資工三 109590004 呂育瑋

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Q1(a).

Consider {A, B, C, D, E, F, G, H, I, J } first

{ A, B } → { C }, remove { C } => { A, B, D, E, F, G, H, I, J }

{ B, D } → { E, F }, remove { E, F } => { A, B, D, G, H, I, J }

{ A, D } → { G, H }, remove { G, H } => { A, B, D, I, J }

{ A } → { I }, remove { I } => { A, B, D, J }

{ H } → { J }, remove { J } => { A, B, D }

Thus, the key of R = { A, B, D }

Q1(b).

R1 = { A, B, C }

R2 = { B, D, E, F }

R3 = { A, D, G, H, J } ( merge { A, D } → { G, H } and { H } → { J } )

R4 = { A, I }

Q1(c).

R1 = { A, B, C }

R2 = { B, D, E, F }

R3-1 = { A, D, G, H }

R3-2 = { H, J }

R4 = { A, I }

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Q2(a).

All attributes depend on nothing but the key, and no transitive dependencies on the primary key (for

nonprime attribute. So it is 3NF.

Q2(b).

{ Course\_no, Sec\_no, Semester, Year } and { Room\_no, Days\_hours, Semester, Year }

Q2(c).

No.

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Q3(a).

( 30 + 9 + 9 + 40 + 10 + 8 + 1 + 4 + 4 ) + 1 = 116 bytes

Q3(b).

Bfr = floor(512/116) = 4 records/block

b = 30000/4 = 7500