

Problem 1

* All cats are animal. *

$$\forall x [Cat(x)] \Rightarrow Animal(x)$$

* Everyone who owns a car also has a bicycle

$$\forall x, y, z [Car(x) \wedge Bicycle(z) \wedge Own(x, y)] \Rightarrow Own(x, z)$$

* There is a student registered to AI class who talks to other students that are registered to AI class

$$\exists x \forall y [RegisteredAIClass(x) \wedge Talks(x, y)] \Rightarrow RegisteredAIClass(y)$$

Problem 2

<u>Languages</u>	<u>Names</u>	<u>Food</u>	<u>Music</u>
L1 \rightarrow English	N1 \rightarrow Arda	F1 \rightarrow Fish	M1 \rightarrow classic
L2 \rightarrow French	N2 \rightarrow Cihan	F2 \rightarrow Hamburger	M2 \rightarrow Jazz
L3 \rightarrow Russian	N3 \rightarrow Gonze		M3 \rightarrow Rock
L4 \rightarrow Turkish			

$$L2 \Rightarrow M2 \wedge \neg M3$$

$$L3 \Rightarrow M3$$

$$F2 \Rightarrow L1 \wedge \neg L4$$

$$F1 \wedge M1 \Rightarrow L4$$

$$N1 \Rightarrow \neg M2 \wedge \neg F2 \wedge \neg F1 \wedge \neg M1 \wedge \neg M3$$

$$N2 \Rightarrow \neg M2 \wedge M1 \wedge M3 \wedge \neg F2 \wedge \neg F1$$

$$N3 \Rightarrow F1 \wedge M1 \wedge \neg F2 \wedge \neg M2 \wedge \neg M3$$

b) 1) Which student(s) speak(s) French

Assumption 1: N1 speaks French

$$N1 \Rightarrow M2 \wedge F2 \wedge F1 \wedge \neg M1 \wedge \neg M3$$

$$L2 \Rightarrow M2 \wedge \neg M3$$

Assumption
TRUE

Assumption 2: N2 speaks French

$$N2 \Rightarrow \neg M2 \wedge M1 \wedge M3 \wedge F2 \wedge \neg F1$$

$$L2 \Rightarrow M2 \wedge \neg M3$$

There are contradictions
NOT TRUE

Assumption 3: N3 speaks French

$$N3 \Rightarrow F1 \wedge M1 \wedge \neg F2 \wedge \neg M2 \wedge \neg M3$$

$$L2 \Rightarrow M2 \wedge \neg M3$$

There is contradiction
NOT TRUE

ONLY ARAA speaks French

2) Which student(s) speak(s) both English and Turkish

Assumption 1: N1 speaks both English and Turkish

$$N1 \Rightarrow M2 \wedge F2 \wedge F1 \wedge \neg M1 \wedge \neg M3$$

$$F2 \Rightarrow L1 \wedge \neg L4$$

NOT TRUE

Assumption 2: N2 speaks both English and Turkish

$$N2 \Rightarrow \neg M2 \wedge M1 \wedge M3 \wedge F2 \wedge \neg F1$$

$$F2 \Rightarrow L1 \wedge \neg L4$$

NOT TRUE

Assumption 3: N3 speaks both English and Turkish

$$N3 \Rightarrow F1 \wedge M1 \wedge \neg F2 \wedge \neg M2 \wedge \neg M3$$

$$F2 \Rightarrow L1 \wedge \neg L4$$

$$F1 \wedge M1 \Rightarrow L4$$

Assumption
TRUE

ONLY GAMBE speaks both English and Turkish

Problem 3.

I wrote minmax code with reading text. Need to change text name from inside the code(line 14).