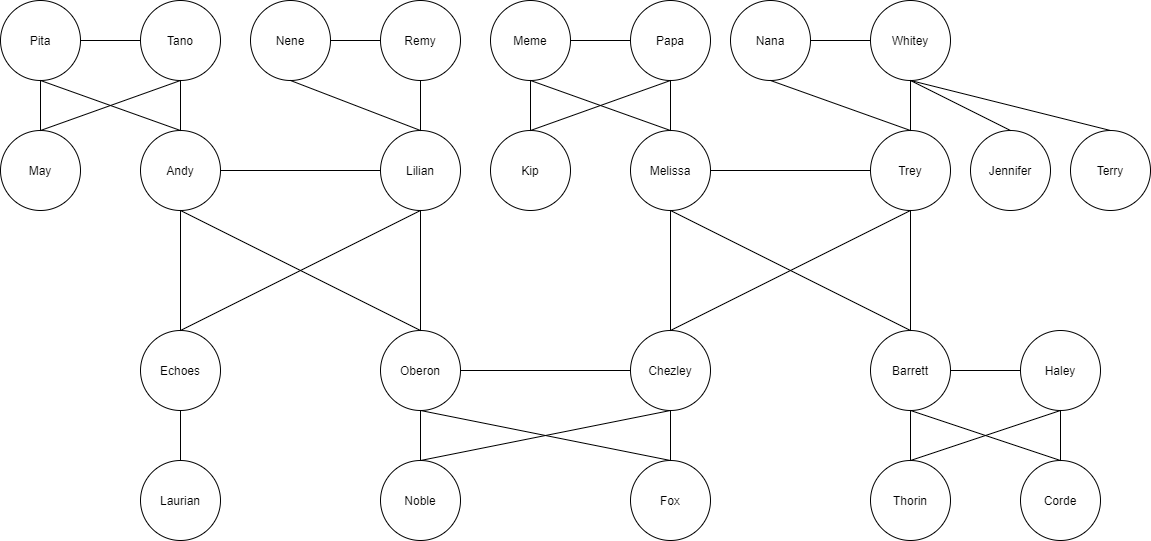
Oberon Ilano

CS 410w

Assignment 17

April 13, 2020

**1.**

****

**2.**

male(tano).

male(remy).

male(papa).

male(whitey).

male(may).

male(andy).

male(kip).

male(trey).

male(echoes).

male(oberon).

male(barrett).

male(noble).

male(fox).

male(thorin).

female(pita).

female(nene).

female(meme).

female(nana).

female(lilian).

female(melissa).

female(jennifer).

female(terry).

female(chezley).

female(haley).

female(laurian).

female(corde).

parentOf(pita, may).

parentOf(pita, andy).

parentOf(tano, may).

parentOf(tano, andy).

parentOf(nene, lilian).

parentOf(remy, lilian).

parentOf(meme, kip).

parentOf(meme, melissa).

parentOf(papa, kip).

parentOf(papa, melissa).

parentOf(whitey, trey).

parentOf(whitey, jennifer).

parentOf(whitey, terry).

parentOf(nana, trey).

parentOf(nana, jennifer).

parentOf(nana, terry).

parentOf(andy, echoes).

parentOf(andy, oberon).

parentOf(lilian, echoes).

parentOf(lilian, oberon).

parentOf(melissa, chezley).

parentOf(melissa, barrett).

parentOf(trey, chezley).

parentOf(trey, barrett).

parentOf(echoes, laurian).

parentOf(oberon, noble).

parentOf(oberon, fox).

parentOf(chezley, noble).

parentOf(chezley, fox).

parentOf(barrett, thorin).

parentOf(barrett, corde).

parentOf(haley, thorin).

parentOf(haley, corde).

marriedTo(pita, tano).

marriedTo(nene, remy).

marriedTo(meme, papa).

marriedTo(nana, whitey).

marriedTo(lilian, andy).

marriedTo(melissa, trey).

marriedTo(chezley, oberon).

marriedTo(barrett, haley).

