

Assignment 3 - Group 29

COMP353 – Databases

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**Question 6.**

1. All applicable FDs

* area -> house
  + an area contains many houses, so those houses’ locations depend on the area
* area -> head
  + every area has a head keeper, so the keeper depends on the area
* house -> kind
  + the kind of animal being kept depends on the house (one kind per house)
* house -> keeper
  + every house has a keeper, so the keeper depends on the house
* kind, inventory# -> cage
  + every animal with a number (e.g. tiger #5) has a unique cage, so the cage depends on the animal and its inventory#

1. You would end up with a lot of transitive dependencies in the table, because cage depends on kind & inventory#, keeper and kind both depend on house, and house and head both depend on area. If one of these values were to change in the table, then the other values depending on it would become incorrect. This could be solved by storing the data in multiple tables that would each refer to one another and avoid all transitive dependencies and the problems that come along with them.
2. “cage” is a candidate key because every cage has a unique animal record, other values in the relation zoo in b) will have repeated, non-unique values for other variables; only “cage” is unique.
3. R {zoo -> area,

area -> head, house

house -> keeper, kind

kind-> cage, inventory#}

1. Yes it is BCNF, as in each relation scheme the LHS is a potential superkey.

**Question 7.**

The answer **b) {ABC, ACDE, ADG}** is a lossless-join, but *not dependency preserving*.