

Principia Mathematica Class Definitions

Implemented in Prolog

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The Facts

```
/* Prolog database for use with predicates to simulate Dennis J. Darlands philosophy. */
```

```
/* Written 6/14/2007 */
```

```
/* mydb3.pl */
```

```
/* symbol0s are nouns */
```

```
symbol0_r(tom,'cicero_n','cicero',now).
```

```
symbol0_r(tom,'cataline_n','cataline',now).
```

```
symbol0_r(tom,'tully_n','tully',now).
```

```
symbol0_r(tom,'cicero','cicero',now).
```

```
symbol0_r(tom,'cataline','cataline',now).
```

```
symbol0_r(tom,'tully','brutus',now).
```

```
symbol0_r(tom,'tom','tom',now).
```

```
symbol0_r(tom,'tom_n','tom',now).
```

```
/* symbol1s are verbs */
```

```
symbol1_r(tom,'denounced','denounced',now).
```

```
symbol1_r(tom,'not_denounced','not_denounced',now).
```

```
symbol1_r(tom,'human','human',now).
```

```
symbol1_r(tom,'featherless_biped','featherless_biped',now).
```

```
symbol1_r(tom,'american',american,now).  
symbol1_r(tom,'roman',roman,now).  
symbol1_r(tom,'symbol0_r',symbol0_r,now).  
symbol1_r(tom,'symbol1_r',symbol1_r,now).  
symbol1_r(tom,'member_of',member_of,now).  
symbol1_r(tom,'tom_believes_now',tom_believes_now,now).
```

```
/*symbol1_r(tom,'tom_pred',tom_pred,now).
```

```
symbol1_r(tom,'tom_pred2',tom_pred2,now).
```

```
*/
```

```
/* causes stack trouble
```

```
symbol1_r(tom,'not_member_of_self',not_member_of_self,now).
```

```
*/
```

```
/*
```

```
symbol1_r(tom,'true_of_class',true_of_class,now).
```

```
*/
```

```
symbol1_r(tom,'belief_r',belief_r,now).
```

```
/* predicative functions */
```

```
predicative('denounced',denounced).
```

```
predicative('not_denounced',not_denounced).
```

```
predicative('human',human).
```

```
predicative('featherless_biped',featherless_biped).
```

```
predicative('american',american).
```

```
predicative('roman',roman).
```

```
predicative('symbol0_r',symbol0_r).
```

```
predicative('symbol1_r',symbol1_r).
```

```
predicative('tom_pred',tom_pred).
```

```
predicative('tom_pred2',tom_pred2).
```

```
/* beliefs */
```

```
belief_r(tom,'symbol1_r','tom','denounced_n','denounced',now).
belief_r(tom,'symbol1_r','tom','not_denounced_n','not_denounced',now).
belief_r(tom,'symbol0_r','tom','cicero_n','cicero',now).
belief_r(tom,'symbol0_r','tom','cataline_n','cataline',now).
belief_r(tom,'symbol0_r','tom','tully_n','tully',now).
belief_r(tom,'denounced','cicero','cataline',now).
belief_r(tom,'not_denounced','tully','cataline',now).
belief_r(tom,'human','tom',now).
belief_r(tom,'human','cicero',now).
belief_r(tom,'human','cataline',now).
belief_r(tom,'human','tully',now).
belief_r(tom,'featherless_biped','cicero',now).

/* assertions */

/* prolog croaks if there are no facts so 'no' does not count */

tom_believes_now(no).
tom_believes_now(no,no,no).
tom_believes_now(no,no,no,no).
tom_believes_now(no,no,no,no,no).

tom_pred(no).
tom_pred(no,no,no).
tom_pred(no,no,no,no).
tom_pred(no,no,no,no,no).

tom_pred2(no).
tom_pred2(no,no,no).
tom_pred2(no,no,no,no).
tom_pred2(no,no,no,no,no).
```

symbol1_r(no).

member_of(no).

not_member_of_self(no).

denounced(no,no).

not_denounced(no,no).

symbol0_r(no,no).

symbol1_r(no,no).

human(no,no).

featherless_biped(no,no).

american(no,no).

roman(no,no).

not_member_of_self(no,no).

true_of_class(no).

true_of_class(no,no).

not_denounced(no,no,no).

denounced(no,no,no,no).

not_denounced(no,no,no,no).

symbol0_r(no,no,no).

symbol1_r(no,no,no).

human(no,no,no).

featherless_biped(no,no,no).

american(no,no,no).

roman(no,no,no).

member_of(no,no,no).

not_member_of_self(no,no,no).

human(no,no,no,no).

featherless_biped(no,no,no,no).

american(no,no,no,no).

roman(no,no,no,no).

