**Data Sanitization**

**Problem**: Follow SCIKD sanitization strategy for Table 1 against Chase to prevail unmasking hidden values (marked in red).

a b c d

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x1 | 1 | 1 | 2 | 1 |
| x2 | 3 | 1 | 2 | 2 |
| x3 | 1 | 2 | 2 | 1 |
| x4 | 2 | 1 | 1 | 2 |
| x5 | 3 | 1 | 2 | 2 |
| x6 | 3 | 2 | 1 | 2 |
| x7 | 2 | 2 | 1 | 2 |

Table 1.

**Solution:**

a1\*= {1,3} a2\*={4,7} a3\*={5,6}

b1\*= {1,2,4,5} b2\*={3,6,7}

c1\*= {4,6,7} c2\*={1,2,3,5}

d1\*= {1,3} d2\*={2,4,5,6,7}

d – decision attribute

a1\*={1,3}<d1\* a2\*={4,7}<d2\* a3\*={2,5,6}<d2\*

b1\*={1,2,4,5} b2\*={3,6,7}

c1\*={4,6,7}<d2\* c2\*={1,2,3,5}

b1.c2\*={1,2,5} b2.c2\*={3}<d1\*

d1\*={1,3} d2\*={2,4,5,6,7}

c – decision attribute

a1\*={1,3}<c2\* a2\*={4,7}<c1\* a3\*={2,5,6}

b1\*={1,2,4,5} b2\*={3,6,7}

c1\*={4,6,7} c2\*={1,2,3,5}

d1\*={1,3}<c2\* d2\*={2,4,5,6,7}

a3.b1\*={2,5}<c2\* a3.b2\*={6}<c1\* ~~a3.d2\*=a3\*~~

b1.d2\* = {2,4,5} b2.d2\*={6,7}< c1\*

b – decision attribute

a1\*={1,3} a2\*={4,7} a3\*={2,5,6}

b1\*={1,2,4,5} b2\*={3,6,7}

c1\*={4,6,7} c2\*={1,2,3,5}

d1\*={1,3} d2\*={2,4,5,6,7}

~~a1.c1\*~~ ~~a1.c2\*=a1\*~~ ~~a1.d1\*=a1\*~~ ~~a1.d2\*~~

~~a2.c1\*=a2\*~~ ~~a2.c2\*~~ ~~a2.d1\*~~ ~~a2.d2\*=d2\*~~

a3.c1\* ={6}<b2\* a3.c2\* ={2,5}<b1\* ~~a3.d1~~\* ~~a3.d2\*={a3}~~

~~c1.d1\*~~ ~~c1.d2\*=c1\*~~ ~~c2.d1\* c2.d2\*~~

a-decision attribute

a1\*={1,3} a2\*={4,7} a3\*={2,5,6}

b1\*={1,2,4,5} b2\*={3,6,7}

c1\*={4,6,7} c2\*={1,2,3,5}

d1\*={1,3} <a1\* d2\*={2,4,5,6,7}

b1.c1\* ={4}<a2\* b1.c2\* ={1,2,5} b1.d2\*={2,4,5}

b2.c1\* ={6,7} b2.c2\*={3}<a1\* b2.d2\*={6,7}

~~c1.d2\*=c1\*~~ c2.d2\*={2,5}<a3\*

b1.c2.d2\*= {5}<a3\* ~~b2.c1.d2\* = b2.d2\*~~

KB = {d1 -> a1, b1.c1 -> a2, b2.c2 -> a1, c2.d2 -> a3

b1.c2.d2 -> a3, a3.c1 -> b2, a3.c2 -> b1,

a1 -> c2, a2 -> c1, d1 -> <c2, a3.b1 -> c2, a3.b2 -> c1, b2.d2 -> c1,

a1 -> d1, a2 -> d2, a3 -> d2, c1 -> d2, b2.c2 => d1}

Sanitizing tuple x2: b1 c2 d2 a3 ???

KB = {d1 -> a1, b1.c1 -> a2, b2.c2 -> a1, c2.d2 -> a3

b1.c2.d2 -> a3, a3.c1 -> b2, a3.c2 -> b1,

a1 -> c2, a2 -> c1, d1 -> c2, a3.b1 -> c2, a3.b2 -> c1, b2.d2 -> c1,

a1 -> d1, a2 -> d2, a3 -> d2, c1 -> d2, b2.c2 => d1}

b1\*={b1}

c2\*={c2}

d2\*={d2}

{b1,c2}\*={b1,c2}

{b1.d2}\*={b1,d2}

{c2,d2}\*={c2,d2,a3}

Sanitizing tuple x3: a1 b2 d1 c2???

KB = {d1 -> a1, b1.c1 -> a2, b2.c2 -> a1, c2.d2 -> a3

b1.c2.d2 -> a3, a3.c1 -> b2, a3.c2 -> b1,

a1 -> c2, a2 -> c1, d1 -> c2, a3.b1 -> c2, a3.b2 -> c1, b2.d2 -> c1,

a1 -> d1, a2 -> d2, a3 -> d2, c1 -> d2, b2.c2 => d1}

a1\*={a1,c2,d1}

b2\*={b2}

d1\*={d1,a1c2}

Sanitized table for objects x2, x3

a b c d

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x1 | 1 | 1 | 2 | 1 |
| x2 | 3 | 1 | 2 |  |
| x3 |  | 2 | 2 |  |
| x4 | 2 | 1 | 1 | 2 |
| x5 | 3 | 1 | 2 | 2 |
| x6 | 3 | 2 | 1 | 2 |
| x7 | 2 | 2 | 1 | 2 |

Table 1.