

New submission for: Lecture 5 Exercise

Due: 09/16/2020 @ 04:20 PM EDT

You are given a relation  $R(A,B,C,D,E,F,G)$  with set of fds  $F=\{AB \rightarrow CD, BC \rightarrow EF, AD \rightarrow G\}$ . Check all the options below that are correct.

- ☐ Projection of  $F$  into  $R_x(A,B,D,F,G)$  is  $F_x=\{AB \rightarrow DG\}$
- ☐ Projection of  $F$  into  $R_x(B,C,E,G)$  is  $F_x=\{BC \rightarrow EG\}$
- ☐ Projection of  $F$  into  $R_x(A,B,E,G)$  is  $F_x=\{AB \rightarrow E\}$
- ☐ Projection of  $F$  into  $R_x(A,B,C,D,E)$  is  $F_x=\{AB \rightarrow CD, BC \rightarrow EF\}$
- ☐ None of the above
- ☐ Projection of  $F$  into  $R_x(A,B,D,E,G)$  is  $F_x=\{AB \rightarrow D\}$
- ☒ Projection of  $F$  into  $R_x(A,B,C,D)$  is  $F_x=\{AB \rightarrow CD\}$

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Which of the following is a relation in the 3NF decomposition of  $R(A,B,C,D,E,F,G)$  given  $F=\{ADF \rightarrow BC, EC \rightarrow BG, BD \rightarrow C\}$ ? Choose all that apply.

- ☐  $(A,D,E,F,G)$
- ☐  $(A,B,C,D)$
- ☒  $(E,B,C,G)$
- ☐  $(B,D,C)$
- ☐  $(E,B,C,D,G)$
- ☒  $(A,B,C,D,F)$
- ☒  $(A,D,E,F)$
- ☐ None of these choices

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Choose all of the following decompositions that are lossless for the relation  $R(A,B,C,D,E,F)$  and  $F=\{AB \rightarrow CD, BC \rightarrow EF, CF \rightarrow A\}$ .

- ☐ None of these choices
- ☒  $R_1(B,C,D), R_2(B,C,E,F), R_3(A,C,F)$
- ☐  $R_1(A,B,C,D), R_2(C,D,E,F)$
- ☒  $R_1(A,B,C,D), R_2(B,C,E,F)$
- ☐  $R_1(A,B,C,D), R_2(C,E,F), R_3(A,C,F)$
- ☒  $R_1(B,C,D), R_2(B,C,E,F,A)$

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Check all of the following statements that are correct.

- ☐ None of the other options
- ☒ 3NF decompositions are guaranteed to be dependency preserving.
- ☐ Lossless decompositions are guaranteed to be dependency preserving.
- ☒ 3NF decompositions are guaranteed to be lossless.
- ☐ BCNF decompositions are guaranteed to be dependency preserving.
- ☒ BCNF decompositions are guaranteed to be lossless.

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