**3.**

motherOf(Mom, Child) :- female(Mom), parentOf(Mom, Child), Mom\=Child.

fatherOf(Dad, Child) :- male(Dad), parentOf(Dad, Child), Dad\=Child.

daughterOf(C, P) :- female(C), motherOf(P, C), C\=P; female(C), fatherOf(P, C), C\=P.

sonOf(C, P) :- male(C), motherOf(P, C), C\=P; male(C), fatherOf(P, C), C\=P.

brotherOf(X, Y) :- male(X), parentOf(P, X), parentOf(P, Y), marriedTo(P, \_), X\=Y.

sisterOf(X, Y) :- female(X), parentOf(P, X), parentOf(P, Y), marriedTo(P, \_), X\=Y.

siblingOf(X, Y) :- parentOf(P, X), parentOf(P, Y), marriedTo(P, \_), X\=Y.

grandchildOf(GC, GP) :- parentOf(P, GC), parentOf(GP, P), GC\=GP.

grandparentOf(GP, GC) :- parentOf(P, GC), parentOf(GP, P), GP\=GC.

auntOf(A, C) :- female(A), parentOf(P, C), sisterOf(A, P), A\=C.

uncleOf(U, C) :- male(U), parentOf(P, C), brotherOf(U, P), U\=C.

nieceOf(N, A) :- female(N), parentOf(P, N), siblingOf(A, P), N\=A.

nephewOf(N, A) :- male(N), parentOf(P, N), siblingOf(A, P), N\=A.

ancestorOf(A, I) :- parentOf(A, I), A\=I.

ancestorOf(A, I) :- parentOf(A, P), ancestorOf(P, I), A\=I.

grandsonOf(GC, GP) :- male(GC), parentOf(P, GC), parentOf(GP, P), GC\=GP.

granddaughterOf(GC, GP) :- female(GC), parentOf(P, GC), parentOf(GP, P), GC\=GP.

grandfatherOf(GP, GC) :- male(GP), parentOf(P, GC), parentOf(GP, P), GP\=GC.

grandmotherOf(GP, GC) :- female(GP), parentOf(P, GC), parentOf(GP, P), GP\=GC.

cousinOf(C0, C1) :- parentOf(P0, C0), parentOf(P1, C1), siblingOf(P0, P1), C0\=C1.

soninlawOf(H, I) :- male(H), marriedTo(W, H), parentOf(I, W).

daughterinlawOf(W, I) :- female(W), marriedTo(W, H), parentOf(I, H); female(W), marriedTo(H, W), parentOf(I, H).

motherinlawOf(M, I) :- female(M), parentOf(M, S), marriedTo(S, I); female(M), parentOf(M, S), marriedTo(I, S).

fatherinlawOf(M, I) :- male(M), parentOf(M, S), marriedTo(S, I); male(M), parentOf(M, S), marriedTo(I, S).

**4.**

?- male(tano).

true.

?- male(remy).

true.

?- male(papa).

true.

?- male(whitey).

true.

?- male(may).

true.

?- male(andy).

true.

?- male(kip).

true.

?- male(trey).

true.

?- male(echoes).

true.

?- male(oberon).

true.

?- male(oberon).

true.

?- male(barrett).

true.

?- male(noble).

true.

?- male(fox).

true.

?- male(thorin).

true.

?- female(pita).

true.

?- female(nene).

true.

?- female(meme).

true.

?- female(nana).

true.

?- female(lilian).

true.

?- female(melissa).

true.

?- female(jennifer).

true.

?- female(terry).

true.

?- female(chezley).

true.

?- female(haley).

true.

?- female(laurian).

true.

?- female(corde).

true.

?- parentOf(X,Y).