member_of(no,no,no,no).

not_member_of_self(no,no,no,no).

true_of_class(no,no,no,no).

denounced(no,no,no,no,no).

not_denounced(no,no,no,no,no).

denounced(no).

not_denounced(no).

human(no,no,no,no,no).

featherless_biped(no,no,no,no,no).

american(no,no,no,no,no).

roman(no,no,no,no,no).

member_of(no,no,no,no,no).

not_member_of_self(no,no,no,no,no).

true_of_class(no,no,no,no,no).

symbol0_r(no,no,no,no,no).

symbol1_r(no,no,no,no,no).

symbol0_r(no).

symbol1_r(no).

member_of(no).

not_member_of_self(no).

belief_r(no).

belief_r(no,no).

belief_r(no,no,no).

denounced(cicero,cataline,then).

human(tom).

human(cicero).

human(cataline).

human(tully).

featherless_biped(tom).

```
featherless_biped(cicero).
featherless_biped(cataline).
featherless_biped(tully).
american(tom).
roman(cicero).
roman(cataline).
roman(tully).
roman(brutus).
tom_pred('human','tom').
tom_pred('human','cicero').
tom_pred('human','cataline').
tom_pred('human','tully').
tom_pred2('featherless_biped','tom').
tom_pred2('featherless_biped','cicero').
tom_pred2('featherless_biped','cataline').
tom_pred2('featherless_biped','tully').
```

The Definitions

```
/* Prolog predicates to simulate Dennis J. Darlands philosophy. */
```

```
/* Written 6/14/2007 */
```

```
/* myphil.pl */
```

```
understand(S,R,A,T) :- symbol1_r(S,W,R,T) ,symbol0_r(S,X,A,T).
```

```
understand(S,R,A,B,T) :- symbol1_r(S,W,R,T) ,symbol0_r(S,X,A,T) ,symbol0_r(S,Y,B,T).
```

```
understand(S,R,A,B,C,T) :- symbol1_r(S,W,R,T) ,symbol0_r(S,X,A,T) ,symbol0_r(S,Y,B,T),symbol0_r(S,Z,C,T).
```

logical_form(RF,W,X,Y) :- RF == 'r(a,b)', symbol1_r(S,W,R,T), symbol0_r(S,X,A,T), symbol0_r(S,Y,B,T).

belief(S,R,A,T) :- belief_r(S,W,X,T) , symbol1_r(S,W,R,T) ,symbol0_r(S,X,A,T)

.

belief(S,R,A,B,T) :- belief_r(S,W,X,Y,T) , symbol1_r(S,W,R,T) ,symbol0_r(S,X,A,T) ,symbol0_r(S,Y,B,T).

belief(S,R,A,B,C,T) :- belief_r(S,W,X,Y,Z,T) , symbol1_r(S,W,R,T) ,symbol0_r(S,X,A,T) ,symbol0_r(S,Y,B,T) ,symbol0_r(S,Z,C,T).

proposition(R,A) :- understand(S,R,A,T).

proposition(R,A,B) :- understand(S,R,A,B,T).

proposition(R,A,B,C) :- understand(S,R,A,B,C,T).

true_proposition(R,A,T) :- proposition(R,A) , apply(R,[A,T]).

true_proposition(R,A,B,T) :- proposition(R,A,B) , apply(R,[A,B,T]).

true_proposition(R,A,B,C,T) :- proposition(R,A,B,C) , apply(R,[A,B,C,T]).

/* T1 is time of belief T2 is time it is believed to be true */

true_belief(S,R,A,T1,T2) :- belief(S,R,A,T1) , apply(R,[A,T2]).

true_belief(S,R,A,B,T1,T2) :- belief(S,R,A,B,T1) , apply(R,[A,B,T2]).

true_belief(S,R,A,B,C,T1,T2) :- belief(S,R,A,B,C,T1) , apply(R,[A,B,C,T2]).

symbol0(X) :- symbol0_r(S,X,A,T).

symbol1(X) :- symbol1_r(S,X,A,T).

name_1(W) :- belief_r(S,W,X,T).

/* the _1 is just to distinguish it from the built in 'name' */

name_1(X) :- belief_r(S,W,X,T).

name_1(W) :- belief_r(S,W,X,Y,T).

name_1(X) :- belief_r(S,W,X,Y,T).

name_1(Y) :- belief_r(S,W,X,Y,T).

name_1(W) :- belief_r(S,W,X,Y,Z,T).

name_1(X) :- belief_r(S,W,X,Y,Z,T).

name_1(Y) :- belief_r(S,W,X,Y,Z,T).

name_1(Z) :- belief_r(S,W,X,Y,Z,T).

