Assignment 2

Deadline:16.05.2021

In this assignment you have to use the techniques mentioned in our lecture and slides. Any other technique will not be graded. You have to write down the answers to a paper and upload the photo of the paper to moodle.

1- Given R = {A1,A2,A3,A4,A5,A6,A7,A8} and

F = {$A_1A_3 \rightarrow A_7$,

$A_4 \rightarrow A_5A_7$,

$A_2A_3 \rightarrow A_4$,

$A_3A_7 \rightarrow A_2A_4$,

$A_1A_3A_4 \rightarrow A_2$,

$A_3A_5 \rightarrow A_1A_7$}.

After finding extraneous attributes and eliminating them and all redundant FDs, Find the canonical cover of F. You have to define all the steps to get the canonical cover. Just writing the canonical cover without the steps will not be graded.

2-a-Given R(A1,A2,A3,A4,A5,A6) and

A1, A2 → A3

A1, A4 → A5

A2 → A4

A1, A6 → A2

Find the $\{A1,A2\}^+$ and $\{A1,A6\}^+$

b-Why do we need closure? Explain giving examples if necessary.

3-Given R(A_1, A_2, A_3, A_4) under F = {$A_1 \rightarrow A_2$, $A_2 \rightarrow A_3$}. A1 and A2 are superkeys.

a-Is R in BCNF? Give the proof.

b-Suppose that we decomposed R into R1(A1A2), R2(A1A3), and R3(A1A4). Are each of the relations in BCNF? Five the proof.

c- Is the decomposion dependency preserving? Give the proof.