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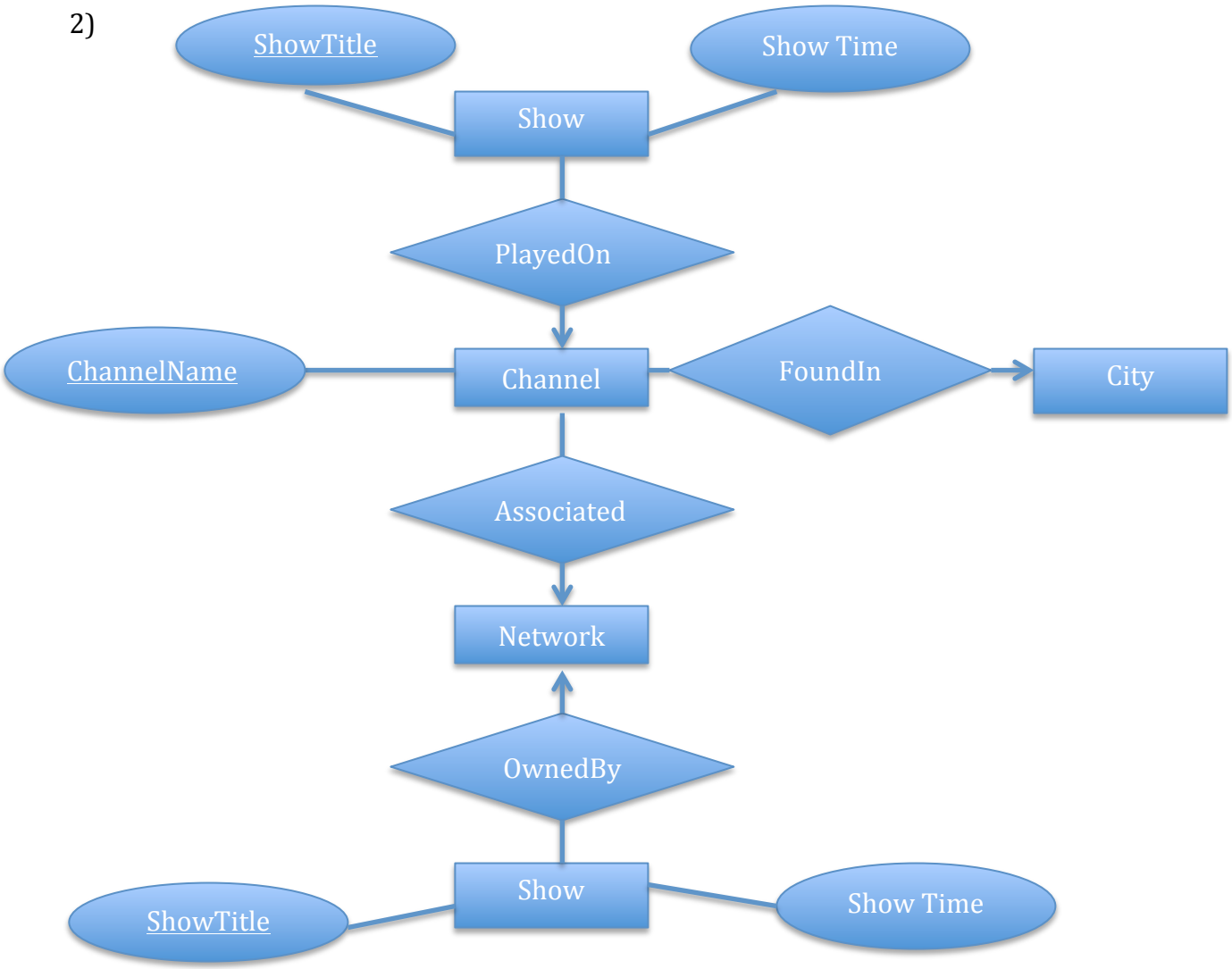
CS143
HW 5

1)
To read all Tuples of R,
750,000/500 = 1,500 blocks
Since for every tuple in R there are roughly 5 tuples in S, to read the tuples in S
750,000*5 = 3,750,000 blocks
Total Block read =
1,500 blocks of R + 3,750,000 blocks of S = 3,751,500 blocks

The new plan requires the same amount of R-block read
However, it requires an extra S-block read for
750,000*5000/100 sequential = 37,500,000 blocks
Total Block read =
37,500,000 + 1,500 = 37,501,500 blocks

The second plan requires 10 times more block access than the first plan. However, if the cost of random access is much more (>10) times than sequential access, the second plan will require less time.

2)



PlayedOn(ShowTitle, Channel)
Associated(ChannelName,Network)
FoundIn(ChannelName, City)
OwnedBy(ShowTitle,Network)

3)
Parts(number)
Assembly(number, cost)
ComposedOf(number,cost,quality)

4)
R1(A,B,C,F) ∩ R2(A,D,E) = A
A->BC->CD->E->A
A->ADE

R1(A,B,C,F) ∩ R2(A,D,E) -> R2(A,D,E)
It is a lossless decomposition

5)
A->B
C->A

This is because B is always constant and C is the most varied.

6)
a) E -> A, A -> BC, -> BC -> CD, CD -> E
{E}+ = {ABCDE}
E is a key
b) BC -> CD, CD -> E, E -> A, A -> BC
{BC}+ = {ABCDE}
BC is a key

7)
NOT BCNF
{A}+ = {BCDE} Not BCNF
{B}+ = {D} Not BCNF
{C}+ = {E} Not BCNF

Normalized

R1(A,B,C)
R2(B,D)
R3(C,E)