/* get intensional predicate to text extensionality of classes */

tom_believes_now(P_N,X_N) :- symbol1_r(tom,P_N,P,now), symbol0_r(tom,X_N,X,now), belief_r(tom,P_N,X_N,now).

/* Principia Mathematica definition of classes in Prolog */

/* THIS ONE TO BE USED WITH RUSSELLS CLASS added args to distinguish */

true_of_class('RUSSELL','RUSSELL',F_N,PSI_N) :- symbol1_r(S,F_N,F,T), symbol1_r(S,PSI_N,PSI,T),
symbol1_r(S,PHI_N,PHI,T), equiv_r(PSI,PHI), writeln(['applying(russels class) ',F_N,' to ',PHI_N,' and ',PHI_N]),
apply(F,[PHI_N,PHI_N]).

/* THIS ONE WORKS WITH member_of, and any other 'class function' with 2 args */

true_of_class(F_N,PSI_N,X_N) :- symbol1_r(S,F_N,F,T), symbol1_r(S,PSI_N,PSI,T),symbol0_r(S,X_N,X,T),
predicative(PHI_N,PHI), equiv_r(PSI,PHI), apply(F,[PHI_N,X_N]), X_N \= no.

```
/* for 'class functions' with 1 arg */
```

```
true_of_class(F_N,PSI_N) :- symbol1_r(S,F_N,F,T), symbol1_r(S,PSI_N,PSI,T), symbol1_r(S,PHI_N,PHI,T),  
equiv_r(PSI,PHI), apply(F,[PHI_N]).
```

```
equiv_r(not_member_of_self,not_member_of_self). /* otherwise run out of stack  
*/equiv_r(true_of_class,true_of_class). /* otherwise run out of stack */
```

```
equiv_r(member_of,member_of). /* otherwise run out of stack */
```

```
equiv_r(PSI,PHI) :- not(not_equiv(PSI,PHI)).
```

```
not_equiv(PSI,PHI) :- apply(PSI,[X]),not(apply(PHI,[X])).
```

```
not_equiv(PSI,PHI) :- apply(PHI,[X]), not(apply(PSI,[X])).
```

```
not_equiv(PSI,PHI) :- apply(PSI,[X,Y]),not(apply(PHI,[X,Y])).
```

```
not_equiv(PSI,PHI) :- apply(PHI,[X,Y]), not(apply(PSI,[X,Y])).
```

```
not_equiv(PSI,PHI) :- apply(PSI,[X,Y,Z]),not(apply(PHI,[X,Y,Z])).
```

```
not_equiv(PSI,PHI) :- apply(PHI,[X,Y,Z]), not(apply(PSI,[X,Y,Z])).
```

```
not_equiv(PSI,PHI) :- apply(PSI,[W,X,Y,Z]),not(apply(PHI,[W,X,Y,Z])).
```

```
not_equiv(PSI,PHI) :- apply(PHI,[W,X,Y,Z]), not(apply(PSI,[W,X,Y,Z])).
```

```
member_of(PHI_N,X_N) :- symbol1_r(S,PHI_N,PHI,T), apply(PHI,[X]).
```

```
/* RUSSELLs PARADOX */
```

```
not_member_of_self(X,X_N) :- symbol1_r(S,X_N,X,T),  
true_of_class('RUSSELL','not_member_of_self','not_member_of_self').
```

```
not_member_of_self(X,X_N) :- symbol1_r(S,X_N,X,T),  
not(true_of_class('member_of','not_member_of_self','not_member_of_self')).
```

```
russells_class :- true_of_class('RUSSELL',X,Y).
```

```
intensional(R) :- symbol1_r(S,R_N,R,T),symbol1_r(S,X_N,X,T),symbol1_r(S,Y_N,Y,T),symbol0_r(S,A_N,A,T), apply(R,  
[X,A]) , equiv_r(X,Y), not(apply(R,[Y,A])), A \= no.
```

```
intensional(R) :- symbol1_r(S,F_N,F,T),
symbol1_r(S,R_N,R,T),symbol1_r(S,X_N,X,T),symbol1_r(S,Y_N,Y,T),symbol0_r(S,A_N,A,T),symbol0_r(S,B_N,B,T),
apply(R,[F,X,A,B]) , equiv_r(X,Y),not(apply(R,[F,Y,A,B])), A \= no.
```

```
intensional(R) :- symbol1_r(S,R_N,R,T),symbol1_r(S,X_N,X,T),symbol1_r(S,Y_N,Y,T),symbol0_r(S,A_N,A,T), apply(R,
[S,X_N,A_N,T]) , equiv_r(X,Y),not(apply(R,[S,Y_N,A_N,T])), A \= no.
```

```
/* WITH DEBUGGING
```

```
intensional(R) :- symbol1_r(S,F_N,F,T),
symbol1_r(S,R_N,R,T),symbol1_r(S,X_N,X,T),symbol1_r(S,Y_N,Y,T),symbol0_r(S,A_N,A,T),symbol0_r(S,B_N,B,T),
writeln(['intensionsal R = ',R,' F = ',F,' A = ',A,' B = ',B]),apply(R,[F,X,A,B]) , equiv_r(X,Y),not(apply(R,[F,Y,A,B])).
```

```
intensional(R) :- symbol1_r(S,F_N,F,T),
symbol1_r(S,R_N,R,T),symbol1_r(S,X_N,X,T),symbol1_r(S,Y_N,Y,T),symbol0_r(S,A_N,A,T), writeln(['intensionsal R =
',R,' F = ',F,' A = ',A,' T = ',T ]),apply(R,[F,X,A,T]) , equiv_r(X,Y),not(apply(R,[F,Y,A,T])), A \= no.
```

```
*/
```

```
intensional(R) :- symbol1_r(S,F_N,F,T),
symbol1_r(S,R_N,R,T),symbol0_r(S,X_N,X,T),symbol1_r(S,Y_N,Y,T),symbol0_r(S,A_N,A,T),symbol0_r(S,B_N,B,T),symbo
l0_r(S,C_N,C,T),apply(R,[F,X,A,B,C]) ,equiv_r(X,Y), not(apply(R,[F,Y,A,B,C])), A \= no.
```

```
intensional(R) :-
```

```
symbol1_r(S,R_N,R,T),symbol0_r(S,X_N,X,T),symbol1_r(S,Y_N,Y,T),symbol0_r(S,A_N,A,T),symbol0_r(S,B_N,B,T),apply(
R,[S,X,A,B,T]) ,equiv_r(X,Y), not(apply(R,[S,Y,A,B,T])) , A \= no.
```

```
/* NOT NEEDED YET
```

```
intensional(R) :- symbol1_r(S,F_N,F,T),
symbol1_r(S,R_N,R,T),symbol0_r(S,X_N,X,T),symbol0_r(S,A_N,A,T),symbol0_r(S,B_N,B,T),symbol0_r(S,C_N,C,T),symbo
l0_r(S,D_N,D,T),apply(R,[F,X,A,B,C,D]) ,equiv_r(X,Y), not(apply(R,[F,Y,A,B,C,D])).
```

```
*/
```

```
extensional(R) :- symbol1_r(S,R_N,R,T) ,not(intensional(R)).
```

