CE1

Tuesday, October 1, 2024 6:06 PM

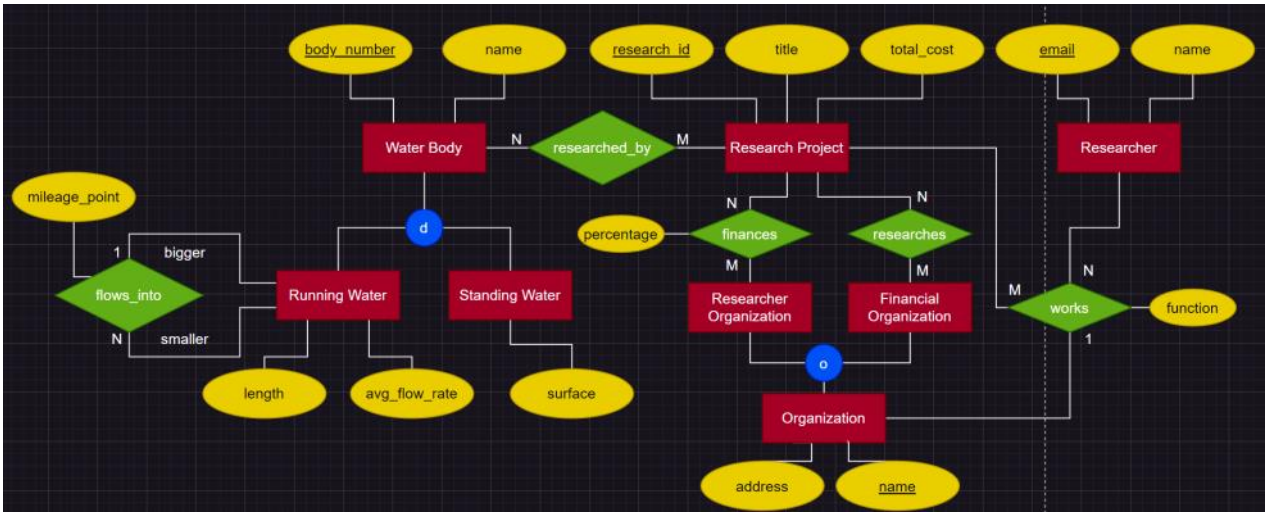
ER model: Research Projects on Water Bodies in Georgia (past exam task)

A research database on the protection of bodies of waters (rivers, streams, lakes) is to be set up in Georgia to monitor water quantity and quality and other water criteria. The following requirements apply to the database:

- The database stores the water bodies with a number and the name of the water body. A distinction is made between running waters (rivers, streams) and standing waters (lakes).
- For running waters, the length and average flow rate (meter per second) are stored. For running waters, it is also stored which (smaller) streams / rivers flow into (larger) rivers and at what mileage point of the larger river this happens.
- For standing waters, the surface is stored.
- The database stores the research projects on the water bodies (ID, title and total cost). Projects can relate to multiple bodies of water and a body of water can be research object in multiple projects.

- The database keeps track of the organizations that are involved in the research projects. The name and address of each organization is stored. Organizations can be involved in two ways:
  1. Organizations can (partly) finance one or more projects. For each funding involvement, the database keeps track of the percentage of the contribution to cover the total cost.
  2. Organizations can provide researcher(s) for one or more projects.
- The two types of involvement (financial or with researcher(s)) are independent of each other. Organizations can only finance or only provide researcher(s) or do both for one or multiple projects.
- Researchers are stored in the database with their name and email. The database keeps track to what organization a researcher belongs. A researcher belongs to only one organization. For all researchers, the database also stores which project or projects they work on and in which function.

