## In-class Exercises: Functional Dependencies

Su

1.	What an FD means. Suppose the functional dependency $BC \to D$ holds in $R$ . Create an instance of $R$ that violates
	this FD.
2.	Equivalent sets of FDs.
	(a) Are the sets $A \to BC$ and $A \to B$ , $A \to C$ equivalent? If yes, explain why. If no, construct an instance of $R$ that satisfies one set of FDs but not the other.
	(b) Are the sets $PQ \to R$ and $P \to R, Q \to R$ equivalent? If yes, explain why. If no, construct an instance of $R$ that satisfies one set of FDs but not the other.
	satisfies one set of PDs but not the other.
	(c) Are the sets $PQ \to R$ and $P \to Q, P \to R$ equivalent? If yes, explain why. If no, construct an instance of R that
	satisfies one set of FDs but not the other.

## 3. Keys and FDs.

(a) We claimed that if a set of attributes K functionally determines all attributes, K must be a superkey (i.e., no two tuples can agree on all attributes in K). Do you believe this? Suppose these FDs hold in R:  $A \to BC$ ,  $C \to D$ . Does A functionally determine all attributes of R? Can two tuples agree on A?

