Requirement analysis

This requirement analysis addresses the necessary user group roles in the Airbnb database and their performed actions respectively. It also provides an overview of the kind of data and functions required for creating an exemplary Airbnb database. It concludes with an Entity Relationship Model which illustrates which entities have to be implemented in the following steps, along with their attributes and relationships between them.

1. Roles and performed actions

Guests:
Guests use Airbnb to search for and book accommodations for their trips.

Actions:

- Searching for available accommodations based on location, dates, and preferences
- Viewing available information about listed properties, including descriptions, amenities, and reviews
- Booking accommodations
- Leaving reviews and ratings for visited accommodations and their hosts
- Communicating with hosts through the messaging system

Hosts:
Hosts are accommodation owners who offer their properties for rent on Airbnb.

Actions:

- Creating and managing property listings by providing information, such as property type, location, amenities, pricing, and availability
- Receiving booking requests from guests and confirming or declining them
- Communicating with guests through the messaging system
- Managing bookings, updating availability, handling cancellations
- Leaving ratings for Guests

Administrators:
System administrators have the responsibility of managing and overseeing the Airbnb platform.

Actions:

- Monitoring and handling reported issues, disputes, or violations of terms and policies using a ticket system

2. Required Data and Functions

a) User Data:

- User profiles: E-mail address, phone number, address
- Login data: Username, password

b) Object Data:

- Property listings: Address, amenities, pricing, availability, rules
- Booking data: Records of bookings, including dates, payment information, status (confirmed, pending, canceled)

c) Location Data:

- Addresses of Listings
- Addresses of Users

d) Communication Data:

- Messaging system: Stores messages exchanged between guests and hosts for inquiries, bookings, and general communication

e) Rating Data:

- Guest reviews and ratings: Feedback left by guests about their stay experiences and ratings for accommodations and hosts
- Host reviews and ratings: Feedback left by hosts about the guests that stayed at their accommodations

f) Administrative Data:

- Reported issues: Information related to reported incidents, disputes, or violations
- Administrator data: Admins are not considered to be regular users. Therefore, their data falls under the category of administrative data

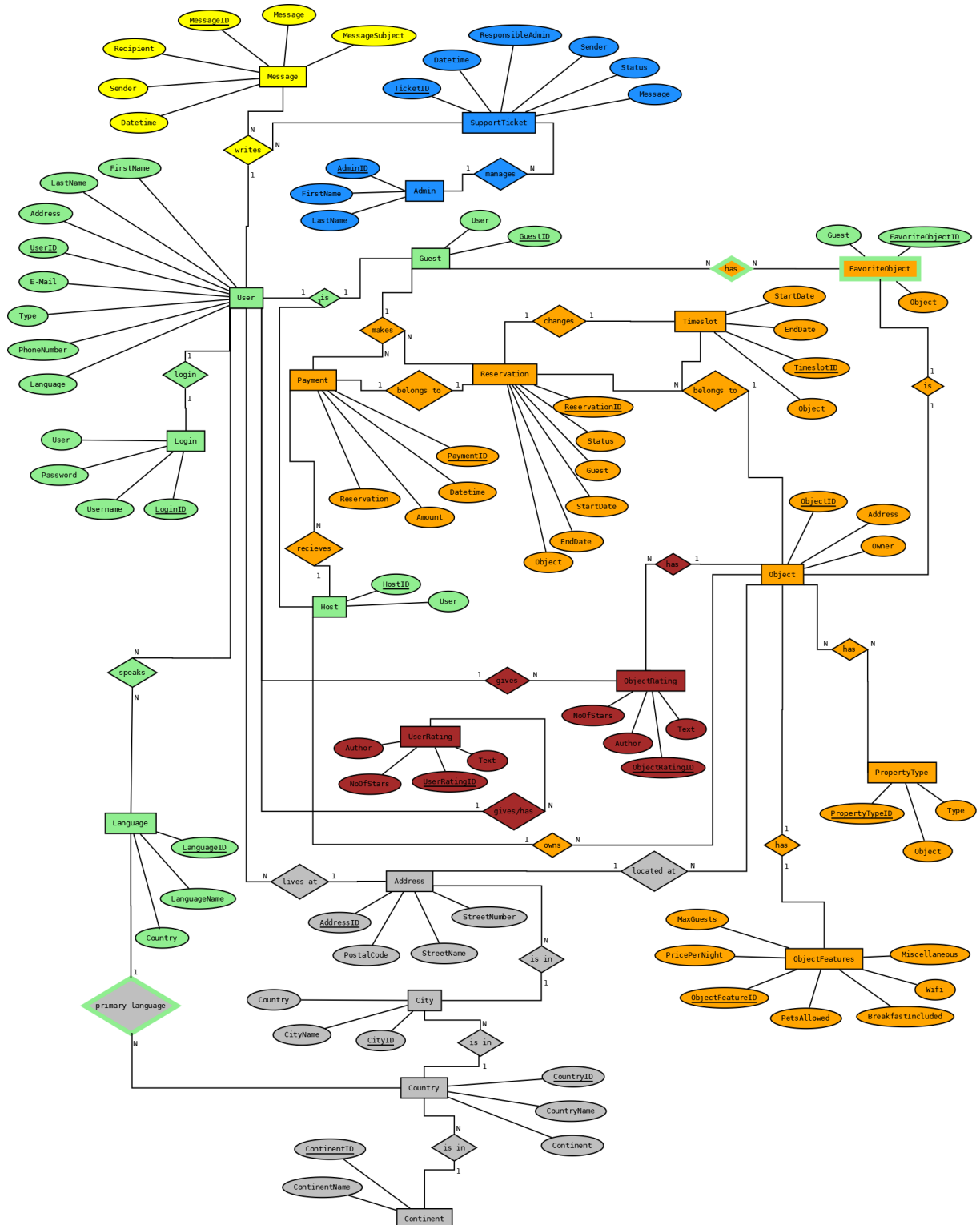# Entity Relationship Model and Data dictionary

