Solution to Homework #2

I am going to skip q1 and 2

3. a. All x Mush(x) -> Pois(x)
3 b. All x Mus(x) and Pois(x) -> Col(x, Purple)
3 c. All x Mus(x) and Pois(x) -> (col(x, Purple) V col(x, Gray) V col(x, White))
3 d. All x All y Veg(x) and Likes(x, Pizza) and Mus(y) and not Pois(y) -> Likes(x,y)

4. Interpretation
Per(x): x is a person
TT(x) : x is a truth teller
Li(x) : x is a liar

Domain knowledge:

All x Per(x) -> (TT(x) V Li (x))
All x Per(x) -> not (TT(x) and Li(x))

Per(Mark)
Per(Mary)
Per(John)

Statements:
TT(John) -> (TT(Mark) and TT(Mary))
Li(John) -> not((TT(Mark) and TT(Mary))

TT(Mark) -> Li(John) and (Li(John) V Li(Mary))
Li(Mark) -> not (Li(John) and (Li(John) V Li(Mary)))

TT(Mary) -> (TT(John) and TT(Mark)) V (TT(John) and Li(Mark)) V (Li(John) and TT(Mark))
Li(Mary) -> not ((TT(John) and TT(Mark)) V (TT(John) and Li(Mark)) V (Li(John) and TT(Mark)))

5. Interpretation
Per(x): x is a person
TT(x) : x is a truth teller
Li(x) : x is a liar
Nor(x): x is a normal person

Domain knowledge:

All x Per(x) -> (TT(x) V Li (x) V Nor(x))

All x Per(x) -> not (TT(x) and Li(x) and Nor(x))
(not strong enough to capture the fact that a person belongs exclusively to only one category)

All x Per(x) -> (TT(x) and not Li(x) and not Nor(x)) V (not TT(x) and Li(x) and not Nor(x)) V
(not TT(x) and not Li(x) and Nor(x))
(correctly encode the facts that a person belongs to exactly only one category)

All x y TT(x) and Marry(x, y) -> Li (y)
All x y Li(x) and Marry(x, y) -> TT(y)
All x y Nor(x) and Marry(x, y) -> Nor(y)

Per(MrA)
Per(MrsA)
Marry(MrA, MrsA)
Marry(MrsA, MrA)

Statements:

TT(MrA) -> not (Nor(MrsA))
Li(MrA) -> Nor(MrsA)

TT(MrsA) -> not(Nor(MrA)
Li(MrsA) -> Nor(MrA)

6.
a. Those who hesitate "to act" will lose.
b. There is no business-like show business.
c. not all glitters are gold.
d. There is a person who can fool all the time.
(d is for what is written. It is supposed to be Can'tFool implying
a person can't be fooled all the time)