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HW # 5

Let U be a universe containing people and songs. Let L be a language with the following predicates:

C(p,s) — Predicate. Person p composed song s.

L(p,s) — Predicate. Person p likes song s.

S(p,s) — Predicate. Person p sings song s.

M(s) — Predicate. Song s is in a major key.

Constants: A—Amy. B—Barry. D—David. Y—Yesterday (the Beatles song)

1. Amy and Barry both sing "Yesterday".

S(A, Y) ^ S(B,Y)

1. Amy does not sing any songs that Barry wrote.

∀s C(B,s) => ¬ S(A,s)

1. David does sing some songs that Barry wrote.

∃s S(D,s) ^ C(B,s)

1. David likes all the songs that Amy and Barry both sing.

∀s S(A,s) ^ S(B,s) => L(D,s)

1. Barry has not written any songs in a major key.

∀s C(B,s) => ¬ M(s)

1. There is someone who dislikes "Yesterday".

∃p ¬ L(p, Y)

1. There is someone who dislikes all the songs that David wrote.

∃p ∀s C(D,s) => ¬ L(p, s)

1. There is a songwriter who has written some songs, but not any that Amy likes.

∃p ∀s C(p,s) => ¬ L(A, s)

1. If a person dislikes "Yesterday" then the only songs they like are those they wrote themselves.

∀p,s ¬ L(p,Y) ^ L(p, s) => C(p,s)