5. Exercises for the Course
‘Description Logics’

Exercise 18:
Extend the proof of Lemma 4.1 (local correctness) to the \( \sqcap \)-rule and the \( \forall \)-rule.

Exercise 19:
Use the tableau algorithm from the lecture to decide whether the following subsumption holds:
\[
\neg \forall r.A \sqcap \forall r.C \subseteq_T \forall r.E
\]
where \( T = \{ C \equiv (\exists r.\neg B) \sqcap \neg A, \quad D \equiv \exists r.B, \quad E \equiv \neg (\exists r.A) \sqcap \exists r.D \} \).

Exercise 20:
Prove by induction Lemma 4.5 from the lecture.

Exercise 21:
Prove Lemma 4.6 from the lecture.