SKYVIEW

Problem Statement:

A flight tracking app that shows various details about all the airplanes currently active in the sky with their exact geographical location and all sorts of information.

INDEX

Link to GitHub Repo:
https://github.com/CaptainAditya/real-time-flight-tracker.git

Features:

- Search a flight by:
  - Flight #
  - Source and Destination
  - Airports
- Use of APIs to retrieve real time data

Functional Requirements:

- mysql 8.0 or above
- A web browser with JS enabled
- XAMPP

TABLES:

1. AIRLINES:

S. No.	ATTRIBUTE	DATA TYPE
01	AgeFleet	Decimal
02	CallSign	varchar(255)
03	CodeHub	Varchar(255)
04	CodeIataAirline	Varchar(255)
05	codeIcaoAirline	Varchar(255)
06	Founding	Varchar(255)
07	NameAirline	Varchar(255)
08	NameCountry	Varchar(255)
09	sizeAirline	Varchar(255)

2. FLIGHT:

S. No.	ATTRIBUTE	DATA TYPE
01	aircraftRegNumber	varchar(255)
02	airlineIcaoCode	varchar(255)
03	flightIcaoNumber	Varchar(255)
04	status	Varchar(255)

3. ARRIVALS:

S. No.	ATTRIBUTE	DATA TYPE
01	flightICAO	varchar(255)
02	arrivalIcaoCode	varchar(255)
03	arrivalIataCode	Varchar(255)

4. DEPARTURES:

