

# Advanced Databases

Name: Eryk Szlachetka

Student Number: C14386641

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Lab: 5

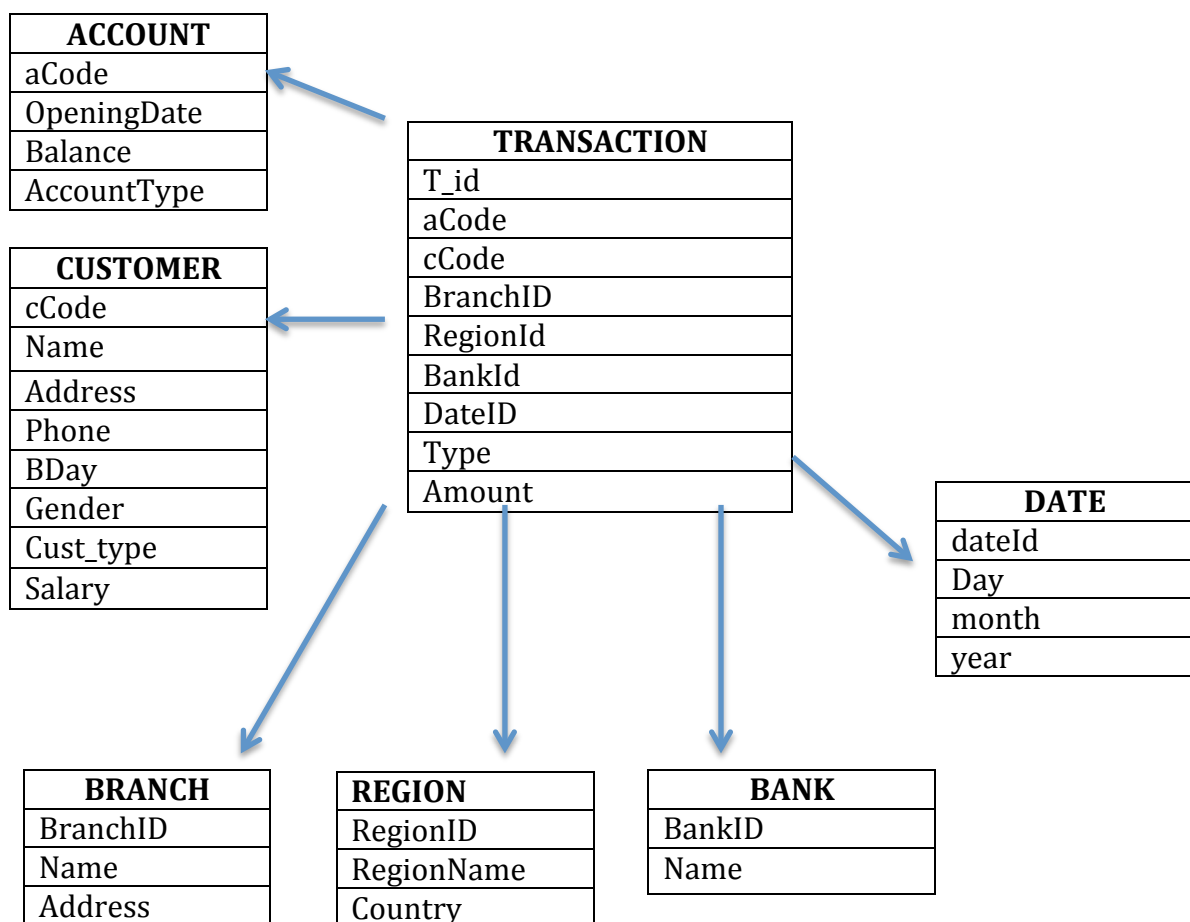
## Exercise 1

1. Produce a star schema for the above ER diagram. The diagram should support queries about the total amount of the transactions that have been done at different period of times at each branch, and by which type of customer. Justify your choices (grain, facts and dimensions)

Grain – A **daily** transaction for a **specific account** type and **specific customer** and **specific branch** for **specific bank** in a **specified region**.

Facts – Type and Amount

Dimensions – Account, Customer, Branch, Region, Bank and Date.



