

CSCE 625  
Programming Assignment #4

KNOWLEDGE BASE FOR SAMMY'S SPORT SHOP

//Props

//L1W => Label of Box1 is white

//O2Y => Observed tennis ball on drawing from Box2 is yellow

//C3B => Box3 contains both yellow and white tennis balls

{L1W, L1Y, L1B, L2W, L2Y, L2B, L3W, L3Y, L3B, O1W, O1Y, O2W, O2Y, O3W, O3Y, C1W, C1Y, C1B, C2W, C2Y, C2B, C3W, C3Y, C3B}

//Propositional Rules (Knowledge Base)

//Since we know the labels are wrong

//Note that '-' means negation, 'v' means or, '^' means and, '->' means implies

L1W -> -C1W

L1Y -> -C1Y

L1B -> -C1B

L2W -> -C2W

L2Y -> -C2Y

L2B -> -C2B

L3W -> -C3W

L3Y -> -C3Y

L3B -> -C3B

//Since we know 'i'th box must contain either both, only white or only yellow tennis balls

C1B v C1W v C1Y

C2B v C2W v C2Y

C3B v C3W v C3Y

//Since we know if a box contains only white, it cannot contain only yellow or both

//Similarly for other boxes and possible colors

C1B -> -C1W ^ -C1Y

C1W -> -C1Y ^ -C1B

C1Y -> -C1B ^ -C1W

C2B -> -C2W ^ -C2Y

C2W -> -C2Y ^ -C2B

C2Y -> -C2B ^ -C2W

C3B -> -C3W ^ -C3Y

C3W -> -C3Y ^ -C3B

C3Y -> -C3B ^ -C3W

//Since we know if Box1 contains only white balls, it means Box2 and Box3 cannot have only

//white balls; and similarly for other boxes and possible colors

C1W -> -C2W ^ -C3W  
C1Y -> -C2Y ^ -C3Y  
C1B -> -C2B ^ -C3B  
C2W -> -C1W ^ -C3W  
C2Y -> -C1Y ^ -C3Y  
C2B -> -C1B ^ -C3B  
C3W -> -C2W ^ -C1W  
C3Y -> -C2Y ^ -C1Y  
C3B -> -C2B ^ -C1B

//Since we know if we observe yellow on drawing from Box1, it means Box1 can have either  
//only yellow balls, or both colored balls; and similarly for other boxes and possible colors

O1Y -> C1Y v C1B  
O1W -> C1W v C1B  
O2Y -> C2Y v C2B  
O2W -> C2W v C2B  
O3Y -> C3Y v C3B  
O3W -> C3W v C3B

//Facts

//Given in the question (We know these to be true)

L1W  
L2Y  
L3B  
O1Y  
O2W  
O3Y

//We need to prove Box2 must contain white balls

//So we negate this and add it to our Knowledge Base

-C2W

INPUT FILE FOR SAMMY'S SPORT SHOP: "[sammys.kb](#)" (converted to CNF; included in this zip file)

Note that in the program, the redundant knowledge is not stored i.e. the visited clauses that have already been stored are not stored while reading the input .kb file.

For any queries please feel free to call or message me.

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