X = pita,

Y = may ;

X = pita,

Y = andy ;

X = tano,

Y = may ;

X = tano,

Y = andy ;

X = nene,

Y = lilian ;

X = remy,

Y = lilian ;

X = meme,

Y = kip ;

X = meme,

Y = melissa ;

X = papa,

Y = kip ;

X = papa,

Y = melissa ;

X = whitey,

Y = trey ;

X = whitey,

Y = jennifer ;

X = whitey,

Y = terry ;

X = nana,

Y = trey ;

X = nana,

Y = jennifer ;

X = nana,

Y = terry ;

X = andy,

Y = echoes ;

X = andy,

Y = oberon ;

X = lilian,

Y = echoes ;

X = lilian,

Y = oberon ;

X = melissa,

Y = chezley ;

X = melissa,

Y = barrett ;

X = trey,

Y = chezley ;

X = trey,

Y = barrett ;

X = echoes,

Y = laurian ;

X = oberon,

Y = noble ;

X = oberon,

Y = fox ;

X = chezley,

Y = noble ;

X = chezley,

Y = fox ;

X = barrett,

Y = thorin ;

X = barrett,

Y = corde ;

X = haley,

Y = thorin ;

X = haley,

Y = corde

?- marriedTo(X,Y).

X = pita,

Y = tano ;

X = nene,

Y = remy ;

X = meme,

Y = papa ;

X = nana,

Y = whitey ;

X = lilian,

Y = andy ;

X = melissa,

Y = trey ;

X = chezley,

Y = oberon ;

X = barrett,

Y = haley.

?- motherOf(X,Y).

X = pita,

Y = may ;

X = pita,

Y = andy ;

X = nene,

Y = lilian ;

X = meme,

Y = kip ;

X = meme,

Y = melissa ;

X = nana,

Y = trey ;

X = nana,

Y = jennifer ;

X = nana,

Y = terry ;

X = lilian,

Y = echoes ;

X = lilian,

Y = oberon ;

X = melissa,

Y = chezley ;

X = melissa,

Y = barrett ;

X = chezley,

Y = noble ;

X = chezley,

Y = fox ;

X = haley,

Y = thorin ;

X = haley,

Y = corde ;

false.

?- fatherOf(X,Y).

X = tano,

Y = may ;

X = tano,

Y = andy ;

X = remy,

Y = lilian ;

X = papa,

Y = kip ;

X = papa,

Y = melissa ;

X = whitey,

Y = trey ;

X = whitey,

Y = jennifer ;

X = whitey,

Y = terry ;

X = andy,

Y = echoes ;

X = andy,

Y = oberon ;

X = trey,

Y = chezley ;

X = trey,

Y = barrett ;

X = echoes,

Y = laurian ;

X = oberon,

Y = noble ;

X = oberon,

Y = fox ;

X = barrett,

Y = thorin ;

X = barrett,

Y = corde ;

false.

?- daughterOf(X,Y).

X = lilian,

Y = nene ;

X = melissa,

Y = meme ;

X = jennifer,

Y = nana ;

X = terry,

Y = nana ;

X = chezley,

Y = melissa ;

X = corde,

Y = haley ;

X = lilian,

Y = remy ;

X = melissa,

Y = papa ;

X = jennifer,

Y = whitey ;

X = terry,

Y = whitey ;

X = chezley,

Y = trey ;

X = laurian,

Y = echoes ;

X = corde,

Y = barrett ;

false.

?- sonOf(X,Y).

X = may,

Y = pita ;

X = andy,

Y = pita ;

X = kip,

Y = meme ;

X = trey,

Y = nana ;

X = echoes,

Y = lilian ;

X = oberon,

Y = lilian ;

X = barrett,

Y = melissa ;

X = noble,

Y = chezley ;

X = fox,

Y = chezley ;

X = thorin,

Y = haley ;

X = may,

Y = tano ;

X = andy,

Y = tano ;

X = kip,

Y = papa ;

X = trey,

Y = whitey ;

X = echoes,

Y = andy ;

X = oberon,

Y = andy ;

X = barrett,

Y = trey ;

X = noble,

Y = oberon ;

X = fox,

Y = oberon ;

X = thorin,

Y = barrett ;

false.

?- brotherOf(X,Y).

