BLP Lattice Structure
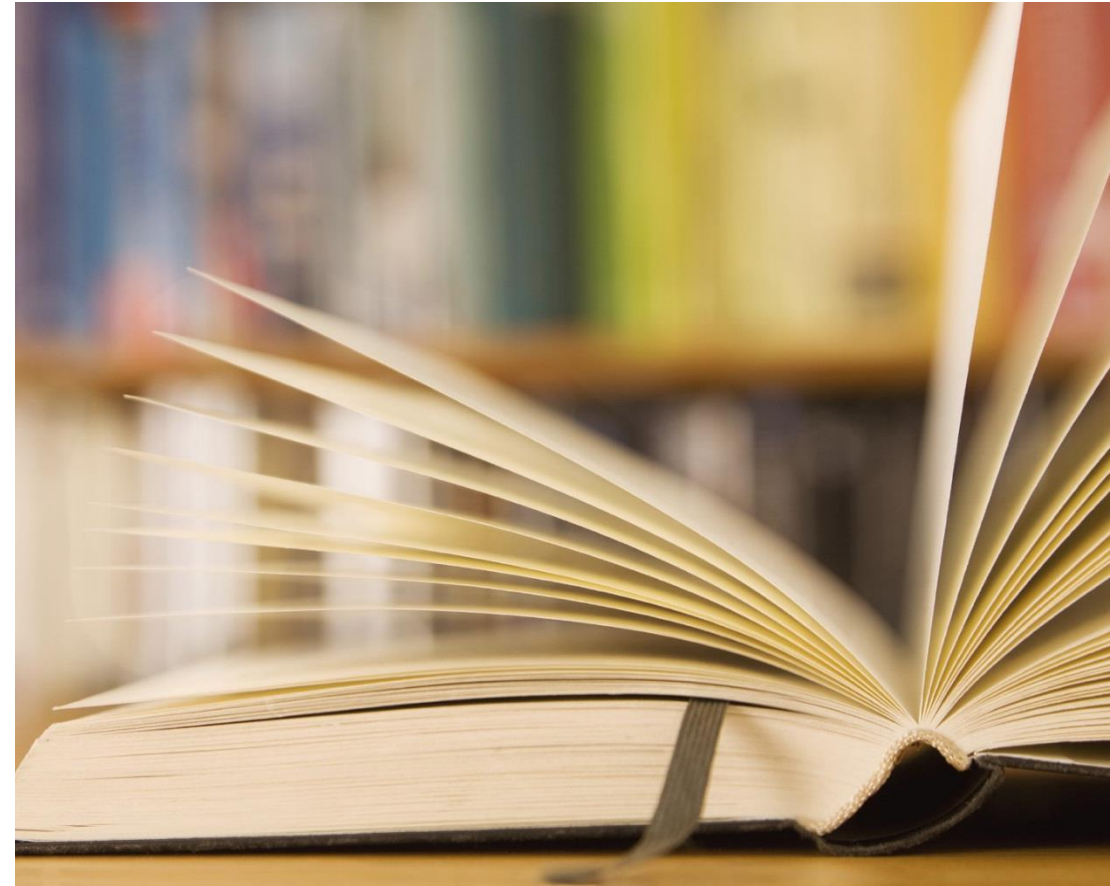
Example

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Given the following access control matrix:

	O1	O2	O3	O4	O5
S1	R	R	RW	R	R
S2	R	R	W	W	W
S3	R	R			
S4	R	R	W	R	
S5	R	R	W		W

Generate a BLP lattice-structured system where the objects and subjects are appropriately levelled to give access consistent with the access control matrix shown.

Given the following access control matrix:

	O1	O2	O3	O4	O5
S1	R	R	RW	R	R
S2	R	R	W	W	W
S3	R	R			
S4	R	R	W	R	
S5	R	R	W		W

O1, O2

Subjects from every level can read objects O1 and O2 -> O1 and O2 are dominated by all subject. Hence O1 and O2 must be at the lowest point.

