# Assignment II
# Design Decisions

## Entities

1. Customer
    - Attributes:
    - Username (identifier)
    - Name
    - Surname
    - Email
    - Phone
    - Country
    - City

    Relations:
    - Location
        - ***1 -> 1:*** One Customer can have the one Location, one Location can have only one Customer.
    - Car Order
        - ***1 -> N:*** One Customer can have multiple Car Orders, but one Car Order can have only one Customer.

2. Location

    Attributes:
    - Latitude
    - Longitude

    Relations:
    - Customer
    - Car
    - Car Order (From and To)
    - Workshop
        - For further explanations see information about corresponding Entities

    Description:
    - We decided to move GPS coordinates to Location entity, which contains attributes of latitude and longitude. This is also a weak entity, because it depends on corresponding parent entity.

3. Car Order

Attributes:

- Order ID
- Price

Relations:

- Customer
  - ***1 -> N:*** One Customer can have multiple Car Orders, but one Car Order can have only one Customer.
- Car
  - ***1 -> N:*** One Car Order can have only one Car, but Car can be involved in many Orders*.
    *Of course, not in real time. It's about history of Car Orders

4. Car

Attributes:

- Registration ID (Unique)
- Brand
- Model
- Type
- Price per Minute
- Color
- Charge Level
- Availability
- Mileage. Car has a location (Multiple Cars can have the same location), charges at the Charging Station

Relations:

- Car Order
  - ***1 -> N:*** One Car Order can have only one Car, but Car can be involved in many Orders*.
    - *Of course it's not in real time: Car Orders keeps track of all Car Orders made from the start of the system.
- Charging Station
  - ***1 -> N:*** One Car Station can have multiple Cars, but Car can be charged only at one Car Station.
- Service Order
  - ***1 -> 1***: Only one Service Order can specify only one Car

5. Charging Station

Attributes:

- ID (Unique)

Relations:

- Car
  - ***1 -> N***: Car can charge only at one Station, but there can be multiple Cars at one Station
- Location
  - ***1 -> 1***: There can be only one Station at one Location
- Plug
  - ***1 -> N***: There can be multiple plugs at one Station, but each Plug belongs only to the one certain Station

6. The Plug

Attributes:

- Number
- Time for Charge
- Price

Relations:

- Charging Station
  - ***1 -> N***: There can be multiple plugs at one Station, but each Plug belongs only to the one certain Station
- Type
  - ***1 -> N***: There can be many Plugs of one Type, but the Plug belongs only to the one certain type

7. The Type

Attributes:

- ID (Unique)
- Shape
- Size

Relations:

- Plug
  - ***1 -> N***: There can be many Plugs of one Type, but the Plug belongs only to the one certain type

8. Workshop:

Attributes:

- ID (Unique)

Relations:

- Timetable
  - ***1 -> 1***: There is only one Timetable for each Workshop
- Car Part
  - ***1 -> N***: There can be many Car Parts in one Workshop, but each Car Part belongs only to the one certain Workshop
- Location
  - ***1 -> 1***: There can be only one Workshop at each Location

9. Car Part:

Attributes:

- Catalog ID (Unique)
- Type

Relations:

- Car
  - ***N -> N:*** One Car can have many Car Parts, one Car Part can have many Cars which it can be fitted in.
- Parts Provider
  - ***N -> N***: Many Part Providers can provide many Car Parts
- Workshop
  - ***1 -> N***: There can be many Car Parts in one Workshop, but each Car Part belongs only to the one certain Workshop
- Service Order
  - ***N -> N***: Many Service Orders can specify many different Car Parts

10. Parts Provider:

Attributes:

- Company ID (Unique)
- Name
- Address
- Phone

Relations:

- Car Part
  - ***N -> N***: Many Part Providers can provide many Car Parts
- Service Order
  - ***N -> N***: One Service Order can have many Providers, many Service Orders may be involved in many Service Orders

11. Timetable:
    Attributes:
    - Start Time
    - End Time

    Relations:
    - Workshop
        - ***1 -> 1***: There is only one Timetable for each Workshop
    - Service Order
        - ***1 -> N***: Only one certain Service Order can set Timetable, but many different Timetables can be set by one Service Order

12. Manager:
    Attributes:
    - Manager ID (Unique)
    - Name
    - Phone

    Relations:
    - Service Order
        - ***1 -> N***: Manager can place many Service Orders, but every Service Order can be placed by only one certain Manager

13. Service Order:
    Attributes:
    - ID (Unique)
    - Price

    Relations:
    - Manager
        - ***1 -> N***: Manager can place many Service Orders, but every Service Order can be placed by only one certain Manager
    - Car
        - ***1 -> 1***: Only one Service Order can specify only one Car
    - Parts Provider
        - ***1 -> N***: One Provider can provide parts for one Service Order, but Provider may provide parts to many different Service Orders
    - Car Part
        - ***N -> N***: Many Service Orders can specify many different Car Parts
    - Timetable
        - ***1 -> N***: Service Order can be set in only one timetable, but Timetable can have many Service Orders

Decision Statements:

- Service Order - order which is placed by Manager, when Car is broken. It shows which Car  to repair, where to fix (Workshop) and where to buy parts, if needed (Provider).
- Each Workshop has Timetable. Workshop works according planned activities in Timetable. Timetable contains Service Orders, start time and end time.
- Manager checks Cars and creates Service orders if necessary.
- Location is a separate entity, which contains latitude and longitude. There will be separate table which connect Location and Customer; Location and Car and so on. We didn’t find information about ability to make many parents from weak entity, so we’ve drawn it this way.