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CS 4420-001

Homework 2

1)
   a. This table is in 1NF, the partial dependencies of B -> C, D and A -> E prevent it from being in 3NF
   b. (A, B, F)
      (B, C, D)
      (A, E)
      i. The elements that depend on an element that isn't the primary key get removed and placed into a new table and the element that it depends on stays in the original table as a primary key

2)
   a. This table is in 2NF, the transitive dependencies of B -> C and D -> E prevent it from being in 3NF
   b. (A, B, D)
      (B, C)
      (D, E)
      i. Same process as above

3)
   a. This table is in 3NF, while it may not have any other dependencies listed there are several repeating B and C groups
   b. (E, C, D)
      i. Remove the repeated C and D elements, then make the key a compound key with the repeated group added to the key.

4)
   a. This table is in 2NF, the transitive dependency of SubModel -> Trim prevents it from being in 3NF. There are also several repeating SubModel and Trim groups
   b. (MANU ID, SubModel, VName, Year)
      (SubModel, Trim)
      i. Take out the repeated SubModel and Trim attributes, then take the Trim attribute out of the primary table and put it into a secondary table with SubModel as the key. Also, make both SubModel and Trim keys because they are repeated groups.

5) I believe that the FreeShip column is dependent on the Member column because each Member type has a FreeShip type as opposed to each customer having a different one. I was able to figure this out because the customers who share Member types also share the same FreeShip value. Though it is difficult to make a solid inference based on this small of a dataset I believe that FreeShip depends on Member.

   I believe that the ResidenceType depends on the Address because your address determines what ResidenceType you live in, if your address is an apartment then your ResidenceType will also be an apartment. I was able to figure this out through simple logic knowing that different customers living at the same address can't have a different residence type.