Figure 1 ERM created with Dia in Chen notation.
Green: User Data, Orange: Object Data, Grey: Location Data, Yellow: Communication Data, Red: Rating Data, Blue: Administrative Data.
Elements with two colors cannot be assigned to only one data category and are therefore divided into two categories.

Table	Attribute name	Data Type	Description	Data Group
Guest	GuestID	INT	Identifier	a) User Data
Guest	User	INT	Foreign Key from User table	a) User Data
Host	HostID	INT	Identifier	a) User Data
Host	User	INT	Foreign Key from User table	a) User Data
Language	LanguageID	INT	Identifier	a) User Data
Language	LanguageName	VARCHAR(20)	Name of the language	a) User Data
Language	Country	INT	Foreign Key from Country table	a) User Data
Login	LoginID	INT	Identifier	a) User Data
Login	User	INT	Foreign Key from User table	a) User Data
Login	Username	VARCHAR(20)	Username of the User	a) User Data
Login	Password	VARCHAR(20)	Password of the User	a) User Data
User	UserID	INT	Identifier	a) User Data
User	FirstName	VARCHAR(100)	First name of the User	a) User Data
User	LastName	VARCHAR(100)	Last name of the User	a) User Data
User	Address	INT	Foreign Key from Address table	a) User Data
User	EMail	VARCHAR(100)	E-Mail address of the User	a) User Data
User	Type	VARCHAR(5)	"Guest", "Host" or "Both"	a) User Data
User	PhoneNumber	VARCHAR(100)	Phonenumber of the User	a) User Data
User	Language	INT	Foreign Key from Language table	a) User Data
FavoriteObject	FavoriteObjectID	INT	Identifier	b) Object Data
FavoriteObject	Object	INT	Foreign Key from Object table	b) Object Data
Object	ObjectID	INT	Identifier	b) Object Data
Object	Address	INT	Foreign Key from Address table	b) Object Data
Object	Owner	INT	Foreign Key from Host table	b) Object Data
ObjectFeatures	ObjectFeatureID	INT	Identifier	b) Object Data
ObjectFeatures	PetsAllowed	BOOL	Yes/No	b) Object Data
ObjectFeatures	BreakfastIncluded	BOOL	Yes/No	b) Object Data
ObjectFeatures	Wifi	BOOL	Available/Not available	b) Object Data
ObjectFeatures	PricePerNight	FLOAT(6, 2)	Current price per night for the object	b) Object Data
ObjectFeatures	MaxGuests	INT	Maximal number of guest allowed	b) Object Data
ObjectFeatures	Miscellaneous	VARCHAR(500)	Other features	b) Object Data
ObjectFeatures	Object	INT	Foreign Key from Object table	b) Object Data
Payment	PaymentID	INT	Identifier	b) Object Data
Payment	Amount	FLOAT(8, 2)	Total sum paid by the guest	b) Object Data
Payment	Datetime	DATETIME	Datetime of payment	b) Object Data
Payment	Reservation	INT	Foreign Key from Reservation table	b) Object Data
PropertyType	PropertyTypeID	INT	Identifier	b) Object Data
PropertyType	Type	VARCHAR(50)	Type of property (e.g. "Loft", "Studio", "Apartment")	b) Object Data
PropertyType	Object	INT	Foreign Key from Object table	b) Object Data
Reservation	ReservationID	INT	Identifier	b) Object Data
Reservation	Status	VARCHAR(100)	Did the host already confirm the reservation? (e.g. "Pending", "Accepted", "Declined")	b) Object Data
