Tutorial: Multi Fact
The Swappers Holiday Data Warehouse

Swappers is a new online house swap service where users can advertise their houses for swap with others for holiday purposes. To be able to participate, users need to register as a member, and currently, the membership is free.

The Website maintains feedbacks from existing users. When users leave feedbacks, they can divide them into two categories. The first is their satisfaction level with the destination accommodation, and the second is their satisfaction level with how their own houses are being taken care of during the Swappers program.

Currently, the operational database system consists of several tables. These tables store swap data from 2007 to 2011. The tables can be found at `dw_swapper`, thus you can for example execute the following query:

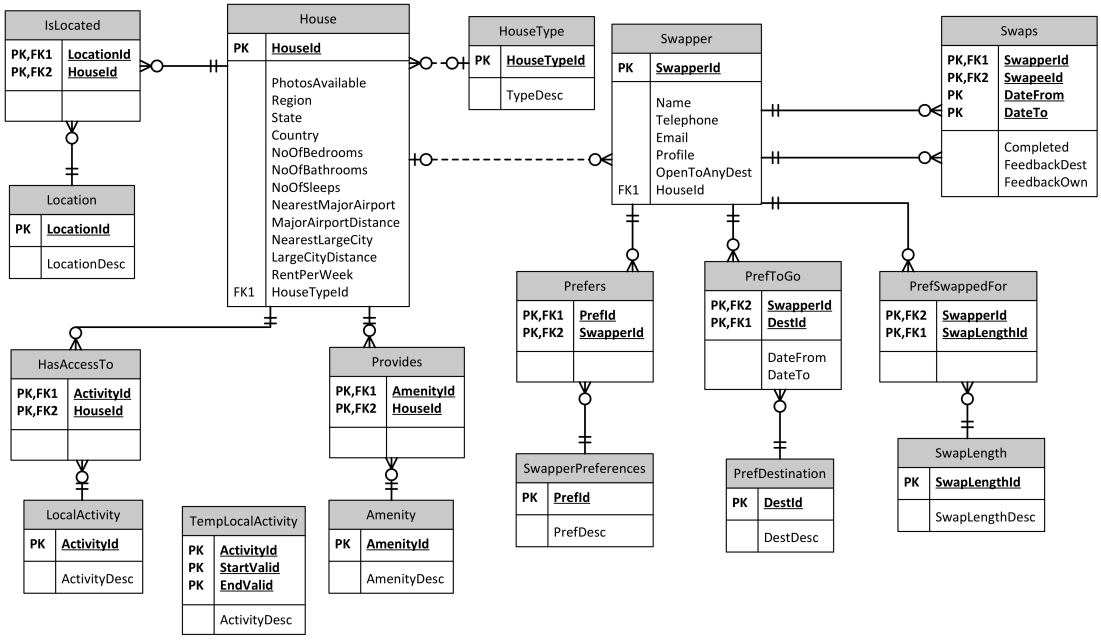
```
select * from dw_swapper.<table_name>;
```

The data definition of each table in `dw_swapper` is as follows:

Table Name (PK/FK)	Attributes and Data Types		Notes
House PRIMARY KEY: HouseID FOREIGN KEY: HouseTypeID	HouseID PhotosAvailable Region State Country NoOfBedrooms NoOfBathrooms NoOfSleeps NearestMajorAirport MajorAirportDistance NearestLargeCity LargeCityDistance RentPerWeek HouseTypeID	NUMERIC CHAR VARCHAR VARCHAR VARCHAR NUMERIC NUMERIC NUMERIC VARCHAR NUMERIC VARCHAR NUMERIC NUMERIC NUMERIC	This table stores the houses details. The value of attribute RentPerWeek is in USD.
Swapper PRIMARY KEY: SwapperID FOREIGN KEY: HouseID	SwapperID Name Telephone Email Profile OpenToAnyDest HouseID	NUMERIC VARCHAR VARCHAR VARCHAR VARCHAR CHAR NUMERIC	This table stores the website members' details. Attribute OpenToAnyDest indicates whether a swapper is willing to go to any destination.
HouseType PRIMARY KEY: HouseTypeID	HouseTypeID TypeDesc	NUMERIC VARCHAR	This table stores the house types.
Swaps PRIMARY KEY: SwapperID, SwapeeID, DateFrom, DateTo FOREIGN KEYS: Swapper ID, SwapeeID	SwapperID SwapeeID DateFrom DateTo Completed FeedbackDest FeedbackOwn	NUMERIC NUMERIC DATE DATE CHAR NUMERIC NUMERIC	This table stores the swap transactions between the website members.
	PrefID	NUMERIC	

