Problem 7.1
Consider the language $\mathcal{L}(\mathcal{R}, \mathcal{F}, \mathcal{V})$, with $\mathcal{R} = \{p/0, q/0\}$.
Given the set of formulas $S = \{p \leftarrow \neg q, q \leftarrow \neg p\}$

1. Compute $C_{\text{CWA}}(S)$.
2. Compute the completion $C_C(S)$.

Problem 7.2
Give a logic program $P$ and its completion $C_C(P)$ such that the following holds:

$$\{\neg A \mid \neg A \in C(P)\} \neq \{\neg A \mid \neg A \in C_C(P)\}$$

(Justify your answer.)

Problem 7.3
Find non-stratifiable programs $K_1$ and $K_2$ such that

- $C_C(K_1)$ is satisfiable, and
- $C_C(K_2)$ is unsatisfiable.

Problem 7.4
Reiter asked about representing “Quakers are normally pacifists and Republican are normally non-pacifists. How about Nixon, who is both a Quaker and a Republican”.

Consider the following formula:

$(\forall X)\text{pacifist}(x) \leftarrow \text{quaker}(x) \land \neg \text{abnormal}(\text{aspect1}, x)$

$(\forall X)\neg\text{pacifist}(x) \leftarrow \text{republican}(x) \land \neg \text{abnormal}(\text{aspect2}, x)$

$\text{quaker}(\text{nixon}) \land \text{republican}(\text{nixon})$

What happens when we circumscribe the predicate $\text{abnormal}$ regarding the question whether Nixon is a pacifist?