

AI Homework 5

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1. Gershwin wrote “The Man I Love.”

(1) $Song(TheManILove) \wedge Wrote(Gershwin, TheManILove)$

2. Gershwin did not write “Elenor Rigby.”

(2) $Song(EleanorRigby) \wedge \neg Wrote(Gershwin, EleanorRigby)$

3. Either Gershwin or McCartney wrote “The Man I Love.”

(3) $Song(TheManILove) \wedge \{ [Wrote(Gershwin, TheManILove) \wedge \neg Wrote(McCartney, TheManILove)] \vee [\neg Wrote(Gershwin, TheManILove) \wedge Wrote(McCartney, TheManILove)] \}$

4. Joe has written at least one song.

(4) $\exists s Song(s) \wedge Wrote(Joe, s)$

5. Jow owns a copy of Revolver.

(5) $Album(Revolver) \wedge \exists d (CopyOf(d, Revolver) \wedge Owns(Joe, d))$

6. Every song that McCartney sings on Revolver was written by McCartney.

(6) $Album(Revolver) \wedge \forall s Song(s) \wedge Sings(McCarthy, s, Revolver) \wedge RecordedIn(s, Revolver) \Rightarrow Wrote(McCarthy, s)$

7. Gershwin did not write any of the songs on Revolver.

(7) $Album(Revolver) \wedge \forall s Song(s) \wedge RecordedIn(s, Revolver) \Rightarrow \neg Wrote(Joe, s)$

**8. Every song that Gershwin wrote has been recorded on some album.
(Possibly different songs are recorded on different album.)**

(8) $\forall s \text{ Song}(s) \wedge \text{Wrote}(\text{Gershwin}, s) \Rightarrow \exists a \text{ Album}(a) \wedge \text{RecordedIn}(s, a)$

9. There is a single album that contains every song that Joe has written.

(9) $\exists a_0 \{ \text{Album}(a_0) \wedge [\forall s \text{ Song}(s) \wedge \text{Wrote}(\text{Joe}, s) \wedge \text{RecordedIn}(s, a_0)] \wedge \neg \exists a_x (\text{Album}(a_x) \wedge \forall s \text{ Song}(s) \wedge \text{Wrote}(\text{Joe}, s) \wedge \text{RecordedIn}(s, a_x) \wedge a_0 \neq a_x) \}$

10. Joe owns a copy of an album that has Billie Holiday singing “The Man I Love.”

(10) $\text{Song}(\text{TheManILove}) \wedge \exists d \exists a \text{ Album}(a) \wedge \text{RecordedIn}(\text{TheManILove}, a) \wedge \text{CopyOf}(d, a) \wedge \text{Owns}(\text{Joe}, d)$

11. Joe owns a copy of every album that has a song sung by McCartney.

(11) $\forall a \text{ Album}(a) \wedge [\exists s \text{ Song}(s) \wedge \text{Sings}(\text{McCarthy}, s, a) \wedge \text{RecordedIn}(s, a)] \Rightarrow \exists d \text{ CopyOf}(d, a) \wedge \text{Owns}(\text{Joe}, d)$

12. Joe owns a copy of every album on which all the songs are sung by Billie Holiday.

(12) $\forall a \text{ Album}(a) \wedge [\forall s \text{ Song}(s) \wedge \text{RecordedIn}(s, a) \wedge \text{Sings}(\text{BillyHoliday}, s, a) \wedge \forall p \neg \text{Sings}(p, s, a)] \Rightarrow \exists d \text{ CopyOf}(d, a) \wedge \text{Owns}(\text{Joe}, d)$