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CS 3200

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1. For the relation represented by all of the columns in the CSV file, define all functional dependencies and list them.

Relation: R(iid, date, airline, flightNumber, dep.airport, incidentType, severity, delay, num.injuries, reported.by, aircraft)

- iid \rightarrow date, airline, flightNumber, dep.airport, incidentType, severity, delay, num.injuries, reported.by, aircraft
 - (date, airline, flightNumber) \rightarrow dep.airport, aircraft
2. Using the functional dependencies and the rules of normalization, decompose the relational from the CSV into several relations that all satisfy 3NF; give the relations reasonable names.

Airline:

- Attributes: airlineCode (Primary Key)

Airport:

- Attributes: depAirport (PK)

Aircraft:

- Attributes: aircraftName (PK)

IncidentType:

- Attributes: incidentName (PK)

Severity:

- Attributes: severityType (PK)

Reporter:

- Attributes: reporterName (PK)

Flight:

- Attributes: airlineCode, flightNumber, date, depAirport, aircraftName
- Primary Key: (airlineCode, flightNumber, date)
- Foreign Keys:
 - o airlineCode → Airline(airlineCode)
 - o depAirport → Airport(depAirport)
 - o aircraftName → Aircraft(aircraftName)

Incident:

- Attributes: iid, airlineCode, flightNumber, date, incidentName, severityType, delay, numInjuries, reporterName
- Primary Key: iid
- Foreign Keys:
 - o (airlineCode, flightNumber, date) → Flight(airlineCode, flightNumber, date)
 - o incidentName → IncidentType(incidentName)
 - o severityType → Severity(severityType)
 - o reporterName → Reporter(reporterName)

3. For the relations resulting from the normalization, create an ERD in the IE (Crow's Feet) notation. Add all attributes, attribute name, primary and foreign keys, data types, and entity descriptions. You may use any modeling tool of your choosing, e.g., LucidChart or Mermaid. Embed the ERD into a document. Save the document containing your database design as a PDF.

