Atomic concepts:

- Store
- Issuer
- Credential
- GovernmentAgency

Atomic roles:

- HasCredential
- IssuedBy
- ControlledBy

Definitions:

- UntrustedIssuer $\equiv$ Issuer $\sqcap \neg\exists$ControlledBy.GovernmentAgency
- TrustedIssuer $\equiv \neg$ UntrustedIssuer
- UntrustedCredential $\equiv$ Credential $\sqcap \neg\exists$IssuedBy.TrustedIssuer
- TrustedCredential $\equiv$ Credential $\sqcap \exists$IssuedBy.TrustedIssuer
- TrustedStore $\equiv$ Store $\sqcap \exists$HasCredential.TrustedCredential

Concept assertions:

- Store(amazon)
- Store(malroysShadyEmporium)
- Issuer(veriSign)
- Issuer(malroysShadyEmporium)
- GovernmentAgency(nsa)
- Credential(sslCertificate_amazon)
- Credential(sslCertificate_malroysShadyEmporium)

Role assertions:

- HasCredential(amazon, sslCertificate_amazon)
- HasCredential(malroysShadyEmporium, sslCertificate_malroysShadyEmporium)
- IssuedBy(sslCertificate_amazon, veriSign)
- IssuedBy(sslCertificate_malroysShadyEmporium, malroysShadyEmporium)

- ControlledBy(veriSign, nsa)

Algorithm Rules
The $\rightarrow \sqcap$-rule
Condition: $\mathcal{A}$ contains $(C_1 \sqcap C_2)(x)$, but it does not contain both $C_1(x)$ and $C_2(x)$.
Action: $\mathcal{A}$' $= \mathcal{A} \cup \{C_1(x), C_2(x)\}$.
The $\rightarrow \sqcup$-rule
Condition: $\mathcal{A}$ contains $(C_1 \cup C_2)(x)$, but neither $C_1(x)$ nor $C_2(x)$.
Action: $\mathcal{A}$' $= \mathcal{A} \cup \{C_1(x)\}, \mathcal{A}'' = \mathcal{A} \cup \{C_2(x)\}$.
The $\rightarrow \exists$-rule
Condition: $\mathcal{A}$ contains $(\exists R.C)(x)$, but there is no individual name z such that $C(z)$ and $R(x,z)$ are in $\mathcal{A}$.
Action: $\mathcal{A}' = \mathcal{A} \cup \{C(y), R(x,y)\}$ where y is an individual name not occurring in $\mathcal{A}$.
The $\rightarrow \forall$-rule
Condition: $\mathcal{A}$ contains $(\forall R.C)(x)$ and $R(x,y)$, but it does not contain $C(y)$.
Action: $\mathcal{A}$' $= \mathcal{A} \cup C(y)$.
The $\rightarrow\geq$-rule
Condition: $\mathcal{A}$ contains $(\geq nR)(x)$, and there are no individual names $z_1 \ldots z_n$ such that $R(x,z_i)\,(1 \leq i \leq n)$ and $z_i \neq z_j\,(1 \leq i < j \leq n)$ are contained in $\mathcal{A}$.
Action: $\mathcal{A}' = \mathcal{A} \cup \{R(x,y_i) \mid (1 \leq i \leq n)\} \cup \{y_i \neq y_j \mid 1 \leq i < j \leq n\}$, where $y_1 \ldots y_n$ are distinct individual names not occurring in $\mathcal{A}$.
The $\rightarrow\leq$-rule
Condition: $\mathcal{A}$ contains distinct individual names $y_1 \ldots y_n$+1 such that $(\leq nR)(x)$ and $R(x,y_1) \ldots R(x,y_n+1)$ are in $\mathcal{A}$, and $y_i \neq y_j$ is not in $\mathcal{A}$ for some $i \leq j$.
Action: For each pair y_i, y_j such that $i > j$ and $y_i \neq y_j$ is not in $\mathcal{A}$, the ABox $\mathcal{A}_{i,j} = [y_i/y_j]\,\mathcal{A}$ is obtained from $\mathcal{A}$ by replacing each occurrence of y_i by y_j.