2. Using your model, write an SQL query to get the total amount of all the transactions over students accounts for each branch in 2009

```

select count(*) from TRANSACTIONS where DateID in (select dateId from DATE where year
= 2009) and aCode in (select aCode from ACCOUNT where AccountType = 'student');
  
```

## Exercise 2

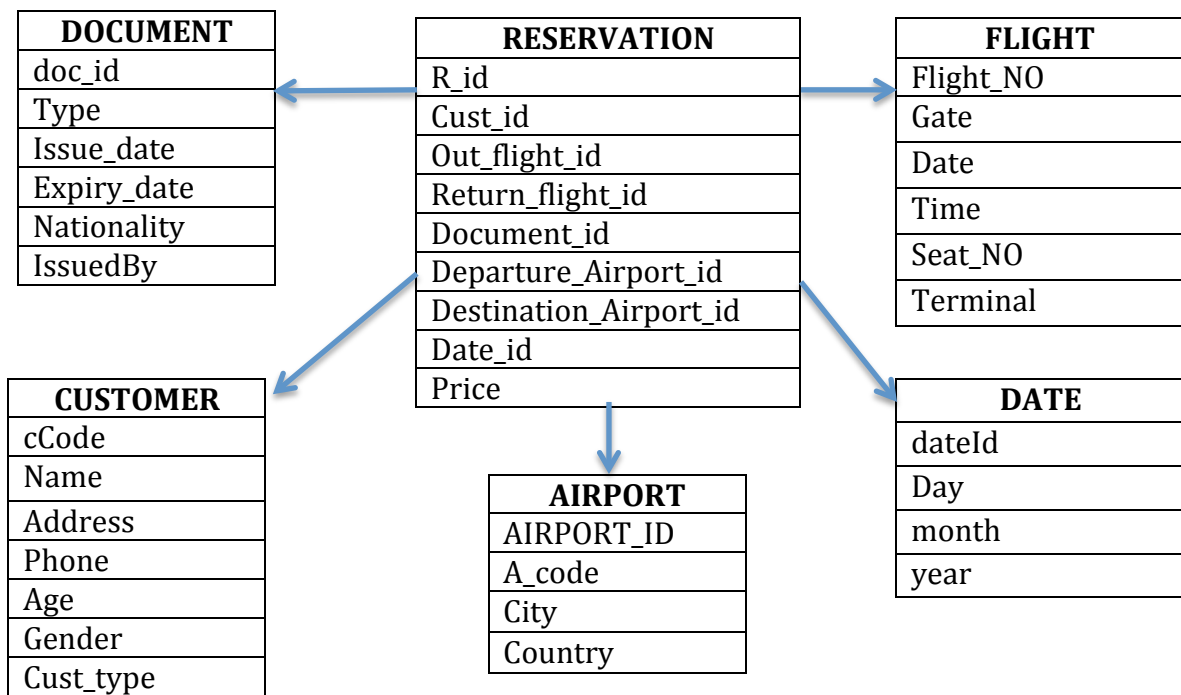
### Flight reservation system.

A description of the business and the business questions your model is supposed to answer

As part of the lab I have decided to do an online flight reservation system. This is system has to be able to reserve a flight for a particular destination on a particular date for a particular user. The system has to store information about the user and the document user uses to check-in with.

The questions that the system is supposed to answer are as follow:

- Display a specific day's reservations from Dublin Airport, traveling from T1 (terminal 1) for all Irish citizens that are under 25 years old that used a passport for check in instead of any other identification document (e.g. Driving License can be used for EU citizens to travel within Europe).
- A total yearly amount earned by Dublin Airport by providing flights from DUB (Dublin, Ireland) to ALC (Alicante, Spain) for 2016.
- The dimensional model (start schema)



Two sample SQL queries to show how the dimensional model can be used to answers the business questions selected.

```
Select count(*) from RESERVATION where Date_id in
(select dateId from DATE where day = 23 and month = 'dec' and year = 2016)
and out_flight_id in
(select Flight_NO from FLIGHT where Terminal = 'T1')
and Departure_Airport_id in
(select airport_id from AIRPORT where A_code = 'DUB' and Country = 'IRL')
and Cust_id in
(select cCode from CUSTOMER where age < 25)
and Document_id in
(select doc_id from DOCUMENT where type = 'PASS');
```

```
select count(price) from RESERVATION where
destination_airport_id in
(select airport_id from AIRPORT where a_code = 'ALC' and Country = 'ESP')
and departure_airport_id in
(select airport_id from AIRPORT where a_code ='DUB' and Country ='IRL')
and date_id in
(select dateId from DATE where year = 2016);
```