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CPTS 440

Artificial Intelligence

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Homework #6

1.

A)

∀x Like(x, Computers) ⇒ Like(x, Coding)

∀x (Like(x, Coding) ^ Like(x, Chess)) ⇒ Learn(x, AI)

∀x ∃y Learn(x, AI) ⇒ Hire(y, x)

∀x ∃y Hire(y, x) ⇒ (Rich(x) ^ Famous(x))

B)

1. ¬Like(x, Computers) v Like(x, Coding)

2. ¬Like(x, Coding) v ¬Like(x, Chess) v Learn(x, AI)

3. ¬Learn(x, AI) v Hire(F1(x), x)

4. ¬Hire(F1(x), x) v Rich(x) ^ v Famous(x)

C)

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| **Step** | **Clause** | **Clauses Used** | **Substitutions** |
| 1 | ¬Like(x, Computers) v Like(x, Coding) | . | . |
| 2 | ¬Like(x, Coding) v ¬Like(x, Chess) v Learn(x, AI) | . | . |
| 3 | ¬Learn(x, AI) v Hire(F1(x), x) | . | . |
| 4 | (¬Hire(F1(x), x) v Rich(x)) ^ (¬Hire(F1(x), x) v Famous(x)) | . | . |
| 5 | Like(Larry, Computers) | . | . |
| 6 | Like(Larry, Chess) | . | . |
| 7 | ¬Rich(Larry) | . | . |
| 8 | Like(x1, Coding) | 1, 5 | x1 = Larry |
| 9 | Like(x2, Coding) v Like(x2, Chess) | 6, 8 | x2 = Larry |
| 10 | Learn(x3, AI) | 2, 9 | x3 = Larry |
| 11 | Hire(F1(x4), x4) | 3, 10 | x4 = Larry |
| 12 | Rich(x5) | 11, 4 | x5 = Larry |
| 13 | Proof by Refutation | 7, 12 | . |

D)

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| **Step** | **Clause** | **Clauses Used** | **Substitutions** |
| 1 | ¬Like(x, Computers) v Like(x, Coding) | . | . |
| 2 | ¬Like(x, Coding) v ¬Like(x, Chess) v Learn(x, AI) | . | . |
| 3 | ¬Learn(x, AI) v Hire(F1(x), x) | . | . |
| 4 | (¬Hire(F1(x), x) v Rich(x)) ^ (¬Hire(F1(x), x) v Famous(x)) | . | . |
| 5 | Learn(x, AI) | . | . |
| 6 | ¬Famous(x) | . | . |
| 7 | Hire(F1(x1), x1) | 3, 5 | x1 = x |
| 8 | Famous(x2) | 4, 7 | x2 = x |
| 9 | Proof by Refutation | 6, 8 | . |