

ASSIGNMENT - 1

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Q1.) $\text{parent}(X,Y) = \text{"X is a parent of Y"}$.

1. $\text{parent}(X, \text{Pat})$.
2. $\text{parent}(\text{Liz}, X)$.
3. $\text{parent}(X, Y), \text{parent}(Y, \text{Pat})$.

X will be assigned as Pat's grandparent

Q2.)

- a $\text{happy}(X) :- \text{parent}(X, _)$.
- b $\text{hastwochildren}(X) :- \text{sister}(_, Y), \text{parent}(X, Y)$.
- c $\text{grandchild}(X) :- \text{parent}(_, Y), \text{parent}(Y, X)$.
- d $\text{aunt}(X, Y) :- \text{sister}(X, Z), \text{parent}(Z, Y)$.

Q3.)

1. $\text{father}(X,Y) :-$
 $\text{parent}(X,Y),$
 $\text{male}(X)$.
2. $\text{sister}(X,Y) :-$
 $\text{parent}(Z, X),$
 $\text{parent}(Z, Y),$
 $\text{female}(X), X \neq Y$.
3. $\text{grandmother}(X, Y) :-$
 $\text{female}(X),$
 $\text{parent}(X, Z), \text{parent}(Z, Y)$.
4. $\text{cousin}(X, Y) :-$
 $X \neq Y,$
 $\text{parent}(Z, X),$
 $\text{parent}(W, Y),$
 $Z \neq W,$
 $\text{parent}(V, Z),$
 $\text{parent}(V, W)$.

Q4.)

$\text{sameRank}(\text{aardvark}, \text{flume}) :- \text{soldier}(\text{aardvark}, X), \text{soldier}(\text{flume}, X)$.

Q5.)

$\text{ancestor}(X,Y) :- \text{parent}(X, Y)$. (Base Case)

$\text{ancestor}(X,Y) :- \text{parent}(X, Z), \text{ancestor}(Z, Y)$.