Corrigendum - Argumentation Semantics for Logic Programming with Explicit Negation

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1. Toshiko Wakaki in a personal communication[1] has pointed out that theorem 5 as stated is not correct. A counter example is simply the case of a program consisting of two clauses

   $$a \leftarrow \quad \text{and} \quad \neg a \leftarrow$$

   The only answer set of it is the set of all literals while the only stable extension is the empty set.

   As stable extension is always consistent, it seems that the theorem could be corrected by simple replacing the correspondence between answer set and stable extension by the correspondence between consistent answer sets and stable extensions.

   Unfortunately this "simple correction" does not hold as the following example shows:

   $$a \leftarrow not\_q \quad \text{and} \quad \neg a \leftarrow not\_q \quad \text{and} \quad c \leftarrow not\_p$$

   There is one stable extension containing argument $\{not\_p\}$ though there is no answer set for this program.

2. To get an one-one correspondence between consistent answer sets and stable extensions, we need to also consider selfdefeating argument.

   The argumentation framework for an extended logic program P should be revised as follows

   $$RAF(P) = \langle RAR_P, rattacks, rg\text{-}attacks \rangle$$

   - RAR_P consists of all arguments including selfdefeating one (i.e. $RAR_P = AR_P \cup$ set of selfdefeating arguments)

[1] Thank you again for your communication

- $rRAA\text{-}attack = RAA\text{-}attacks \cup \{(A, A) \mid A \text{ is a selfdefeating argument}\}$
  Note that a selfdefeating argument attacks only itself by reduction-ad-absurdum. It does not attack any other argument.
- $rg\text{-}attack = \{(A, B) \mid A \text{ is sound and supporting an assumption } not\_L \in B\}$[2]
- $rattacks = rRAA\text{-}attacks \cup rg\text{-}attacks$

Theorem 5 is now revised as follows:

Theorem 5(Revised)

Let P be an extended logic program. Then S is a consistent answer of P iff there is a stable extension E of $RAF(P)$ such that

$$S = \{L \mid L \text{ is supported by an argument in E}\}$$

3. As a selfdefeating argument does not attack any other argument except itself, all other semantics for $RAF(P)$ coincide with the corresponding ones for $AF(P)$.

[2] It is easy to see that $rg\text{-}attack = g\text{-}attacks \cup \{(A, B) \mid A \text{ is sound and B is selfdefeating and A supporting an assumption } not\_L \in B\}$