X = may,

Y = andy ;

X = andy,

Y = may ;

X = kip,

Y = melissa ;

X = trey,

Y = jennifer ;

X = trey,

Y = terry ;

X = echoes,

Y = oberon ;

X = oberon,

Y = echoes ;

X = barrett,

Y = chezley ;

X = noble,

Y = fox ;

X = fox,

Y = noble ;

X = thorin,

Y = corde ;

false.

?- sisterOf(X,Y).

X = melissa,

Y = kip ;

X = jennifer,

Y = trey ;

X = jennifer,

Y = terry ;

X = terry,

Y = trey ;

X = terry,

Y = jennifer ;

X = chezley,

Y = barrett ;

X = corde,

Y = thorin ;

false.

?- siblingOf(X,Y).

X = may,

Y = andy ;

X = andy,

Y = may ;

X = kip,

Y = melissa ;

X = melissa,

Y = kip ;

X = trey,

Y = jennifer ;

X = trey,

Y = terry ;

X = jennifer,

Y = trey ;

X = jennifer,

Y = terry ;

X = terry,

Y = trey ;

X = terry,

Y = jennifer ;

X = echoes,

Y = oberon ;

X = oberon,

Y = echoes ;

X = chezley,

Y = barrett ;

X = barrett,

Y = chezley ;

X = noble,

Y = fox ;

X = fox,

Y = noble ;

X = thorin,

Y = corde ;

X = corde,

Y = thorin ;

false.

?- grandchildOf(X,P).

X = echoes,

P = pita ;

X = echoes,

P = tano ;

X = oberon,

P = pita ;

X = oberon,

P = tano ;

X = echoes,

P = nene ;

X = echoes,

P = remy ;

X = oberon,

P = nene ;

X = oberon,

P = remy ;

X = chezley,

P = meme ;

X = chezley,

P = papa ;

X = barrett,

P = meme ;

X = barrett,

P = papa ;

X = chezley,

P = whitey ;

X = chezley,

P = nana ;

X = barrett,

P = whitey ;

X = barrett,

P = nana ;

X = laurian,

P = andy ;

X = laurian,

P = lilian ;

X = noble,

P = andy ;

X = noble,

P = lilian ;

X = fox,

P = andy ;

X = fox,

P = lilian ;

X = noble,

P = melissa ;

X = noble,

P = trey ;

X = fox,

P = melissa ;

X = fox,

P = trey ;

X = thorin,

P = melissa ;

X = thorin,

P = trey ;

X = corde,

P = melissa ;

X = corde,

P = trey ;

false.

?- grandparentOf(X,Y).

X = pita,

Y = echoes ;

X = tano,

Y = echoes ;

X = pita,

Y = oberon ;

X = tano,

Y = oberon ;

X = nene,

Y = echoes ;

X = remy,

Y = echoes ;

X = nene,

Y = oberon ;

X = remy,

Y = oberon ;

X = meme,

Y = chezley ;

X = papa,

Y = chezley ;

X = meme,

Y = barrett ;

X = papa,

Y = barrett ;

X = whitey,

Y = chezley ;

X = nana,

Y = chezley ;

X = whitey,

Y = barrett ;

X = nana,

Y = barrett ;

X = andy,

Y = laurian ;

X = lilian,

Y = laurian ;

X = andy,

Y = noble ;

X = lilian,

Y = noble ;

X = andy,

Y = fox ;

X = lilian,

Y = fox ;

X = melissa,

Y = noble ;

X = trey,

Y = noble ;

X = melissa,

Y = fox ;

X = trey,

Y = fox ;

X = melissa,

Y = thorin ;

X = trey,

Y = thorin ;

X = melissa,

Y = corde ;

X = trey,

Y = corde ;

false.

?- auntOf(X,Y).

X = jennifer,

Y = chezley ;

X = jennifer,

Y = barrett ;

X = terry,

Y = chezley ;

X = terry,

Y = barrett ;

X = chezley,

Y = thorin ;

X = chezley,

Y = corde ;

false.

?- uncleOf(X,Y).

