exercise nr. 1

6 constants for 6 queens:

$C = \{ab, ca, js, ac, ch, cp\}$

6 predicates for order:

First – $1st(x)$

Second – $2nd(x)$

Third – $3rd(x)$

Fourth – $4th(x)$

Fifth – $5th(x)$

Sixth – $6th(x)$

exercise nr. 1

6 predicates for social description:

maid of honour – $Mh(x)$

former widow – $Wid(x)$

aristocrat's daughter – $Ar(x)$

german princess – $Gp(x)$

commoner – $Cm(x)$

mother of several children – $Mo(x)$

exercise nr. 1

6 predicates for end of marriage:

beheaded for misconduct – $Bm(x)$

beheaded for infidelity – $Bi(x)$

died after childbirth – $Ch(x)$

annullement – $An(x)$

divorced – $Div(x)$

death of king – $Dok(x)$

exercise nr. 1

Basic formulas

Properties of order:

$$\forall_{x \in C} \quad (1st(x) \vee \cdots \vee 6th(x))$$

$$\forall_{x \in C} \quad (1st(x) \rightarrow (\neg 2nd(x) \wedge \cdots \wedge \neg 6th(x)))$$

$$\vdots \qquad \vdots$$

$$\forall_{x \in C} \quad (6st(x) \rightarrow (\neg 1nd(x) \wedge \cdots \wedge \neg 5th(x)))$$

$$\forall_{x,y \in C, x \neq y} \neg(1st(x) \wedge 1st(y))$$

$$\vdots$$

$$\forall_{x,y \in C, x \neq y} \neg(6th(x) \wedge 6th(y))$$

Similar for social descriptions and ends of marriages

exercise nr. 1

Info from the puzzle:

$6th(cp) \wedge Dok(cp)$

$\forall_{x \in C} \quad (4th(x) \to (Gp(x) \wedge \neg Bm(x)))$

$Mh(ab) \wedge \neg 1st(ab) \wedge 5th(ch)$

$$\forall_{x \in C}(1st(x) \wedge Div(x) \to \exists_{y \in C}\,(2nd(y) \wedge Com(y)))$$
$$\vdots$$
$$\forall_{x \in C}(5th(x) \wedge Div(x) \to \exists_{y \in C}\,(6th(y) \wedge Com(y)))$$

$\neg Wid(js)$

$\forall_{x \in C}(Ar(x) \Leftrightarrow Ch(x))$

$\forall_{x \in C} Ar(x) \to (1st(ac) \wedge 2nd(x) \to \exists_{y \in C}(Mh(y) \wedge (3rd(y) \vee \cdots \vee 6th(y))))$

$$\vdots$$

$\forall_{x \in C} Ar(x) \to (4th(ac) \wedge 5th(x) \to \exists_{y \in C}(Mh(y) \wedge 6th(y)))$

exercise nr. 1

$An(ca) \wedge Mo(ca)$

$\forall_{x \in C} \quad (2nd(x) \to Bi(x))$

exercise 2(d) example

$EQ_{TM} = \{< M_1, M_2 > | M_1, M_2$ are TM

and $L(M_1) = L(M_2)\}$

$A_{TM} = \{< M, w > | M$ is TM, w is a string

and M accepts $w\}$

$A_{TM} \leq \overline{EQ_{TM}}$

M_1 accepts nothing,
M_2 accepts everything, if M accepts w.

$< M_1, M_2 > \in \overline{EQ_{TM}}$ iff $< M, w > \in A_{TM}$

exercise 2(d) example

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