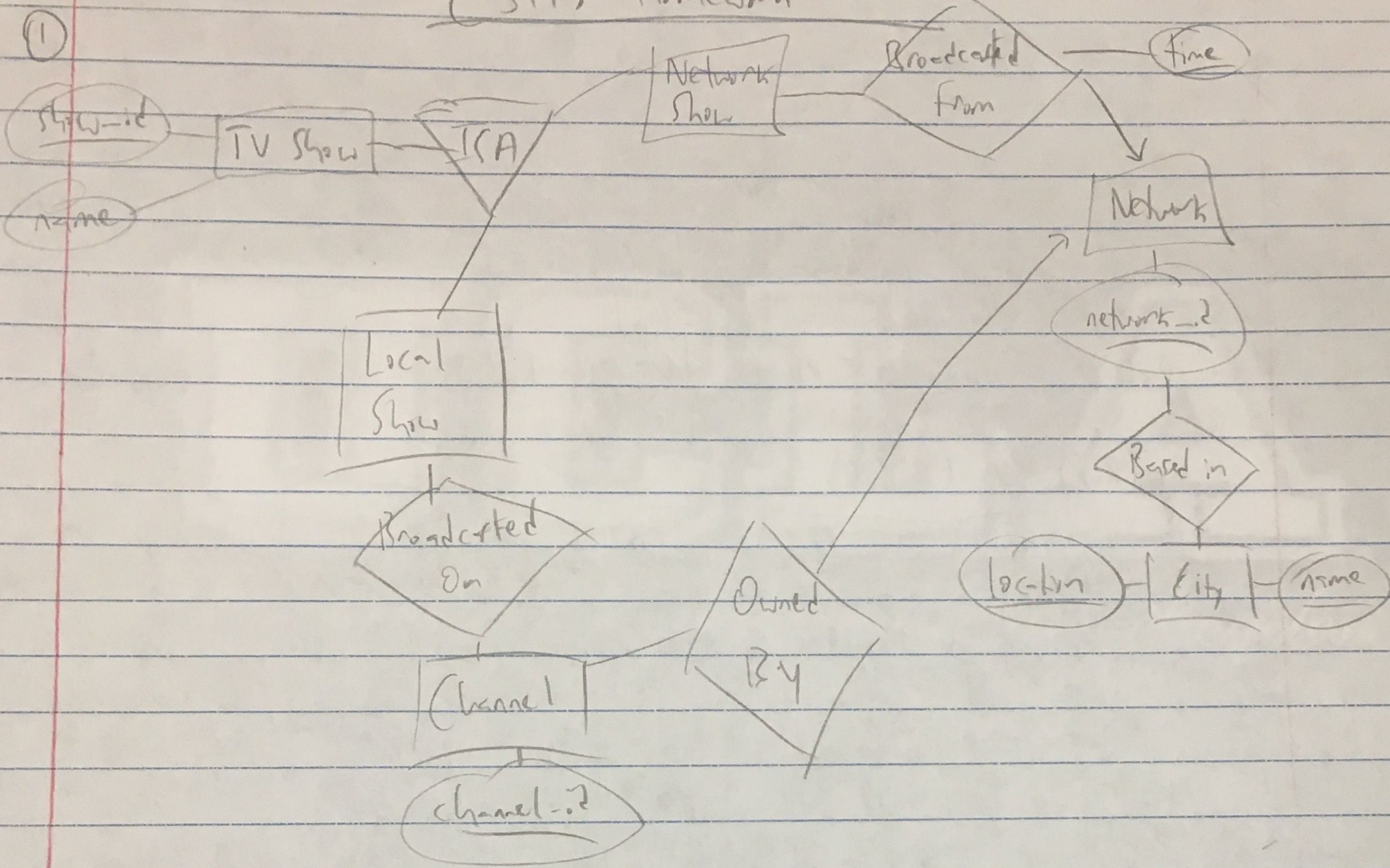


CS143 Homework 4



- ②
- Parts (number)
 - Assembly (number, cert)
 - Composed of (assembly number, part number, quantity)

- ③
- The shared attribute between the decomposed tables of the original is A
 - The decomposition is lossless if A is key of either of the decomposed tables
 - As A is a key for the decomposed table $(A, P, E) \Rightarrow$ lossless

- ④
- A has the least variation among the three
 - B is always constant
 - C has the most variation among the three
 - Therefore, the functional dependencies could perhaps be $A \rightarrow B$ as a varying variable
 - $C \rightarrow A$ chooses a less varying variable

- (5) (a) Yes $\Rightarrow E \rightarrow ABCDE$
 (b) Yes $\Rightarrow BC \rightarrow ABCDE$

- (6) • $A \rightarrow A, B, C, D, E$ [Is missing F, so not a key] \Rightarrow Not in BCNF
 • $R_1(A, B, C, D, E), R_2(A, F)$ [Decompose R_1]
 • $C \rightarrow C, E$ [Missing attribute, so not a key]
 • $R_3(C, E), R_4(A, B, C, D)$ [Decompose R_4]
 • $B \rightarrow B, D$ [Missing attribute, so not a key]
 • $R_5(B, D), R_6(A, B, C)$
 $\hookrightarrow R_2(A, F), R_3(C, E), R_5(B, D), R_6(A, B, C)$