



Lab Session 7

We are monitoring the electric energy generated and consumed in a country with these features:

There are electricity producers that are identified by a name. We are interested in their average production, maximum production, and the date when the generator became operational (*fecha de entrada en funcionamiento*). A producer generates electricity from one of these types: hydroelectric, solar, nuclear, and thermal/fuel-coal (*térmica*).

- Information about hydroelectric plants: occupancy, minimum capacity, and number of turbines.
- Information about solar plants: total surface of solar panels, annual average of sunlight hours, and type (photovoltaic, or thermodynamic).
- Information about nuclear plants: number of reactors, volume of plutonium used, and volume of nuclear waste produced.
- Information about thermal plants: number of boilers (*hornos*), volume of coal used, and volume of gasses emitted.

For security reasons, we want to monitor the plutonium provided to a nuclear plant. This involves the quantity of plutonium bought (*compra*) to each of its potential providers (*suministrador*) (name and country), that are delivered by a carrier (*transportista*) (name and license). It is necessary to save the plutonium stock of each plutonium provider and the number of driving hours of each carrier. The same provider can sell plutonium to different nuclear plants, and that each delivery (*porte*) (there is only one delivery per sale) can be done by a different carrier.

The producers deliver the energy to one or more primary/head stations (*estaciones primarias/de cabecera*) daily. Each head station can receive a different daily amount of energy each day from each of the producers. The head stations are identified by their name. Additional data: number of transformers (from high to low voltage) The head station is head (*cabecera*) of one or more distribution networks.

A distribution network is identified by a network number, has a maximum length, and can only have one head station. A network can be co-owned by several electric companies saving the number of share of stock that each company has in each network. Each electric company is identified by a name and it is necessary to save its capital stock.

The surplus energy (*energía sobrante*) in a network can be sent to another network. The total amount of energy exchanged between the networks is recorded.

A network is composed by several lines. Each line is identified by a sequential number within is network, and has a given length. The lines supply the substations. The name and the capacity of each substation is recorded.

A substation is supplied by only one line, and distributes certain amount of energy on a certain date to one or more service zones. Provinces (code and name) are divided into service zones. Each service zone belongs to just one province, but can be supplied by more than one substation.

The average consumption and the number of final consumers for each of these categories is recorded for each zone: home (*particulares*), companies, and institutions.



Bases de Datos / Databases

