COMP9311 Assignment 2

1. {A}+ = {A,C,D,E,H,G,I} , so A—>I wpsoffice {A}+|F. Therefore, A—>I wpsoffice F+.

2) Superkey = {A,B,C,E,H,J}

If we remove A : {B,C,E,H}+ = {A,B,C,D,E,G,H,I} . So A can be removed.

If we continue to remove B:{C,E,H}+ = {A,C,D,E,G,H,I},so B can’t be removed.

Then we try to remove C,E,H step by step,and finally we find a candidate key {B,E,J}.

3){E}+ = {A,C,D,E,G,H,I} , {B}+ = {B,G,I}, so G and I can be determined by either B or E of the candidate key {B,E,J},so it is not in 2NF.Besides,its attribute values are atomic,so it’s in 1NF.

4) First,we remove the right side.

F’ = {A->D,A->E,B->G,B->I,E->C,E->D,CE->A,CE->D,CE->H,H->D,AH->I}

Second,we remove the left side.

F’’ = {A->D,A->E,B->G,B->I,E->C,E->D,E->A,E->H,H->G,A->I}

Finally,we remove the redundant FDs.

Fm = {A->E,A->I,B->G,B->I,E->C,E->D,E->A,E->H,H->G}.

5) For Fm:

From A->E,A->I,derive R1{A,E,I}

From B->G,B->I,derive R2{B,G,I}

From E->C,E->D,E->A,E->H,derive R3{A,C,D,E,H}

From H->G,derive R4{H,G}

No relation contains a key of J,so we add R5{B,E,J}

2.

1)

B

T1 T2

B

B

B

A

A

A

T3 T4

A

From the graph,we can know there are many cycles,so it’s not conflict serialisable.



T1 T2 T3 T4

|  |  |  |  |
| --- | --- | --- | --- |
| R(B)  R(A)  W(B)  W(A) | R(B)  W(B) | R(A)  W(A) | R(A)  W(A)  R(B)  W(B) |

3)

T1 T2

|  |  |
| --- | --- |
| write\_lock(B)  R(B)  write\_lock(A)  R(A)  write(B)  unlock(B)  write(A)  unlock(A) | write\_lock(B)  R(B)  write(B)  unlock(B) |