1. Consider the following relation instance of R(B,C,D,E).

B	C	D	E
8	6	1	7
0	4	1	9
8	6	1	7
8	5	2	7

List all FDs of the form $\alpha \rightarrow \beta$ (where $\alpha \subseteq$ R and $\beta \in$ R) that definitely do not hold on R.

2. Consider a relational schema R and let a, b, c, d ⊆ R. Use Armstrong's Axioms to prove the soundness of the following two inference rules:
   (a) Pseudo Transitivity: If a ⟶ b and bc ⟶ d, then ac ⟶ d
   (b) Composition rule: If a ⟶ b and c ⟶ d, then ac ⟶ bd

3. Consider R(A, B, C, D, E, G) with FDs F = {ABC ⟶ E, BD ⟶ A, CG ⟶ B}.
   (a) Use Armstrong's Axioms to show that F implies CDG ⟶ E
   (b) Compute {CDG}+
   (c) Find all the keys of R

4. Consider the schema R(A,B,C,D,E) with FDs
   F = {AB ⟶ CDE, AC ⟶ BDE, B ⟶ C, C ⟶ B, C ⟶ D, B ⟶ E}.
   Find all the keys of R.