X = may,

Y = echoes ;

X = may,

Y = oberon ;

X = kip,

Y = chezley ;

X = kip,

Y = barrett ;

X = echoes,

Y = noble ;

X = echoes,

Y = fox ;

X = oberon,

Y = laurian ;

X = barrett,

Y = noble ;

X = barrett,

Y = fox ;

false.

?- nieceOf(X,Y).

X = chezley,

Y = kip ;

X = chezley,

Y = jennifer ;

X = chezley,

Y = terry ;

X = laurian,

Y = oberon ;

X = corde,

Y = chezley ;

false.

?- nephewOf(X,Y).

X = echoes,

Y = may ;

X = oberon,

Y = may ;

X = barrett,

Y = kip ;

X = barrett,

Y = jennifer ;

X = barrett,

Y = terry ;

X = noble,

Y = echoes ;

X = noble,

Y = barrett ;

X = fox,

Y = echoes ;

X = fox,

Y = barrett ;

X = thorin,

Y = chezley ;

false.

?- ancestorOf(X,Y).

X = pita,

Y = may ;

X = pita,

Y = andy ;

X = tano,

Y = may ;

X = tano,

Y = andy ;

X = nene,

Y = lilian ;

X = remy,

Y = lilian ;

X = meme,

Y = kip ;

X = meme,

Y = melissa ;

X = papa,

Y = kip ;

X = papa,

Y = melissa ;

X = whitey,

Y = trey ;

X = whitey,

Y = jennifer ;

X = whitey,

Y = terry ;

X = nana,

Y = trey ;

X = nana,

Y = jennifer ;

X = nana,

Y = terry ;

X = andy,

Y = echoes ;

X = andy,

Y = oberon ;

X = lilian,

Y = echoes ;

X = lilian,

Y = oberon ;

X = melissa,

Y = chezley ;

X = melissa,

Y = barrett ;

X = trey,

Y = chezley ;

X = trey,

Y = barrett ;

X = echoes,

Y = laurian ;

X = oberon,

Y = noble ;

X = oberon,

Y = fox ;

X = chezley,

Y = noble ;

X = chezley,

Y = fox ;

X = barrett,

Y = thorin ;

X = barrett,

Y = corde ;

X = haley,

Y = thorin ;

X = haley,

Y = corde ;

X = pita,

Y = echoes ;

X = pita,

Y = oberon ;

X = pita,

Y = laurian ;

X = pita,

Y = noble ;

X = pita,

Y = fox ;

X = tano,

Y = echoes ;

X = tano,

Y = oberon ;

X = tano,

Y = laurian ;

X = tano,

Y = noble ;

X = tano,

Y = fox ;

X = nene,

Y = echoes ;

X = nene,

Y = oberon ;

X = nene,

Y = laurian ;

X = nene,

Y = noble ;

X = nene,

Y = fox ;

X = remy,

Y = echoes ;

X = remy,

Y = oberon ;

X = remy,

Y = laurian ;

X = remy,

Y = noble ;

X = remy,

Y = fox ;

X = meme,

Y = chezley ;

X = meme,

Y = barrett ;

X = meme,

Y = noble ;

X = meme,

Y = fox ;

X = meme,

Y = thorin ;

X = meme,

Y = corde ;

X = papa,

Y = chezley ;

X = papa,

Y = barrett ;

X = papa,

Y = noble ;

X = papa,

Y = fox ;

X = papa,

Y = thorin ;

X = papa,

Y = corde ;

X = whitey,

Y = chezley ;

X = whitey,

Y = barrett ;

X = whitey,

Y = noble ;

X = whitey,

Y = fox ;

X = whitey,

Y = thorin ;

X = whitey,

Y = corde ;

X = nana,

Y = chezley ;

X = nana,

Y = barrett ;

X = nana,

Y = noble ;

X = nana,

Y = fox ;

X = nana,

Y = thorin ;

X = nana,

Y = corde ;

X = andy,

Y = laurian ;

X = andy,

Y = noble ;

X = andy,

Y = fox ;

X = lilian,

Y = laurian ;

X = lilian,

Y = noble ;

X = lilian,

Y = fox ;

X = melissa,

Y = noble ;

X = melissa,

Y = fox ;

X = melissa,

Y = thorin ;

X = melissa,

Y = corde ;

X = trey,

Y = noble ;

X = trey,

Y = fox ;

X = trey,

Y = thorin ;

X = trey,

Y = corde ;

false.

