# HW 3 Nawras Rawas Qalaji

1.) (1.) $X \rightarrow Y, Z \rightarrow Y, XZ \rightarrow Y$
   (2.) $X \rightarrow Y, Z \rightarrow Y, XZ \rightarrow Y$


2.) (1.) BCD, ACD
   (2.) No, attribute C and D are not part of some key
   (3.) There are no super keys and the rule $X \in A$ is violated
   (4.) AB ACE ACD


3.) (1.) SELECT *
     FROM R r1, R r2
     WHERE NOT EXISTS r1.A=r2.A and r1.B <> r2.B

   (2.) CREATE ASSERTION enforceDependency
     CHECK SELECT *
            FROM R r1 R r2
            WHERE NOT EXISTS r1.A = r2.A and r1.B <> r2.B
   (3.) SELECT *
     FROM R r1
     WHERE IS NOT NULL (SELECT *
                        FROM R r2
                        WHERE NOT EXISTS r1.A=r2.A and r1.B <> r2.B)

     CREATE ASSERTION enforceDependency
     CHECK SELECT *
     FROM R r1
     WHERE IS NOT NULL (SELECT *
                        FROM R r2
                        WHERE NOT EXISTS r1.A = r2.A and r1.B <> r2.B)


4.) (1a.) BD
   (1b.) Not good, cannot recover original R

   (2a.) AB, CB
   (2b.) Good, can recover the original R

   (3a.) A, C
   (3b.) Not good, cannot recover original R

   (4a.) A
   (4b.) Not good, cannot recover original