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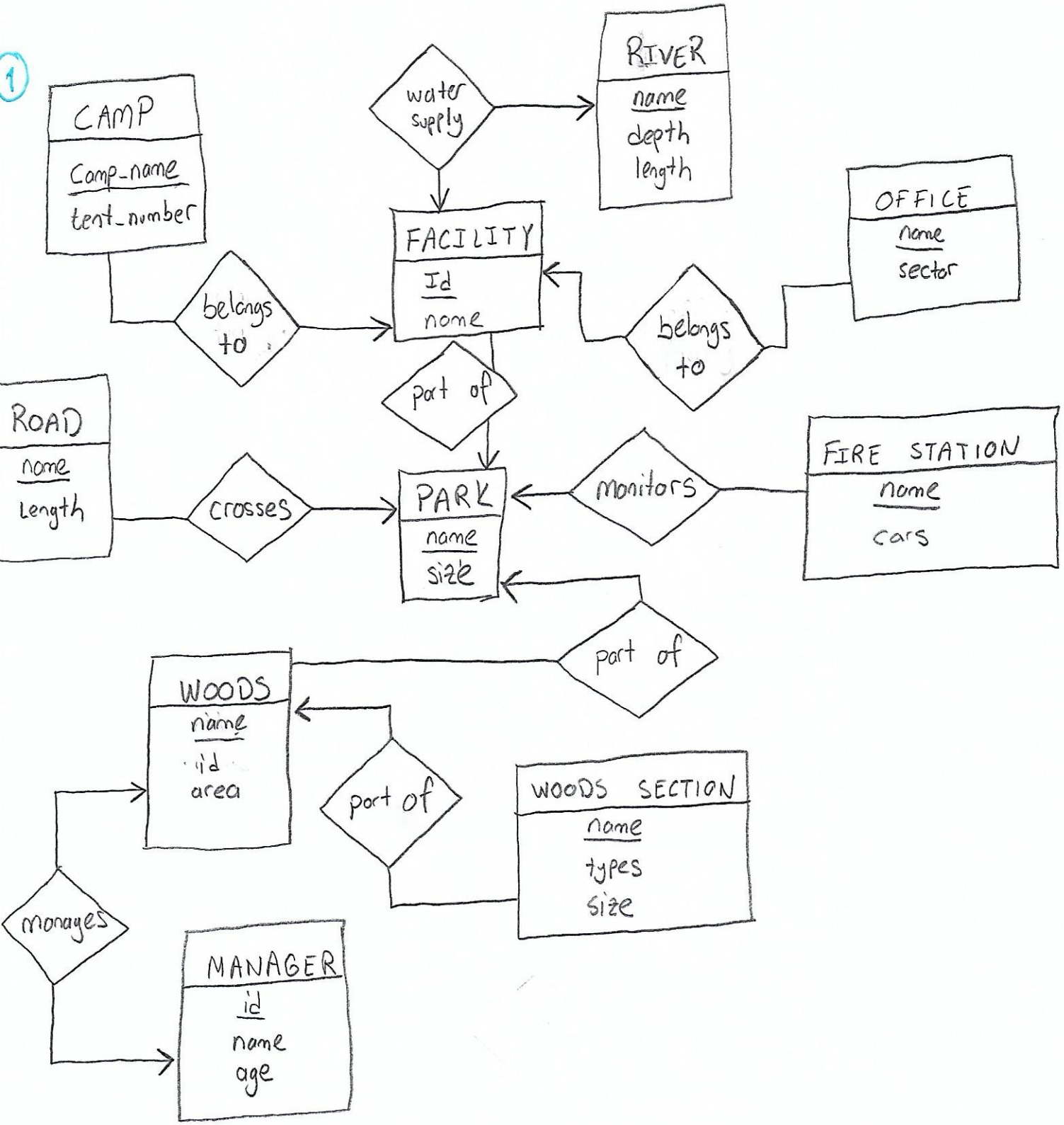
CSE 414 - DATABASE
HW - 01

1



(2)

* Camp (camp_name, tent_number)
  → camp_name → tent_number

* River (name, depth, length)
  → name → depth, length

* Office (name, sector)
  → name → sector

* Facility (id, name)
  → id → name

* Woods Section (name, types, size)
  → name → types, size
  → types → size

* Road (name, length)
  → name → length

* Fire Station (name, cars)
  → name → cars

* Park (name, size)
  → name → size

* Woods (name, id, area)
  → name → id, area
  → id → area

* Manager (id, name, age)
  → id → name, age

(3)

a) In BCNF, database must be 3NF and each determinant column must also be a candidate key.

A relation contains only one primary key and candidate keys must be unique.

In BCNF form, $\alpha \rightarrow \beta$, $\alpha \subseteq R$ and $\beta \subseteq R$

$\alpha \rightarrow \beta$ trivial and α is a super key.

① Road (name, length) : name → length holds on Roads and name is a super key. So, it in BCNF.

② River (name, depth, length) : name → depth, length holds on River and name is a super key. So, it in BCNF.

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b) In my scnerio;

① Woods (id, nome, area)

* id → nome, area
* nome → area

nome is not superkey. So that it is not in BCNF.

② Woods Section (name, types, size)

* nome → types, size
* types → size

type is not superkey. So that it is not in BCNF.

(4) For a database to be 3NF, it must meet following characteristics:

* The database must be 2NF,
* No non-key column should be relative to another (non-key column) or have a transitional functional dependency. In other words, each column must be fully dependent on the unique key.

* The database is suitable for 1NF form: There are no repeating columns in the same table. There is only one value in each column.

* The database is suitable for 2NF fom; it is suitable for 1NF. There is no partial dependency between non-key values and composite keys. Relations are associated with foreign key. No subset of data is repeated in multiple rows.

* I will now give two examples of how I corrected the errors that occurred while designing this system.

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a)

① After : facility (id, name)
Camp (name, tent_number)
Office (name, sector)

Before : facility_camp (facility_id , facility_name , tent_number)
facility_office (facility_id, facility_name, sector)

→ Camp and office entity set are created seperately from facility entity set and suitable to 3NF.

② Park (name, size)

→ name is a superkey and there is functional dependency size to name (name → park_size) and there is no partially dependency. So that this is in 3NF.

b) There is no relationship that does not fit in the 3NF form. Since the database obeys the 3NF rules, there is no problem that any link will not in the 3NF case.

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