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CS443

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Lab 3

**1) Based on the above assumption, what do you choose to be the primary key of person table? Why?**

* I choose *PerSSN* to be the primary key of the Person table, because every person in the world has a unique social security number that identifies who they are. Furthermore, the purpose of the person table is to create records of people, so it makes sense to use *PerSSN* as the primary key.

**2) Explain the anomalies exist in the person table. Choose only one example of insert anomaly, one example of delete anomaly and one example of update anomaly.**

* **Insertion:** If you wanted to add a record of a new location to the database, a person must first be assigned to it assuming *PerSSN* is the primary key.
  + *For example*: Let's say I want to add information about “Pyongyang, North Korea” to the database. I will also need to have information about a person from “Pyongyang, North Korea” because the primary key is *PerSSN* and it cannot be NULL.
* **Deletion:** If you wanted to delete a person who is the only resident of a particular country, state, city and street, the information pertaining to that location will be also lost from the database.
  + *For example*: Kevin is the only resident of “San Marcos, California, United States”. If we were to delete the person kevin, the record of “San Marcos, California, United States” and its population and size will be also lost from the database.
* **Update:** If a particular country, state city or street name had been changed to a new name, you would have to make that change in every instance that it occurs in the database.
  + *For example*: The State of California decides to officially change its name to Calivada. In the database, every occurrence of the state name “California”, needs to be updated to the new state name “Calivada”.

**3) Normalize the table.**

The Person table is in second normal form as it does not have partial dependencies, however it is not in third normal form because of transitive dependencies and derived dependencies.

To fix the transitive dependency issue, the person table needs to be split up into four tables.

To fix the derived dependency issue, attributes like StatePop, StateSize, ConPop, ConSize and PerAge need to be removed because they can be derived.

Lastly, we need to make the assumed relationships between the entities and this is the result

* COUNTRY ( ConID, ConName )
* STATE ( StateCode, StateName, StateRgn, ConID )
* CITY ( CtyCode, CtyName, CtySize, StateCode )
* PERSON ( PerSSN, PerName, PerDofB, PerAdd, CtyCode )

**4) Draw your ERD based on fully normalized table (Reverse Engineering).**

