

# Assignment 4 : Trigger

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## 1. Introduction

Each resident in mainland China has a unique 18-digit identity card number. When you play online game like Honor of Kings, you need to enter your ID and name when you register. The game decides how many hours user can play the game each game. However, some teenagers may enter fake ID number trying to cheat the system so he/ she can play the game all day long. Suppose you are the database administrator of Honor of Kings, you are required to write a trigger to prevent illegal ID number insert to the game database.

## 2. How does the China ID Card Citizen Identity Number work?

The first 6 digits is the address code which refers to a specific administrative division. It indicates where the resident was born. GB/T 2260 (a national standard) defines address codes for all administrative divisions in China. We also provide you a table `district` which can help you check whether the address code in the ID number is valid or not.

The 7-14 digits is the birthday of the resident. The format is `YYYYMMDD`. For example, if you was born in August 17th, 1926. The code for birthday is `19260817`. In this assignment, we assume all residents were born on or after January 1th, 1900.

The 15-17 digits is the order number. Odd number indicates the resident is male. Even number indicates the resident is female. For example, `007` means the resident is male, while `666` means the resident is female.

The last digit is the checksum.

Here is the algorithm for checksum (ISO 7064:1983.MOD 11-2).

$$S = \sum_{i=1}^{17} w_i * d_i$$
$$Checksum = (12 - (S \bmod 11)) \bmod 11$$
$$w_i = 2^{(18-i)} \bmod 11$$

$d_i$  is the  $i$ -th digit of ID number.

## 3. What you need to do?

Given the database which contains two tables `district` and `people`, you need to write a trigger and a function. The trigger is triggered before the data is inserted into table `people`. The function for trigger check whether the ID number is valid or not.

The format of insertion statement is shown as follow.

```
INSERT INTO people values (ID, Name);
```

`ID` and `name` are string. `ID` is the ID number. `name` is the name of user.

If the ID number is not valid. The function should throw the exception and stop the insertion.

If the ID number is valid. The new inserted row need the value of `birthday` and `address` which are according to the ID number.

The format of `address` : [province],[city],[district]

If any of province, city or district doesn't exists, you can ignore it.

The format of `birthday` : substring(ID, 7, 8)

Several successful test cases:

```
insert into people (id, name) values ('110101200402232714', 'name1');
insert into people (id, name) values ('440303210005112718', 'name2');
insert into people (id, name) values ('440300199003162929', 'name3');
insert into people (id, name) values ('540000199905203221', 'name3');
```

Result:

	id	name	address	birthday
1	110101200402232714	name1	北京市, 东城区	20040223
2	440303210005112718	name2	广东省, 深圳市, 罗湖区	21000511
3	440300199003162929	name3	广东省, 深圳市	19900316
4	540000199905203221	name3	西藏自治区	19990520

You can try the function: `string_agg`

```
select string_agg(x.name, ',')
from (
    select name
    from district
    where code in ('110000', '110100', '110101')
    order by code) x;
```

## 4. What to submit?

You need to submit two files:

`people_trigger.sql` : it creates trigger for given database.

`valid_check.sql` : it defines the function for trigger.

## 5. Rules

1. This assignment is based on PostgreSQL.
2. The **file name** of procedure should be '**valid\_check.sql**', the **file name** of trigger should be '**people\_trigger.sql**' and the name of table for trigger must be '**people**'.
3. You need to make sure that if we execute those files in this order '**valid\_check.sql**', '**people\_trigger.sql**', valid data can be imported successfully.
4. You need to make sure that there is only one function in **valid\_check.sql**
5. Your insert results of trigger must be strictly followed the description and the data in result.
6. Submit those two .sql files are enough, do not compress them into one document.
7. Please submit those queries into **sakai website** as soon as possible, so that you can get chance to receive feedback before deadline. **After the deadline, we will check the assignment automatically by a script and then given your grade, at that time, any argument about your grade of this assignment will not be accepted.**