S. No.	ATTRIBUTE	DATA TYPE
01	flightICAO	varchar(255)
02	depIcaoCode	varchar(255)
03	depIataCode	Varchar(255)

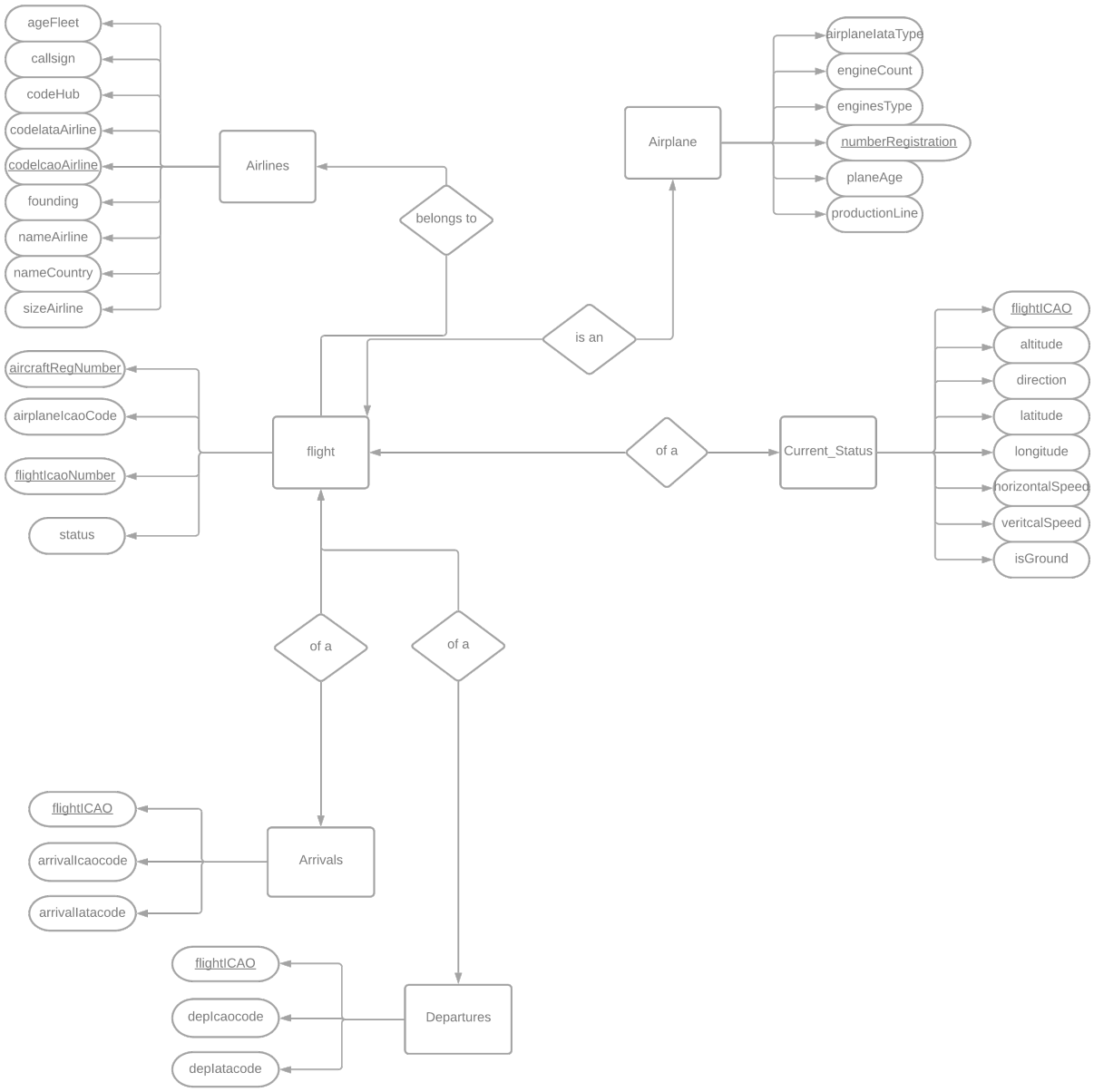
5. **AIRPLANE:**

S. No.	ATTRIBUTE	DATA TYPE
01	airplaneIataType	String
02	engineCount	integer
03	enginesType	string
04	numberRegistration	String
05	planeAge	integer
06	productionLine	string

6. **CURRENT_STATUS:**

S. No.	ATTRIBUTE	DATA TYPE
01	flightICAO	varchar(255)
02	Altitude	decimal
03	direction	decimal
04	latitude	decimal
05	longitude	decimal
06	horizontalSpeed	decimal
07	verticalSpeed	decimal
08	isGround	decimal

ER diagram:


ageFleet
callsign
codeHub
codeIataAirline
codeIcaoAirline
founding
nameAirline
nameCountry
sizeAirline
Airlines
belongs to
Airplane
airplaneIataType
engineCount
enginesType
numberRegistration
planeAge
productionLine
is an
aircraftRegNumber
airplaneIcaoCode
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of a
Current_Status
flightICAO
altitude
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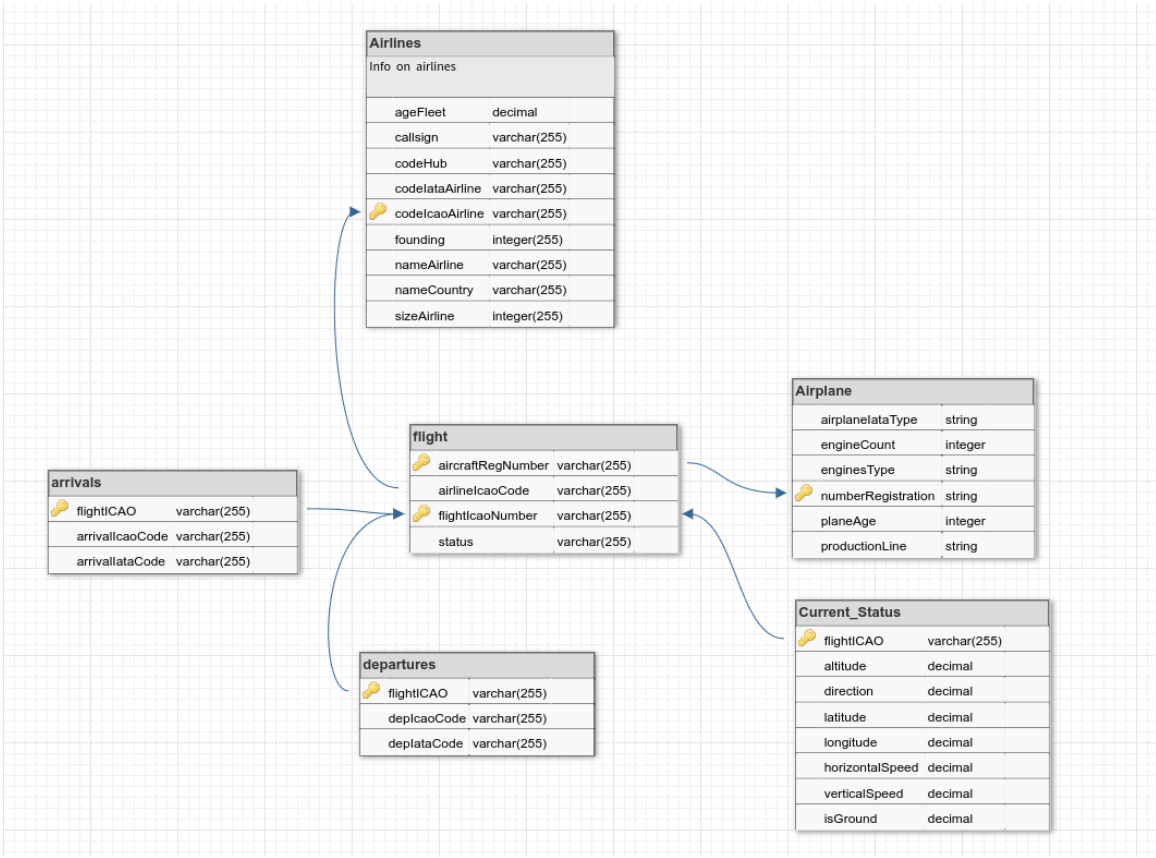
flightICAO
arrivalIcaocode
arrivalIatacode
Arrivals
flightICAO
depIcaocode
depIatacode
Departures