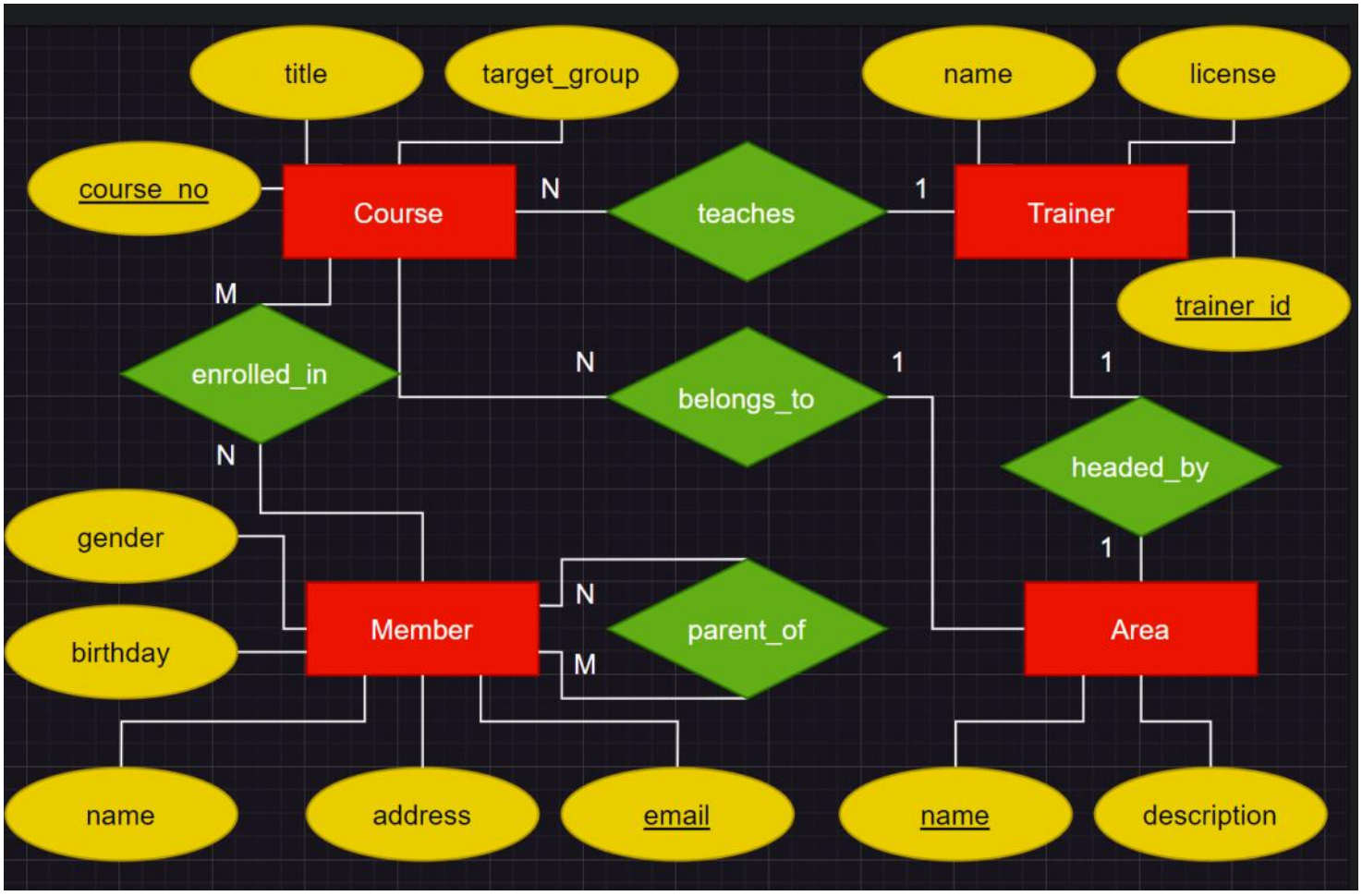
Create the EER model. Underline the PKs. Write down standard cardinalities for all relationships.



