

Problem 1.

Prove that Diamond is not a distributive lattice:

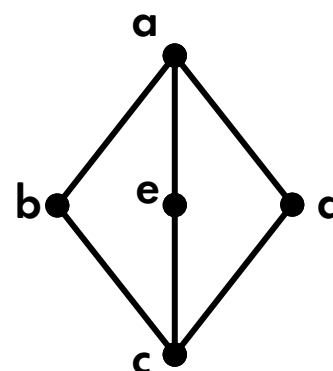
Definition: (Distributivity)

A lattice with the following properties:

$$x \wedge (y \vee z) = (x \wedge y) \vee (x \wedge z)$$

$$x \vee (y \wedge z) = (x \vee y) \wedge (x \vee z)$$

is called distributive.



Solution: The property does not hold for elements, e.g. b, e, d :

$$b \wedge (e \vee d) = b \wedge a = b$$

$$\nparallel$$

$$(b \wedge e) \vee (e \wedge d) = c \vee c = c$$

Problem 2.

Take 5 last banks from slide 3 – Rothschild, Santander, SG, UBP, UBS – as objects and 7 bank properties – BankType:Investment, BankType:Private, BankType:Universal, Owner:Private, Owner:Public, Code:Explicit, Code:No – as binary attributes. Compose the formal context with 5 objects (banks), 7 attributes (bank properties), and incidence relation according to the table in slide 3. Manually compute all concepts of this context, construct the diagram of the concept lattice and give three valid implications of this context.

Case	Country	BankType	Owner	Code	CorpC	FinLib	RegInt	BList	Wolfs
Rothschild	GBR	Investment	Private	No	0.14	1	277	Yes	No
Santander	ESP	Universal	Public	Explicit	0.77	1	53	No	Yes
SG	FRA	Universal	Public	Explicit	0.82	1	75	No	Yes
UBP	CHE	Private	Private	No	0.44	0.95	83	Yes	No
UBS	CHE	Universal	Public	Explicit	0.44	0.95	83	Yes	Yes

Solution: Let's start with building objects-attributes table:

	G \ M	a	b	c	d	e	f	g	Wolf
1	Rothschild	x			x			x	-
2	Santander		x			x	x		+
3	SG		x			x	x		+
4	UBP			x	x			x	-
5	UBS		x			x	x		+

Attributes

a – BankType: Investment;

d – Owner: Private;

g – Code: No.

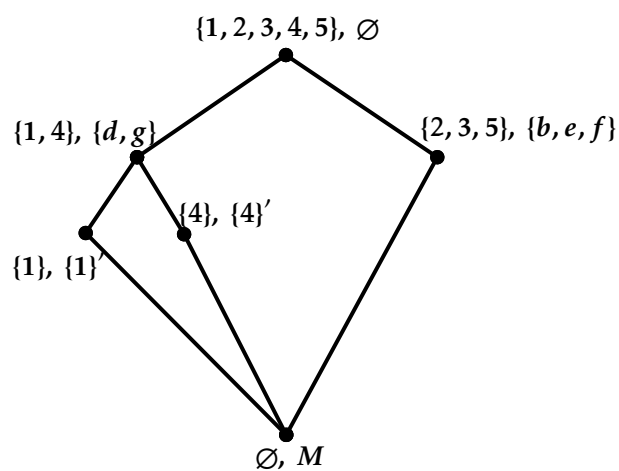
b – BankType: Universal;

e – Owner: Public;

c – BankType: Private;

f – Code: Explicit;

Objects: banks



Implications:

$$abc \rightarrow d$$

$$a \rightarrow d$$

$$cg \rightarrow a$$

■

Problem 3.

Choose your option for the big homework.

Solution: I want to select Lazy FCA option as my big homework.

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