Relational Schema:



Functional Dependencies:

1. Airlines
   - (codeIcaoAirline)+ ={ ageFleet, callsign, codeHub, codeIataAirline, founding, nameAirline, nameCountry, sizeAirline}
2. Airplane
   - (numberRegistration)+ = {airplaneIataType, engineCount, enginesType, planeAge, productionLine}
3. flight
   - (flightIcaoNumber, aircraftRegNumber)+ = {airlineIcaoCode, status}
4. arrivals
   - (flightICAO)+ = {arrivalIcaoCode, arrivalIataCode}
5. departures
   - (flightICAO)+ = {depIcaoCode, depIataCode}
6. Current_Status
   - (flightICAO)+ = {altitude, direction, latitude, longitude, horizontalSpeed, verticalSpeed, isGround}

NORMALIZATION:

- Airlines:
  Primary key: codeIcaoAirline

  Prime attributes: codeIcaoAirline
  Non-Prime attributes: ageFleet, callsign, codeHub, codeIataAirline, founding, nameAirline, nameCountry, sizeAirline.

  There is no partial dependency. Therefore the table is in 2NF.
  There is no transitive dependency. Therefore the table is in 3NF.
  All dependencies are from candidate key. Therefore the table is BCNF.

- Airplane:
  Primary key: numberRegistration

  Prime attributes: numberRegistration
  Non-Prime attributes: airplaneIataType, engineCount, enginesType, planeAge, productionLine.

  There is no partial dependency. Therefore the table is in 2NF.
  There is no transitive dependency. Therefore the table is in 3NF.
  All dependencies are from candidate key. Therefore the table is BCNF.

- Flight:
  Primary key: flightIcaoNumber

  Prime attributes: flightIcaoNumber
  Non-Prime attributes: aircraftRegNumber, airlineIcaoCode, status

  There is no partial dependency. Therefore the table is in 2NF.
  There is no transitive dependency. Therefore the table is in 3NF.
  All dependencies are from candidate key. Therefore the table is BCNF.

- Arrivals:
  Primary key: flightICAO

  Prime attributes: flightICAO
  Non-Prime attributes: arrivalIcaoCode, arrivalIataCode

  There is no partial dependency. Therefore the table is in 2NF.
  There is no transitive dependency. Therefore the table is in 3NF.
  All dependencies are from candidate key. Therefore the table is BCNF.

