

CS:4400 ER Diagram

Team #5

Entities (strong, weak with description)

Strong Entities:

- Users – The most important entity in our database. Everything revolves around user's actions. The user interacts with other entities to use the airline booking system effectively.
- Flights – The entity on which every other entity would be dependent on. It contains major information regarding flights, their details and all the general information.
- Payments – Once a user and flight interaction are done, everything comes down to payment. Payment is the entity that books the ticket and gives the confirmation to the user that his/ her booking is done.
- Aircrafts – These contain the details about the aircrafts and the total number of economy or first-class seats that are available.
- Admin – Admin is the entity that has control over everything and can change any data.
- News – Independent entity that is more about the background display news in the website.
- Contact Us – Independent entity which has details about whom to contact.

Weak Entities:

- Bookings – A bridging entity between Users and Flights. Generates a unique id for each booking which helps when any further intervention is needed.
- Airports – These are the details about the airport which are dependent on the from and to location of Flights.
- Schedule – Schedule is dependent on the dates provided as it can relate each date with a single day.

Relationships (provide at least one direction)

- Bookings have Users and Flights.
- Flights get information from Aircrafts, Schedule and Airports.
- Users pay for the flight using Payment option.
- Admin, News, Contact Us are standalone tables for robust design.

Attributes (only names will do if they match what has been described in Data Attributes. Inside the Box simply list PK and FK and defer other attributes in textual information before the diagram. If an entity has been described once that is good enough)

- **Users** – UserID (PK), Title, FirstName, MiddleName, LastName, Preferred Name, Sex, DOB, Street, City, ZipCode, State, Country, Phone, Email, Username, Password, Security Question, Security Answer, HawkAdvantage, Miles
- **Bookings** – BookingID, Seat Number, Class, UserID (FK), FlightID (FK)
- **Flights** – FlightID (PK) Aircraft ID (FK), From(FK), To(FK), Depart Time, Duration, FlightStatus, PriceEconomy, PriceFirstClass, BookedEconomySeats, BookedFirstClassSeats
- **Airports** – Code(PK), Name, City, State, Country
- **Aircrafts** – AircraftID (PK), TotalEconomySeats, TotalFirstClassSeats
- **Schedule** – Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday, FlightID (FK)
- **Payments** – CardNumber(PK), CardType, ExpirationDateMonth, ExpirationDateYear, CVV, Name,
- **Admin** – Username(PK), Password
- **News** – Headline, Date, Picture, Content
- **Contact Us** – Phone, Email

Cardinality (use 0:N range notation) and **Modality** (Must be, May be)

Users have 0...N cardinality with Bookings (User may have many bookings)

Flights have 0...N cardinality with Bookings (Flight may have many bookings)

Schedules have 1.....1 cardinality with Flights (Each flight must have its own schedule)

Airports have 1....N cardinality with Flights (Airports must have available flights)

Aircrafts have 1....N cardinality with Flights (Aircrafts must be assigned to flights)

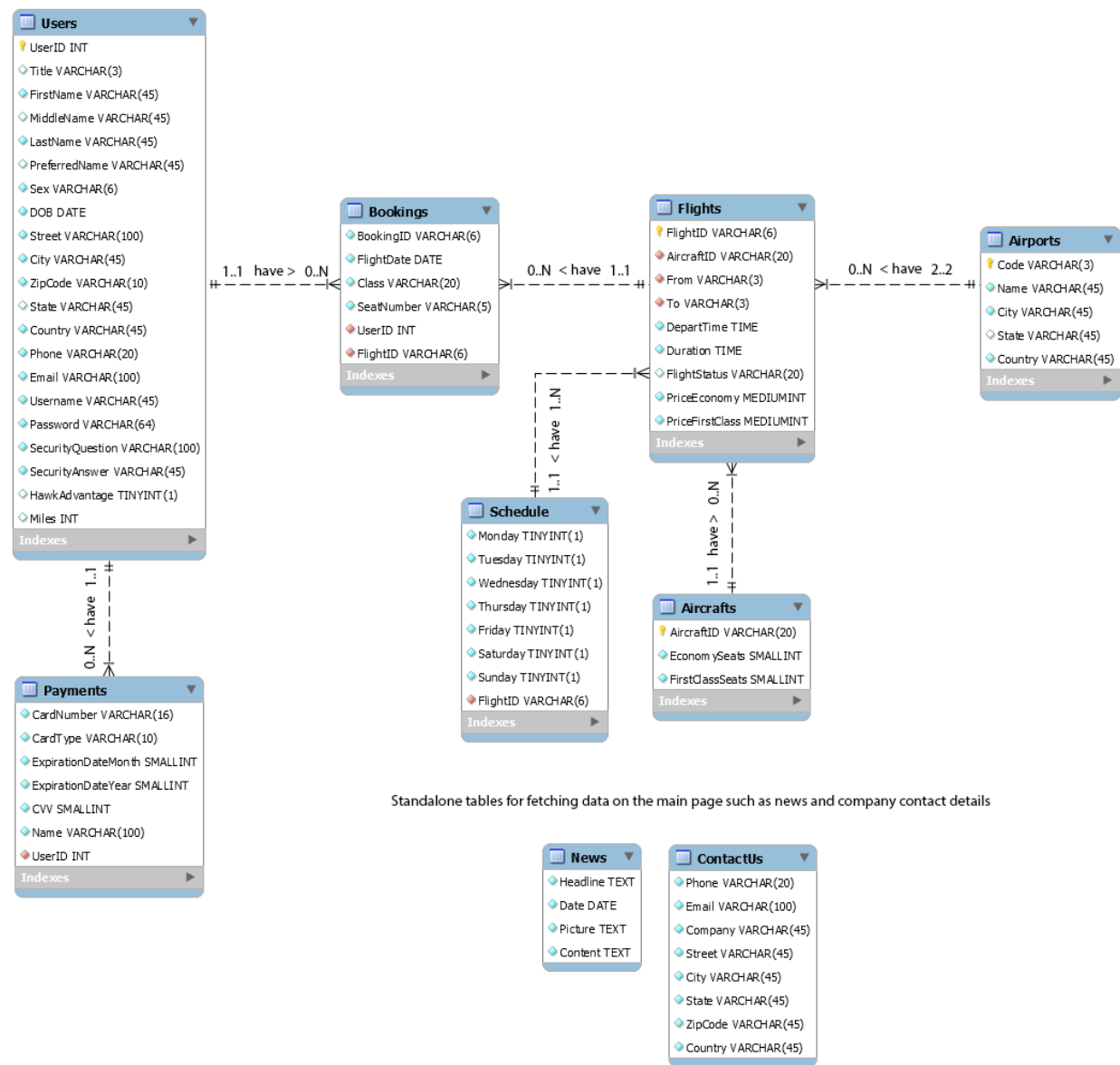
Users have 0...N cardinality with Payments (Users may have many payment options)

Admin, News, Contact Us are standalone tables with no cardinality

Primary Keys and Foreign Keys

- Primary Keys – UserID, FlightID, Code, AircraftID, CardNumber, Username
- Foreign Keys – UserID, FlightID, AircraftID, From, To

Final ER Diagram



Standalone tables for fetching data on the main page such as news and company contact details