

INSTRUCTIONS

Your task for this assignment is to design a conceptual model for a database which can be used to support the activities of a company which collects household waste for Municipal councils (local authorities) in your local area - Clean Up Inc (CUI).

Local authorities have been actively looking for a way to encourage residents to create sustainable households. One area that is being looked at is reducing the amount of waste that is not recycled by charging more for waste which needs to go to landfill. Together with Clean Up Inc, the councils intend to introduce the concept of a Pay-As-You-Dump (PAYD) program. Unlike current household waste collection programs that require residents to pay a flat rate as part of their council rate payment for waste collection, the PAYD program will charge residents based on the type and weight of waste which is collected from their property. To enable this program, the councils have hired Clean Up Inc to introduce sensor-based waste bins to be used by residents. These smart bins will be equipped with RFID embedded hard tags that are able to uniquely identify each bin in the system. Data from these sensors will be collected to determine the charges to be invoiced by the councils to the residents.

For each local authority, the following details are to be recorded, the authority's name (which is unique e.g., Rivendell Shire), the chief executive officer's name (given name and family name), a contact telephone number and the authorities total area in square kilometers. The type of authority is also recorded. Each authority has responsibilities for the streets in their local authority area. Each street is assigned a unique street id (within the local authority only) and must have recorded the street name, length in meters, type of road surface and number of lanes.

Properties are located on streets. A property is assigned a street number. Each property has recorded the owners' contact details: name, email address and phone number. Each owner is assigned a unique owner id. A property may have several owners.

Clean Up Inc offers local authorities a range of wheelie bins for collecting different types of waste such as green waste, landfill, recycle, etc. Each type of waste is identified by a waste type id, the waste type id and waste type description are recorded in the system. Each type of bin also comes in a range of sizes - for example, the green bin can be supplied as a 75 litre, or a 100 litre or a 240 litre bin. Each bin type and size is assigned a standard bin supply cost, for example a 240 litre green waste bin currently has a standard cost of \$59, a 240 litre landfill bin a standard supply cost of \$62.

For each property, the system records when wheelie bins, of each type, are supplied. This data will help track misuse/theft of bins. Individual bins are not added into the system until they are to be assigned to a property. When a particular bin of a particular type is supplied to a property its RFID tag and the supply date are recorded. If this bin is a replacement for another bin which has been damaged or lost the reason for the replacement is also recorded.

Local authorities sign a contract to cover their household waste collection needs. Each contract is assigned a unique contract number, the start date and end date of the contract are recorded. Each contract sets a collection cost per kilogram for the waste types to be collected by this contract, this collection cost varies with each type of waste to be collected and with each contract. A contract must cover at least one type of waste but may cover many. The contract also specifies the supply cost of the various bin types required; these costs will be different to the standard bin supply costs.

The details of waste collection/pickup will be determined via subsequent interview/discussion with the parties involved as part of assignment 1B.