

Logik und Komplexität ÜBUNG 7

Denis Erfurt, 532437
HU Berlin

Excercise 1)

a)

"The ship is huge and it is blue."

$$Huge(the_ship) \wedge Blue(the_ship) \quad (1)$$

b)

"I'm sad if the sun does not shine."

$$\neg Sun_is_shining \rightarrow Sad(I) \quad (2)$$

c)

"Either it's raining or it is not."

$$Is_raining \vee Is_not_raining \quad (3)$$

d)

"I'm only going if she is going!"

$$I_am_going \leftrightarrow She_is_going \quad (4)$$

e)

"Everyone loves chocolate or ice cream."

$$\forall x Is_someone(x) \rightarrow Loves_ice_cream(x) \vee Loves_chocolate(x) \quad (5)$$

f)

"There is somebody who loves ice cream and loves chocolate as well."

$$\exists x Is_someone(x) \wedge Loves_ice_cream(x) \wedge Loves_chocolate(x) \quad (6)$$

g)

"Everyone has got someone to play with."

$$\forall x \exists y Is_someone(x) \wedge Is_someone(y) \wedge Can_play_with(x, y) \quad (7)$$

h)

"Nobody has somebody to play with if they are all mean."

$$\neg \exists x \exists y Is_someone(x) \wedge Is_somenone(y) \wedge Is_mean(x) \wedge Can_play_with(x, y) \quad (8)$$

i)

"Cats have the same annoying properties as dogs."

$$\forall P \forall cat \forall dog (Is_annoying(P) \wedge Is_cat(cat) \wedge Is_dog(dog)) \rightarrow (P(cat) \leftrightarrow P(dog)) \quad (9)$$

Excercise 2)

a)

b)

Excercise 3)

Excercise 4)