

Assignment 5

Freitag, 19. Januar 2024

17:44

1. (a) i = 2
ii = 1
iii = 3

- (b) i = 2
ii = 3
iii = 1 Not necessary

$$2. (a) \exists x \text{ Student}(x) \text{ takes}(x, \text{Fiss09})$$

$$2 (b) \forall x \forall s \text{ takes}(x, \text{Fiss}) \Rightarrow \text{passes}(x, \text{Fiss})$$

$$3 (c) \exists x \text{ Takes}(x, \text{G1ss09}) \wedge \forall y x \neq y \neg \text{Takes}(y, \text{G1ss09})$$

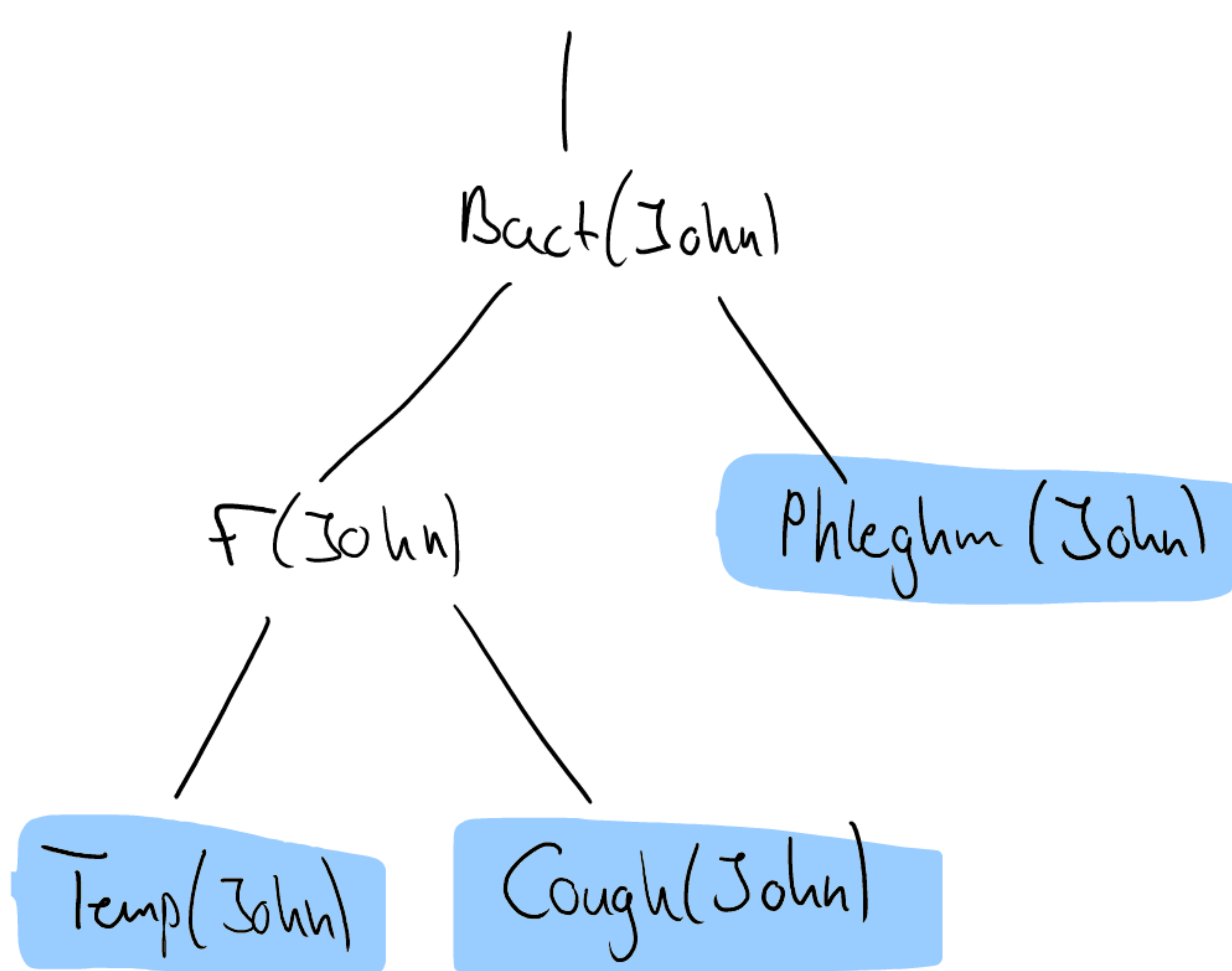
$$4 (d) \forall s \exists x \forall y \text{ Score}(x, \text{G1s}) > \text{Score}(y, \text{F1s})$$

$$5 (e) \forall x \forall z \text{ Person}(x) \wedge \text{Buys}(x, \text{Policy}, z) \Rightarrow \text{Smart}(x)$$

$$6 (f) \exists x \forall z \text{ Agent}(x) \wedge \text{Person}(z) \wedge \text{Sells}(x, \text{policies}, z) \wedge \neg \text{Insured}(z)$$

7 (g)

3. Antibiotic (John)



$$4. \alpha = \exists x L(x) \wedge \text{Place}(x, S)$$

$$I. \forall x \forall y D(x) \wedge P(x, y) \Rightarrow L(x) \wedge P(z, y)$$

$$\neg D(x) \vee \neg P(x, y) \vee (L(z) \wedge P(z, y))$$

$$\neg D(x) \vee \neg P(x, y) \vee \neg L(z) \vee \neg P(z, y)$$

$$II. \exists x D(x) \wedge P(x, S)$$

$$\neg D(x) \vee \neg P(x, S)$$

$\vee = +$
 $\wedge = *$

$$I. \forall x \forall y \exists z D(x) \wedge P(x, y) \Rightarrow L(z) \wedge P(z, y)$$

Skolem:

$$\exists z = f(x, y)$$

$$D(x) \wedge P(x, y) \Rightarrow L(f(x, y)) \wedge P(f(x, y), y)$$

CNF:

$$\neg D(x) \wedge P(x, y) \vee (L(f(x, y)) \wedge P(f(x, y), y))$$

De Morgan:

$$(\neg D(x) \vee \neg P(x, y)) \vee (L(f(x, y)) \wedge P(f(x, y), y))$$

$$\neg D(x) \vee \neg P(x, y) \vee L(f(x, y)) \wedge \neg D(x) \vee \neg P(x, y) \vee P(f(x, y), y)$$

$$II. \exists x D(x) \wedge P(x, S)$$

(Konstante = w)

$$\exists x = w$$

$$D(w) \wedge P(w, S)$$

$$III. \exists z L(z) \wedge P(z, S)$$

Konstante = M

$$\exists z = M$$

$$L(M) \wedge P(M, S)$$

$$\alpha = L(M) \wedge P(M, S)$$

$$\neg \alpha = \neg L(M) \vee \neg P(M, S)$$

KB:

$$S1: \neg \alpha = \neg L(M) \vee \neg P(M, S)$$

$$S2: D(w)$$

$$S3: P(w, S)$$

$$S4: \neg D(x) \vee \neg P(x, y) \vee L(f(x, y))$$

$$S5: \neg D(x) \vee \neg P(x, y) \vee P(f(x, y), y)$$

Resolution: Bei der Resolution man 1 "ding" pro step runner oder löschen