- departures:
  Primary key: flightICAO

  Prime attributes: flightICAO
  Non-Prime attributes: depIcaoCode, depIataCode

  There is no partial dependency. Therefore the table is in 2NF.
  There is no transitive dependency. Therefore the table is in 3NF.
  All dependencies are from candidate key. Therefore the table is BCNF.

- Current_Status:
  Primary key: flightICAO

  Prime attributes: flightICAO
  Non-Prime attributes: altitude, direction, latitude, longitude,
  horizontalSpeed, verticalSpeed, isGround

  There is no partial dependency. Therefore the table is in 2NF.
  There is no transitive dependency. Therefore the table is in 3NF.
  All dependencies are from candidate key. Therefore the table is BCNF.

SQL OPERATIONS:

```
CREATE TABLE `Airlines` (
     `ageFleet` DECIMAL,
     `callsign` varchar(255),
     `codeHub` varchar(255),
     `codeIataAirline` varchar(255),
     `codeIcaoAirline` varchar(255),
     `founding` INT(255),
     `nameAirline` varchar(255),
     `nameCountry` varchar(255),
     `sizeAirline` INT(255),
     PRIMARY KEY (`codeIcaoAirline`)
);

CREATE TABLE `Airports` (
     `codeIataAirport` varchar(255),
     `codeIcaoAirport` varchar(255) ,
     `latitudeAirport` DECIMAL(65),
     `longitudeAirport` DECIMAL(65),
     `nameAirport` varchar(255),
     `nameCountry` varchar(255),
     `time_zone` varchar(255),
     PRIMARY KEY (`codeIcaoAirport`)
);

CREATE TABLE `Airplane` (
     `airplaneIataType` VARCHAR(255) ,
     `engineCount` INT ,
     `enginesType` VARCHAR(255) ,
     `numberRegistration` VARCHAR(255) ,
     `planeAge` INT,
     `productionLine` VARCHAR(255) ,
     PRIMARY KEY (`numberRegistration`)
);

CREATE TABLE `departures` (
     `flightICAO` varchar(255) UNIQUE,
     `depIcaoCode` varchar(255),
     `depIataCode` varchar(255)
);

CREATE TABLE `arrivals` (
     `flightICAO` varchar(255) UNIQUE,
     `arrivalIcaoCode` varchar(255) ,
     `arrivalIataCode` varchar(255)
);

CREATE TABLE `flight` (
     `aircraftRegNumber` varchar(255) UNIQUE,
     `airlineIcaoCode` varchar(255) UNIQUE,
     `flightIcaoNumber` varchar(255) UNIQUE,
     `status` varchar(255) ,
     PRIMARY KEY
(`aircraftRegNumber`,`airlineIcaoCode`,`flightIcaoNumber`)
);
```

```
CREATE TABLE `Current_Status` (
     `flightICAO` varchar(255) UNIQUE,
     `altitude` DECIMAL ,
     `direction` DECIMAL ,
     `latitude` DECIMAL ,
     `longitude` DECIMAL ,
     `horizontalSpeed` DECIMAL ,
     `verticalSpeed` DECIMAL ,
     `isGround` DECIMAL ,
     PRIMARY KEY (`flightICAO`)
);

ALTER TABLE `departures` ADD CONSTRAINT `departures_fk0` FOREIGN
KEY (`flightICAO`) REFERENCES `flight`(`flightIcaoNumber`);

ALTER TABLE `arrivals` ADD CONSTRAINT `arrivals_fk0` FOREIGN KEY
(`flightICAO`) REFERENCES `flight`(`flightIcaoNumber`);

ALTER TABLE `flight` ADD CONSTRAINT `flight_fk0` FOREIGN KEY
(`aircraftRegNumber`) REFERENCES `Airplane`(`numberRegistration`);

ALTER TABLE `flight` ADD CONSTRAINT `flight_fk1` FOREIGN KEY
(`airlineIcaoCode`) REFERENCES `Airlines`(`codeIcaoAirline`);

ALTER TABLE `Current_Status` ADD CONSTRAINT `Current_Status_fk0`
FOREIGN KEY (`flightICAO`) REFERENCES
`flight`(`flightIcaoNumber`);
```