?- grandsonOf(X,Y).

X = echoes,

Y = pita ;

X = echoes,

Y = tano ;

X = echoes,

Y = nene ;

X = echoes,

Y = remy ;

X = oberon,

Y = pita ;

X = oberon,

Y = tano ;

X = oberon,

Y = nene ;

X = oberon,

Y = remy ;

X = barrett,

Y = meme ;

X = barrett,

Y = papa ;

X = barrett,

Y = whitey ;

X = barrett,

Y = nana ;

X = noble,

Y = andy ;

X = noble,

Y = lilian ;

X = noble,

Y = melissa ;

X = noble,

Y = trey ;

X = fox,

Y = andy ;

X = fox,

Y = lilian ;

X = fox,

Y = melissa ;

X = fox,

Y = trey ;

X = thorin,

Y = melissa ;

X = thorin,

Y = trey ;

false.

?- granddaughterOf(X,Y).

X = chezley,

Y = meme ;

X = chezley,

Y = papa ;

X = chezley,

Y = whitey ;

X = chezley,

Y = nana ;

X = laurian,

Y = andy ;

X = laurian,

Y = lilian ;

X = corde,

Y = melissa ;

X = corde,

Y = trey ;

false.

?- grandmotherOf(X,Y).

X = pita,

Y = echoes ;

X = pita,

Y = oberon ;

X = nene,

Y = echoes ;

X = nene,

Y = oberon ;

X = meme,

Y = chezley ;

X = meme,

Y = barrett ;

X = nana,

Y = chezley ;

X = nana,

Y = barrett ;

X = lilian,

Y = laurian ;

X = lilian,

Y = noble ;

X = lilian,

Y = fox ;

X = melissa,

Y = noble ;

X = melissa,

Y = fox ;

X = melissa,

Y = thorin ;

X = melissa,

Y = corde ;

false.

?- cousinOf(X,Y).

X = laurian,

Y = noble ;

X = laurian,

Y = fox ;

X = noble,

Y = laurian ;

X = fox,

Y = laurian ;

X = noble,

Y = thorin ;

X = noble,

Y = corde ;

X = fox,

Y = thorin ;

X = fox,

Y = corde ;

X = thorin,

Y = noble ;

X = thorin,

Y = fox ;

X = corde,

Y = noble ;

X = corde,

Y = fox ;

false.

?- soninlawOf(X,Y).

X = andy,

Y = nene ;

X = andy,

Y = remy ;

X = trey,

Y = meme ;

X = trey,

Y = papa ;

X = oberon,

Y = melissa ;

X = oberon,

Y = trey ;

false.

?- daughterinlawOf(X,Y).

X = lilian,

Y = pita ;

X = lilian,

Y = tano ;

X = melissa,

Y = whitey ;

X = melissa,

Y = nana ;

X = chezley,

Y = andy ;

X = chezley,

Y = lilian ;

X = haley,

Y = melissa ;

X = haley,

Y = trey ;

false.

?- motherinlawOf(X,Y).

X = nene,

Y = andy ;

X = meme,

Y = trey ;

X = melissa,

Y = oberon ;

X = melissa,

Y = haley ;

X = pita,

Y = lilian ;

X = nana,

Y = melissa ;

X = lilian,

Y = chezley ;

false

?- fatherinlawOf(X,Y).

X = remy,

Y = andy ;

X = papa,

Y = trey ;

X = trey,

Y = oberon ;

X = trey,

Y = haley ;

X = tano,

Y = lilian ;

X = whitey,

Y = melissa ;

X = andy,

Y = chezley ;

false.