1. Given the following TBox $\mathcal{T}$:
   \[
   C \equiv \exists R.A \sqcap \exists R.B \\
   D \equiv \exists R.E \\
   E \sqsubseteq A \sqcap B
   \]
   show whether $C \sqsubseteq D$ holds.

2. Given the following TBox $\mathcal{T}$:
   \[
   Male \sqcup Female \sqsubseteq Person \\
   Male \sqcap Female \sqsubseteq \bot
   \]
   and the following ABox $\mathcal{A}$:
   \[
   \{Male(bart)\}
   \]
   • Is the knowledge base consistent. Use the tableaux-algorithm.
   • Is the knowledge base consistent if you add $Female(bart)$?
   • Does the knowledge base entail $Person(bart)$?

3. Given the following TBox $\mathcal{T}$:
   \[
   Father \sqsubseteq \exists hasChild.Person
   \]
   and ABox $\mathcal{A}$:
   \[
   \{Person(bart), hasChild(homer, bart)\}
   \]
   • Is the knowledge base consistent?
• Does the knowledge base entail $\text{Father}(\text{homer})$?
• Does the knowledge base entail $\text{Father}(\text{homer})$, if the subsumption is replaced by an equivalence($\text{Father} \equiv \exists \text{hasChild}. \text{Person}$)?