Given the following access control matrix:

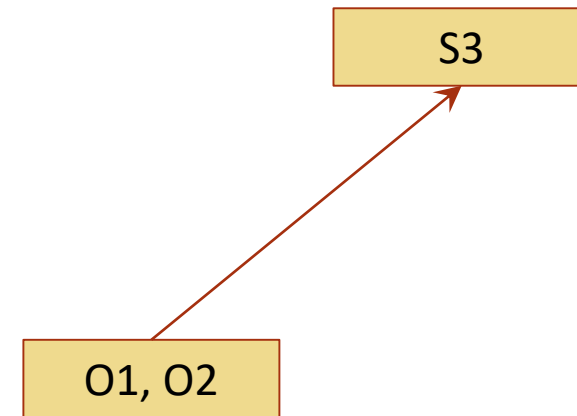|	O1	O2	O3	O4	O5
S1	R	R	RW	R	R
S2	R	R	W	W	W
S3	R	R			
S4	R	R	W	R	
S5	R	R	W		W

S1, O3

O1, O2

Subject S1 and read and write object O3, hence S1 and O3 must be at the same level (can put them together.)

Given the following access control matrix:

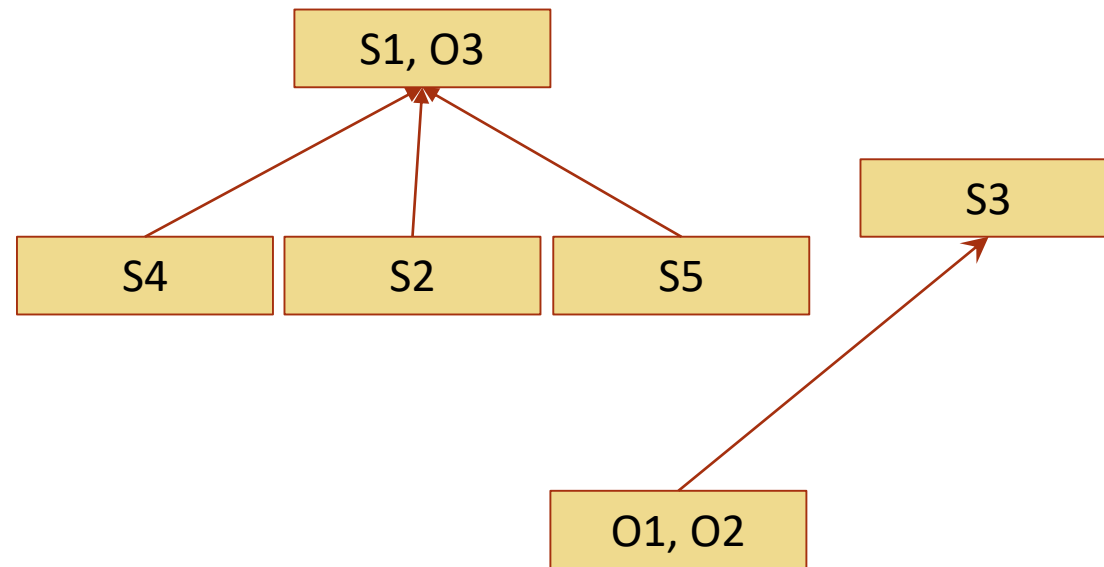|	O1	O2	O3	O4	O5
S1	R	R	RW	R	R
S2	R	R	W	W	W
S3	R	R			
S4	R	R	W	R	
S5	R	R	W		W