- SportsClub

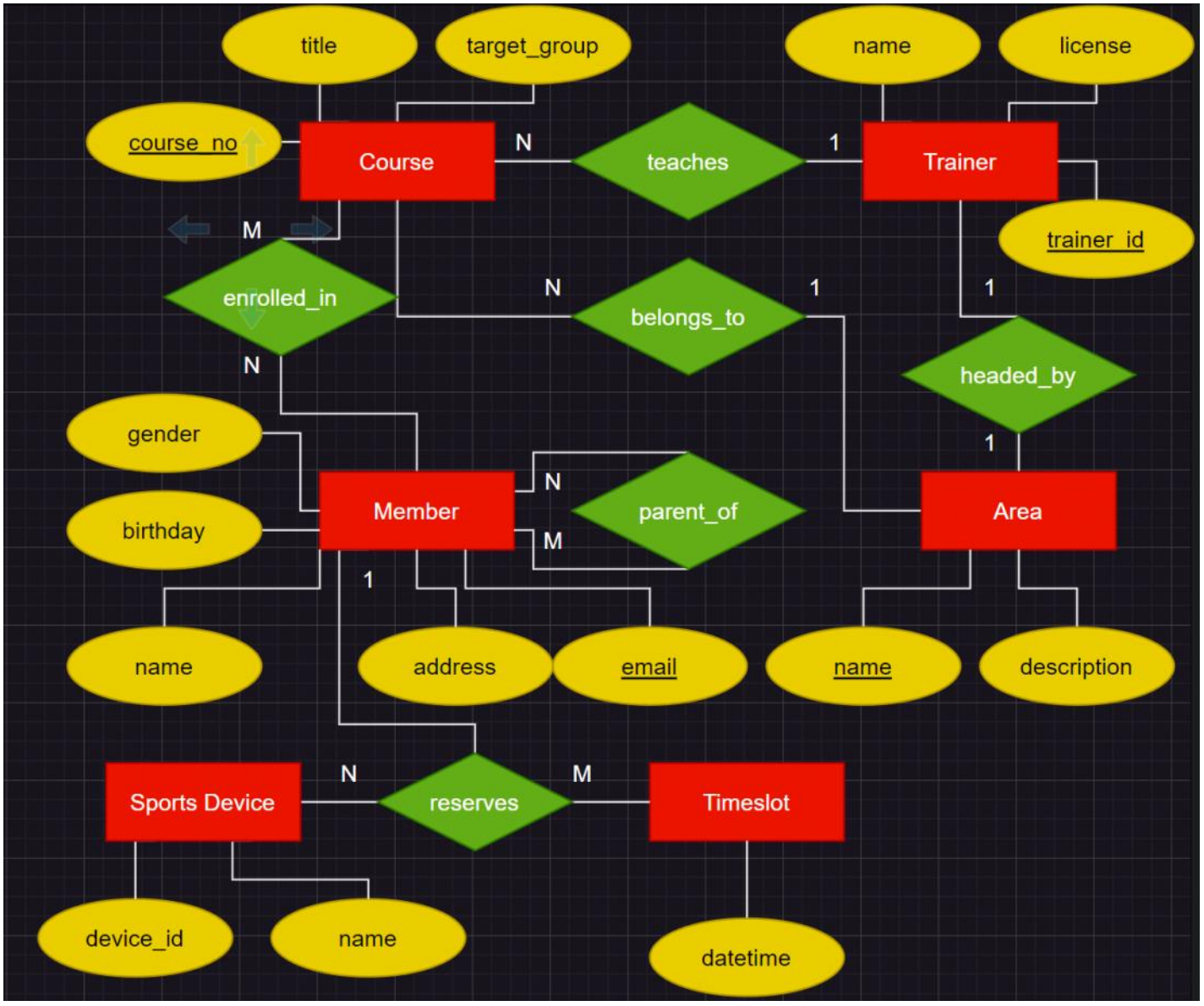
The SportsClub „Fit in Kutaisi“ needs a database for the administration of the club and its data. Develop the ER-model with yEd (or any other graphical editor). Mark primary keys (PKs), add cardinalities and if necessary roles.

1. The database keeps track of the members of the club. For each member it stores: name, address, email, gender and DoB.
2. Minors are only allowed as members if at least one parent is also a member. The database keeps track of who is the parent of a minor member.
3. The club offers sports courses. The database keeps track of all courses. The courses are stored with course number, title and target group (e.g. children, juniors, seniors, ..)
4. Each course is taught by a trainer. The database keeps track of the trainer name, whether the trainer has a trainer‘s licence and, of course, all courses that the trainer teaches.
5. The club offers courses in three areas: fitness, wrestling and athletics. The database keeps track of the name of the area and includes a description. All courses belong to exactly one of the areas. Each area is headed by one trainer. The database keeps track which trainer heads which area. One trainer can only head one area.
6. Members can enroll in courses. One member is, of course, allowed to enroll in many courses. Members do not have to enroll in courses.



Additions / changes to the SportsClub ER model:

- Add the functionality that the database also stores information about the sports devices in the club, with sports device ID and device name.
- Add the functionality that members can reserve sports devices for certain timeslots. Add cardinalities.


title
target_group
name
license
course_no
Course
N
teaches
1
Trainer
trainer_id
M
enrolled_in
N
belongs_to
1
1
N
headed_by
gender
1
N
Member
parent_of
Area
birthday
M
1
name
address
email
name
description
Sports Device
N
reserves
M
Timeslot
device_id
name
datetime