SwapperPreferences PRIMARY KEY: PrefID	PrefID PrefDesc	NUMERIC VARCHAR	This table stores the user preferences.
Prefers PRIMARY KEY: PrefID, Swapper FOREIGN KEYS: PrefID, SwapperID	PrefID SwapperID	NUMERIC NUMERIC	
PrefDestination PRIMARY KEY: DestID	DestID DestDesc	NUMERIC VARCHAR	This table stores the possible preferred destinations. Note there is destination called “Anywhere”.
PrefToGo PRIMARY KEY: SwapperID, DestID FOREIGN KEYS: SwapperID, DestID	SwapperID DestID DateFrom DateTo	NUMERIC NUMERIC VARCHAR VARCHAR	This table stores each member preferred destinations with the available period. Note Attributes DateFrom and DateTo are VARCHAR because they could be “Anytime”.
SwapLength PRIMARY KEY: SwapLengthID	SwapLengthID SwapLengthDesc	NUMERIC VARCHAR	This table stores possible swap duration. Example: ShortTerm, Long Term, Weekends, etc.
PrefSwappedFor PRIMARY KEY: SwapperID, SwapLengthID FOREIGN KEYS: SwapperID, SwapLengthID	SwapperID SwapLengthID	NUMERIC NUMERIC	
Location PRIMARY KEY: LocationID	LocationID LocationDesc	NUMERIC VARCHAR	This table stores the NATURAL locations of houses. Example: Beach/Coastal, Mountain/Ranges, River/Creek/Lake, etc.
IsLocated PRIMARY KEY: LocationID, HouseID FOREIGN KEYS: LocationID, HouseID	LocationID HouseID	NUMERIC NUMERIC	
Amenity PRIMARY KEY: AmenityID	AmenityID AmenityDesc	NUMERIC VARCHAR	This table stores the possible house amenities. Example: Bath, DVD, TV, BBQ, etc.
Provides PRIMARY KEY: AmenityID, HouseID FOREIGN KEY(S): AmenityID, HouseID	AmenityID HouseID	NUMERIC NUMERIC	
LocalActivity PRIMARY KEY: ActivityID,	ActivityID ActivityDesc	NUMERIC VARCHAR	This table stores the possible local activities near houses.
HasAccessTo PRIMARY KEY: ActivityID, House FOREIGN KEY(s): ActivitiyID, HouseID	ActivityID HouseID	NUMERIC NUMERIC	
TempLocalActivity PRIMARY KEY: ActivityID, StartValid, EndValid	ActivityID ActivityDesc StartValid EndValid	NUMERIC VARCHAR DATE DATE	This table stores the possible local activities near houses and their temporal validity period (for question 4 only)

The E/R diagram of the operational database is shown below. A holiday house is located in a certain location, has access to local activities, and has amenities. A house is owned by a person, whom has his/her own preferences to go to certain destinations and for a period of time. Feedbacks are also recorded in the swaps table.



Tasks:

Design a data warehouse for the above E/R diagram.

1. List potential fact measures
2. List potential dimensions
3. Analyze the fact measures listed in task#1 above, by using each of the dimensions listed in task#2 above.
4. Based on your analysis in task #3, design a star schema.
5. Explore the 18 tables from the operational database.
6. Create the dimension and fact tables.