A9 GAG1 – Atli Gíslason [atlig17@ru.is](mailto:atlig17@ru.is)

1. C 🡪D, C 🡪 A, B 🡪 C.

a) Identify the candidate keys.

Rewrite the relations: B 🡪 C, C 🡪A, C 🡪 D.

Transitive rule 3: B 🡪C, B🡪A, B 🡪D.

B 🡪 all: A, B, C, D.

B is a key.

b) Identify the best normal form.

R = ABCD

B 🡪 ACD.

R is a BCNF.

c) Decompose to set of BCNF

R is in BCNF form.

2. B 🡪 C, D 🡪 A.

a) Identify the candidate keys.

BD 🡪 A, BD 🡪 C.

BD is a key.

b) Identify the best normal form.

R = BDCA

BD 🡪A, BD 🡪 C.

R is a BCNF.

c) Decompose to set of BCNF

R is in BCNF form.

3. ABC 🡪 D, D 🡪A.

a) Identify the candidate keys.

BC 🡪 A, BC 🡪 D, A 🡪 D, D 🡪A.

BC is a key.

b) Identify the best normal form.

R = BCDA

R is a BCNF, and also 2NF.

c) Decompose to set of BCNF

BC 🡪 A, BC 🡪 D, A 🡪 D, D 🡪 A

=> BC 🡪 A, BC 🡪 D.

4. A 🡪 B, BC 🡪 D, A 🡪 C.

a) Identify the candidate keys.

A 🡪 B, A 🡪 C, BC 🡪 D.

Transitivity: A 🡪 B, A 🡪 C, A 🡪 D, BC 🡪 D.

A is a key.

b) Identify the best normal form.

R = ABCD

R is a BCNF, and also a 2NF.

c) Decompose to set of BCNF

A 🡪 B, A 🡪 C, A 🡪 D.

5. AB 🡪 C, AB 🡪 D, A 🡪 C, C 🡪 A.

a) Identify the candidate keys.

AB is a key.

b) Identify the best normal form.

R = ABCD

R is a 3NF.

c) Decompose to set of BCNF

There is no possible BCNF.