

Individual Exercise 2

- a) Consider the universal relation $R = \{A, B, C, D, E, F, G, H\}$ and the set of functional dependencies $\mathcal{F} = \{\{A, B\} \rightarrow \{C\}, \{A\} \rightarrow \{D\}, \{E\} \rightarrow \{F\}, \{D\} \rightarrow \{G, H\}\}$.
- 1) What is the key for R ?
 - 2) If R is not in 2NF, first decompose it into 2NF and then 3NF relations; if R is in 2NF but not in 3NF, decompose it into 3NF relations; otherwise, do nothing.
- b) Design a proper DTD for the FitnessCenter XML document.
- c) For the following queries on the XML document below for FitnessCenter, write the corresponding XPath expressions.
- 1) Find the home phone number of Jeff.
 - 2) Find the id of all members at the platinum level.
 - 3) When pointing to the level attribute of "David", find the level attribute of the member next to "David".

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<?xml version="1.0"?>
<FitnessCenter>
  <Member id="1" level="gold">
    <Name>Jeff</Name>
    <Phone type="home">555-1234</Phone>
    <Phone type="work">555-4321</Phone>
    <FavoriteColor>lightgrey</FavoriteColor>
  </Member>
  <Member id="2" level="gold">
    <Name>David</Name>
    <Phone type="home">383-1234</Phone>
    <Phone type="work">383-4321</Phone>
    <FavoriteColor>lightblue</FavoriteColor>
  </Member>
  <Member id="3" level="platinum">
    <Name>Roger</Name>
    <Phone type="home">888-1234</Phone>
    <Phone type="work">888-4321</Phone>
    <FavoriteColor>lightyellow</FavoriteColor>
  </Member>
</FitnessCenter>
```

Submission Requirements

You are asked to submit a single pdf file with the name IndTut2.pdf to canvas. Please include your student information in the submitted file.