Task 2 (7 marks)
Conceptual modelling of a data warehouse

An objective of this task is to create a conceptual schema of a sample data warehouse domain described below. Read and analyse the following specification of a data warehouse domain.

A large network of vehicle repair/maintenance facilities would like to create a data warehouse to store information about the facilities located in the different cities, the vehicles maintained at the facilities, and the employees working at the facilities. It is expected that the following information will be stored in the data warehouse.

A vehicle repair/maintenance facility is described by its location (country, city, building number), email address and phone number.

The owners bring their vehicle to the facilities for repairs and/or maintenances. An owner is described by a full name and a unique phone number. A facility keeps the dates when a vehicle was brought for repairs/maintenances and when it was collected by an owner.

A vehicle repair/maintenance facility has a number of employees. An employee is either a mechanic or an admin person. An employee has a unique employee number, first name, last name, and date of birth. The repairs/maintenances are performed by the mechanics. An Implementation of each repair/maintenance requires an involvement of one mechanic. A time spent by a mechanic on a repair/maintenance and all spare parts used are recorded for each repair/maintenance.

The data warehouse must contain information about the total number days spent on repair /maintenance of each vehicle and the total amount of money paid by an owner of a vehicle for repair/maintenance.

A vehicle is described by a registration number, manufacturer, model, and a year when it was manufactured. The owners use credit cards to pay for repairs/maintenances. A credit card number and a name of bank that issued a card is recorded in a database.

A data warehouse must be designed such it should be possible to easily implement the following classes of applications.

A management of the vehicle repair/maintenance facilities would like to get from a data warehouse information about
- *the total number of repairs/maintenances per facility, per year, per month per day, per city and per mechanic,*
- *total costs of repairs/maintenance per facility, per year, per month per day, per city and per mechanic,*
- *total number of mechanics involved per repair/maintenance, per year, per month per day, per facility, per city,*
- *average time spend on repairs/maintenances per year, month, day,*
- *total number of parts used for repars/maintenances per year, month, day, per facility, per city.*

To draw a conceptual schema, use a graphical notation explained to you in a presentation 11 Conceptual Data Warehouse Design.

To create a conceptual schema of a sample data warehouse domain, follow the steps listed below.

Step 1 Find a fact entity, find the measures describing a fact entity.
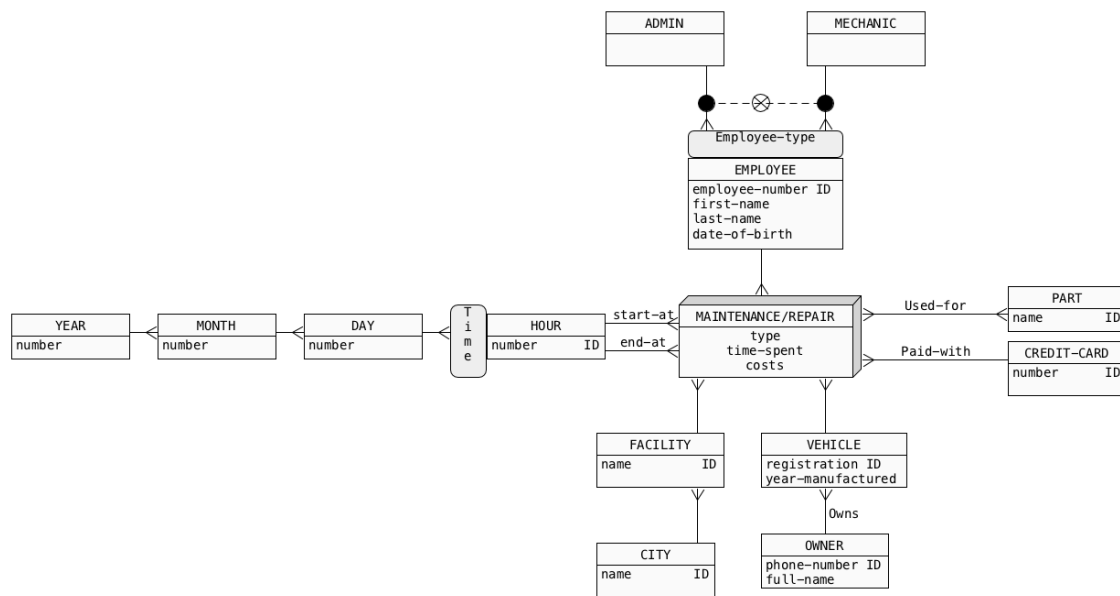Step 2 Find the dimensions.
Step 3 Find the hierarchies over the dimensions.
Step 4 Find the descriptions (attributes) of all entity types.
Step 5 Draw a conceptual schema.

To draw a conceptual schema, you must use a graphical notation explained to you in a presentation 11 Conceptual Data Warehouse Design.

To draw your diagram, you can use UMLet diagram drawing tool and apply a "Conceptual modelling" notation, Selection of a drawing notation is available in the right upper corner of the main menu of UMLet diagram drawing tool. UMLet 14.3 software is can be downloaded from the subject's Moodle Web site in a section WEB LINKS. A neat hand drawing is still all right.