Reservation	Guest	INT	Foreign Key from Guest table	b) Object Data
Reservation	StartDate	DATE	First day of reservation	b) Object Data
Reservation	EndDate	DATE	Last day of reservation	b) Object Data
Reservation	Object	INT	Foreign Key from Object table	b) Object Data
Timeslot	TimeslotID	INT	Identifier	b) Object Data
Timeslot	Object	INT	Foreign Key from Object table	b) Object Data
Timeslot	StartDate	DATE	First day of possible booking period	b) Object Data
Timeslot	EndDate	DATE	Last day of possible booking period	b) Object Data
Address	AddressID	INT	Identifier	c) Location Data
Address	StreetName	VARCHAR(100)	Name of the street	c) Location Data
Address	StreetNumber	VARCHAR(10)	Streetnumber	c) Location Data
Address	PostalCode	VARCHAR(20)	Postalcode	c) Location Data
City	CityID	INT	Identifier	c) Location Data
City	CityName	VARCHAR(50)	Name of the city	c) Location Data
City	Country	INT	Foreign Key from Country table	c) Location Data
Continent	ContinentID	INT	Identifier	c) Location Data
Continent	ContinentName	VARCHAR(20)	Name of the continent	c) Location Data
Country	CountryID	INT	Identifier	c) Location Data
Country	CountryName	VARCHAR(50)	Name of the country	c) Location Data
Country	Continent	INT	Foreign Key from Continent table	c) Location Data
Message	MessageID	INT	Identifier	d) Communication Data
Message	Message	VARCHAR(1000)	Message text	d) Communication Data
Message	MessageSubject	VARCHAR(100)	Subject of the message	d) Communication Data
Message	Recipient	INT	Foreign Key from User table	d) Communication Data
Message	Sender	INT	Foreign Key from User table	d) Communication Data
Message	Datetime	DATETIME	Datetime the message was sent	d) Communication Data
ObjectRating	ObjectRatingID	INT	Identifier	e) Rating Data
ObjectRating	Text	VARCHAR(500)	Rating text	e) Rating Data
ObjectRating	NumberOfStars	INT	Number of Stars given by a User	e) Rating Data
ObjectRating	Author	INT	Foreign Key from User table	e) Rating Data
UserRating	UserRatingID	INT	Identifier	e) Rating Data
UserRating	Text	VARCHAR(500)	Rating text	e) Rating Data
UserRating	NumberOfStars	INT	Number of Stars given by a User	e) Rating Data
UserRating	Author	INT	Foreign Key from User table	e) Rating Data
Admin	AdminID	INT	Identifier	f) Administrative Data
Admin	FirstName	VARCHAR(100)	First name of the Admin	f) Administrative Data
Admin	LastName	VARCHAR(100)	Last name of the Admin	f) Administrative Data
SupportTicket	TicketID	INT	Identifier	f) Administrative Data
SupportTicket	Datetime	DATETIME	Datetime of the inquiry	f) Administrative Data
SupportTicket	ResponsibleAdmin	INT	Foreign Key from Admin table	f) Administrative Data
SupportTicket	Sender	INT	Foreign Key from User table	f) Administrative Data
SupportTicket	Status	VARCHAR(100)	Status of the Ticket (e.g. "Pending", "Done")	f) Administrative Data
SupportTicket	Message	VARCHAR(500)	Inquiry text	f) Administrative Data

Figure 2 Data Dictionary created with Microsoft Excel
The color code corresponds to the one in the ERM.