Elements of Deductive Logic
Exercise set #5: Translation from and into Predicate Logic

Jake Chandler *

1 To $\mathcal{L}_P$

1.1 Single quantifiers

1. A snake is a reptile.

2. A snake slipped into the kitchen.

3. Any snake found in the kitchen will be served for breakfast.

4. If any snake is found in the kitchen then John won't be coming back.

5. Snakes are not all poisonous.

6. Children are present.

7. Executives all have secretaries.

8. Only executives have secretaries.

9. Employees use only the service elevator.

10. Only employees use the service elevator.

11. Not every visitor stayed for dinner.

12. No coat is waterproof unless it has been specially treated.

13. All fruits and vegetables are wholesome and delicious.

14. Only policemen and firemen are both indispensable and underpaid.

15. If any bananas are yellow, they are ripe.

---
*Center for Logic and Analytic Philosophy, HIW, KU Leuven, Kardinaal Mercierplein 2, 3000 Leuven, Belgium

1.2   Multiple quantifiers

1. If anything is damaged, someone will be blamed.

2. If nothing is damaged, nobody will be blamed.

3. If all officers present are either captains or majors, then either some captain is present or some major is present.

4. If any officer is present, then either no majors are present or he is a major.

5. If at least one officer is present, then if all officers present are captains, then some captains are present.

6. If all survivors are fortunate and only women were survivors, then if there are any survivors, then some women are fortunate.

2   From $\mathcal{L}_P$

Dictionary:

G = . . . is a geologist

H = . . . is a hairdresser

P = . . . is a person

L = . . . is larger than. . .

Translate into English:

1. $(\forall x)(Gx \supset Hx)$

2. $\sim (\forall x)(Gx \supset Hx)$

3. $(\forall x)(Gx \supset\sim Hx)$

4. $(\exists x)(Hx \& Px)$

5. $(\forall x)(Px \supset (\exists y)(Py \& Lyx))$

6. $(\exists y)(Py \& (\forall x)(Px \supset Lyx))$

7. $(\forall x)(\forall y)(\forall z)(Lxy \supset (Lyz \supset Lxz))$

8. $(\forall x)(\forall y)(Lxy \supset\sim Lyx)$

9. $(\exists x)(Hx \& (\forall y)(Gy \supset Lxy))$

10. $(\exists x)(\forall y)(Gy \supset Lyx)$