S1, O3

S3

O1, O2

Subject S3 can read only objects O1 and O2, hence subject S3 can only dominate object O1 and O2.
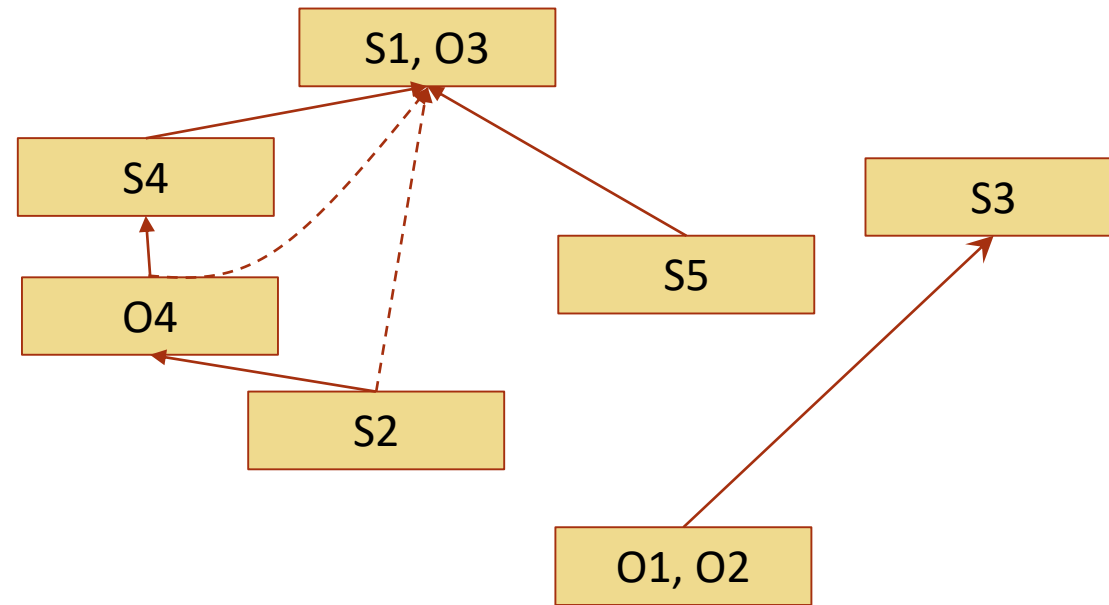
Given the following access control matrix:

	O1	O2	O3	O4	O5
S1	R	R	RW	R	R
S2	R	R	W	W	W
S3	R	R			
S4	R	R	W	R	
S5	R	R	W		W

S1 and O3 must dominate subjects S2, S4 and S5 in order to allow writing.
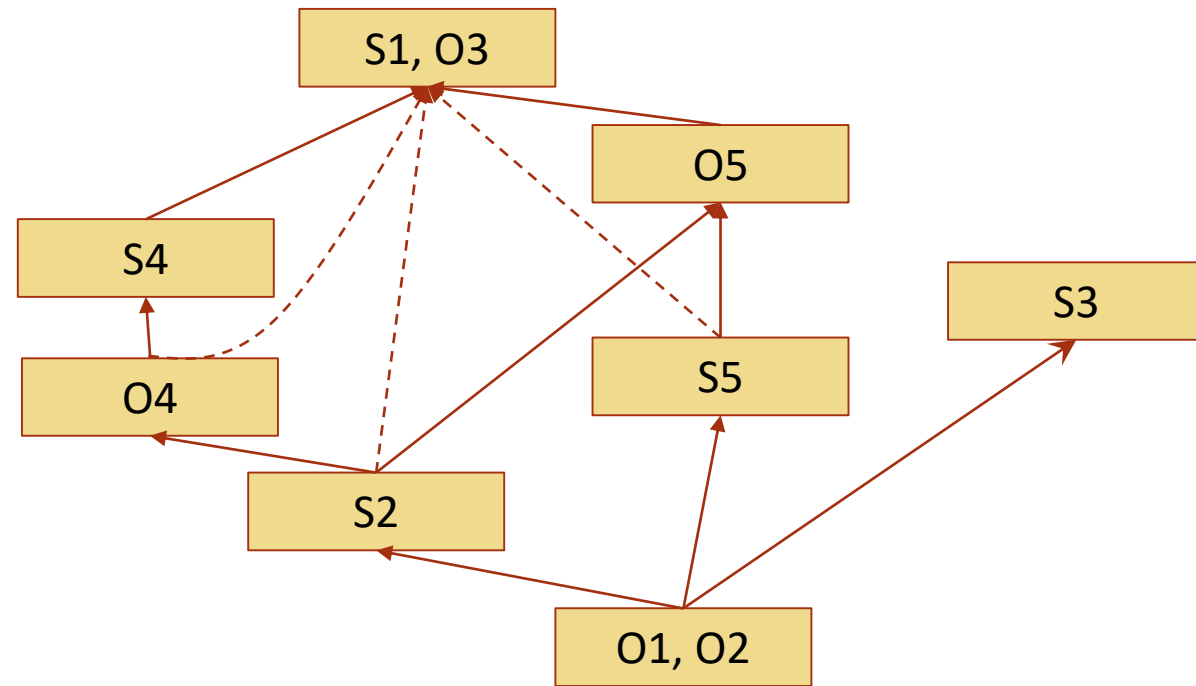
Given the following access control matrix:

	O1	O2	O3	O4	O5
S1	R	R	RW	R	R
S2	R	R	W	W	W
S3	R	R			
S4	R	R	W	R	
S5	R	R	W		W

Subjects S2 and S4 are not at the same level due to the different behaviour with respect to O4.
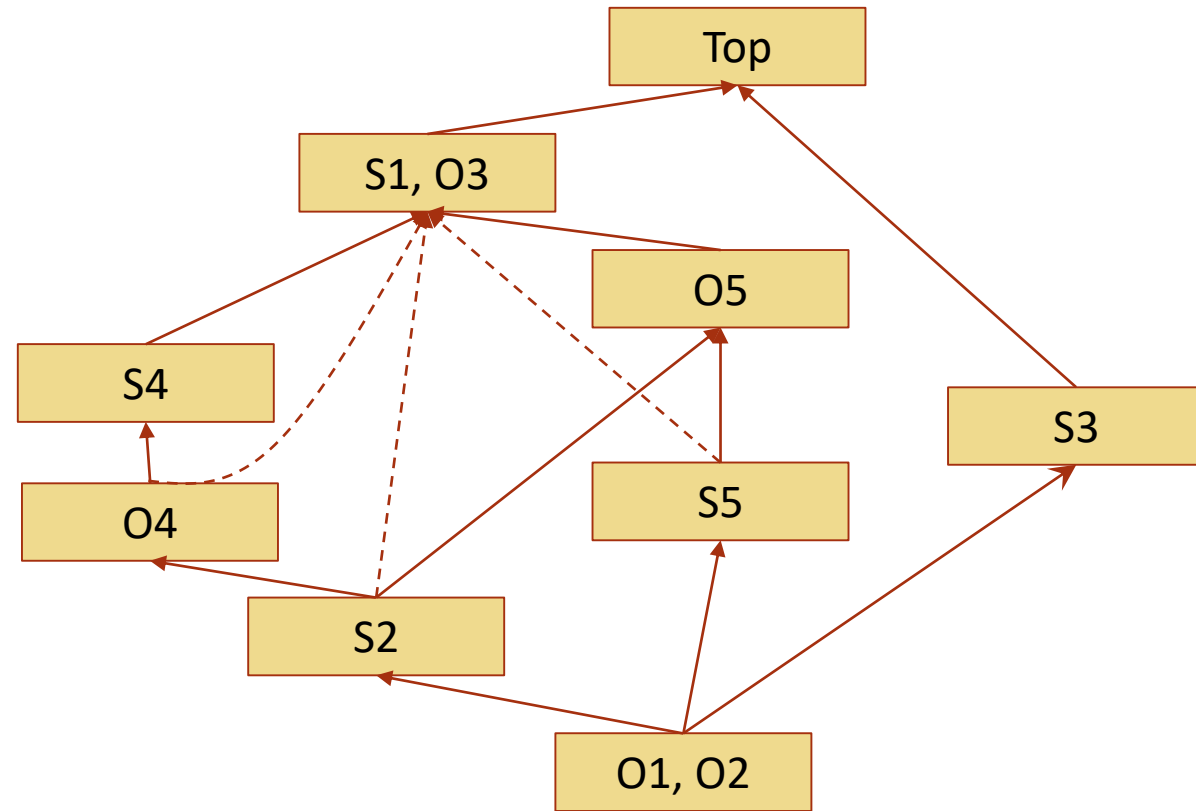
Given the following access control matrix:

	O1	O2	O3	O4	O5
S1	R	R	RW	R	R
S2	R	R	W	W	W
S3	R	R			
S4	R	R	W	R	
S5	R	R	W		W

Complete the other dominance.

Given the following access control matrix:

	O1	O2	O3	O4	O5
S1	R	R	RW	R	R
S2	R	R	W	W	W
S3	R	R			
S4	R	R	W	R	
S5	R	R	W		W

Introduce a top level to complete the lattice.

Given the following access control matrix:

	O1	O2	O3	O4	O5
S1	R	R	RW	R	R
S2	R	R	W	W	W
S3	R	R			
S4	R	R	W	R	
S5	R	R	W		W

Final complete lattice.