XOR parser recipe shown using an example

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Knowledge base $\phi = (father(x) \neq Adam) \Rightarrow (mother(x) \neq Beth)$;

1. Retrieve domain D = {Adam, Beth};
2. Convert functions in ϕ into relational CNF:
   ϕ_{rel} =
   ¬ father(x,Adam) ⇒ ¬ mother(x,Beth);
3. rank(ϕ) = k = 1
4. Perform RGND(ϕ_{rel}) wrt domain D = {Adam, Beth} ∪ {Bob}:
   ϕ_{rgnd} =
   (¬ mother(Adam,Beth) ∨ father(Adam,Adam)) ∧
   (¬ mother(Beth,Beth) ∨ father(Beth,Adam)) ∧
   (¬ mother(Bob,Beth) ∨ father(Bob,Adam)}).
5. Perform {XOR(t,D): t ∈ T} T = {father(Adam), father(Beth), father(Bob), mother(Adam), mother(Beth), mother(Bob)}:
   ϕ_{xor} =
   {(father(Adam, Adam) ∨ father(Adam, Beth) ∨ father(Adam, Bob)) ∧
   (father(Beth,Adam) ∨ father(Beth, Beth) ∨ father(Beth, Bob)) ∧
   (father(Bob,Adam) ∨ father(Bob, Beth) ∨ father(Bob,Bob)) ∧
   (mother(Adam,Adam) ∨ mother(Adam,Beth) ∨ mother(Adam,Bob)) ∧
   (mother(Beth,Adam) ∨ mother(Beth,Beth) ∨ mother(Beth, Bob)) ∧
   (mother(Bob,Adam) ∨ mother(Bob,Beth) ∨ mother(Bob,Bob))}
6. Perform XOR(ϕ) = RGND(ϕ) ∪ XOR(T,D):
   XOR(ϕ) =
   (¬ mother(Adam,Beth) ∨ father(Adam,Adam)) ∧
   (¬ mother(Beth,Beth) ∨ father(Beth,Adam)) ∧
   (¬ mother(Bob,Beth) ∨ father(Bob,Adam)) ∧
   {(father(Adam, Adam) ∨ father(Adam, Beth) ∨ father(Adam, Bob)) ∧
   (father(Beth,Adam) ∨ father(Beth, Beth) ∨ father(Beth, Bob)) ∧
   (father(Bob,Adam) ∨ father(Bob, Beth) ∨ father(Bob,Bob)) ∧
   (mother(Adam,Adam) ∨ mother(Adam,Beth) ∨ mother(Adam,Bob)) ∧
   (mother(Beth,Adam) ∨ mother(Beth,Beth) ∨ mother(Beth, Bob)) ∧
   (mother(Bob,Adam) ∨ mother(Bob,Beth) ∨ mother(Bob,Bob))}