieve the hangar ID to inform the pilot of the location of the hangar.
6.) For each aircraft, what was the last flight it was flown on and when was the last time it underwent maintenance? Format this as a report.
7.) List the aircraft that haven't been maintained since a particular date.
8.) What is the average experience of the flight crew that have worked on flights from Atlanta to Chicago?

Data, DBMS, Language:

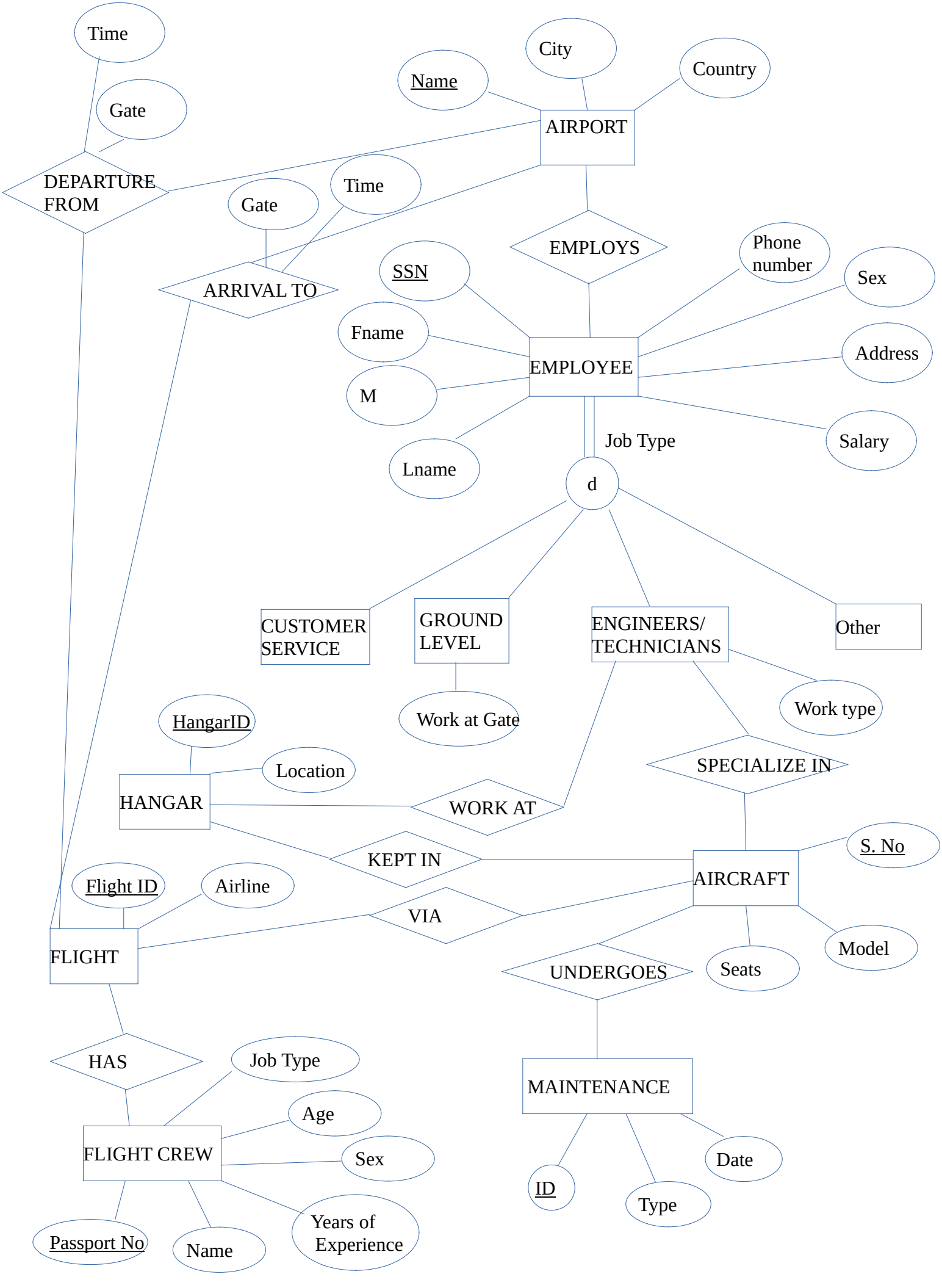
For this project, I won't be using any public data sets that are readily available. For personal information such as names, social security numbers, passport numbers, addresses etc, I will be generating fake data. For other attributes such as airport names, cities, aircraft models, hangars (and wherever possible), I will try to take real data.
I plan on using MySQL and Python to create the application.

Interface Design:

I plan on making a simple interface for this project.

Scope:

I will certainly try to implement the above functionalities. If I can think of any additional functionalities along the way, I'll try to implement them as well.


Time
Gate
DEPARTURE FROM
Name
City
Country
AIRPORT
Gate
Time
ARRIVAL TO
EMPLOYS
SSN
Phone number
Sex
Fname
EMPLOYEE
Address
M
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Job Type
Salary
d
CUSTOMER SERVICE
GROUND LEVEL
ENGINEERS/ TECHNICIANS
Other
Work at Gate
Work type
HangarID
Location
HANGAR
WORK AT
SPECIALIZE IN
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S. No
AIRCRAFT
Flight ID
Airline
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FLIGHT
Model
Seats
UNDERGOES
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Job Type
MAINTENANCE
Age
FLIGHT CREW
Sex
Date
ID
Type
Years of Experience
Passport No
Name