The Consequences

(interactive session)

Yes

?- [mydb5,myphil].

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/mydb5.pl:110):

Clauses of denounced/1 are not together in the source-file

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/mydb5.pl:111):

Clauses of not_denounced/1 are not together in the source-file

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/mydb5.pl:121):

Clauses of symbol0_r/1 are not together in the source-file

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/mydb5.pl:122):

Clauses of symbol1_r/1 are not together in the source-file

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/mydb5.pl:123):

Clauses of member_of/1 are not together in the source-file

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/mydb5.pl:124):

Clauses of not_member_of_self/1 are not together in the source-file

% mydb5 compiled 0.02 sec, 17,800 bytes

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:5):

Singleton variables: [W, X]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:7):

Singleton variables: [W, X, Y]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:9):

Singleton variables: [W, X, Y, Z]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:11):

Singleton variables: [R, A, B]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:19):

Singleton variables: [S, T]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:20):

Singleton variables: [S, T]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:21):

Singleton variables: [S, T]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:31):

Singleton variables: [S, A, T]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:33):

Singleton variables: [S, A, T]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:35):

Singleton variables: [S, X, T]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:39):

Singleton variables: [S, W, T]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:41):

Singleton variables: [S, X, Y, T]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:43):

Singleton variables: [S, W, Y, T]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:45):

Singleton variables: [S, W, X, T]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:47):

Singleton variables: [S, X, Y, Z, T]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:49):

Singleton variables: [S, W, Y, Z, T]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:51):

Singleton variables: [S, W, X, Z, T]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:53):

Singleton variables: [S, W, X, Y, T]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:56):

Singleton variables: [P, X]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:60):

Redefined static procedure true_of_class/4

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:64):

Singleton variables: [X]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:67):

Redefined static procedure true_of_class/2

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:81):

Singleton variables: [X_N, S, T, X]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:85):

Singleton variables: [S, T]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:85):

Redefined static procedure not_member_of_self/2

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:86):

Singleton variables: [S, T]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:87):

Singleton variables: [X, Y]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:89):

Singleton variables: [R_N, X_N, Y_N, A_N]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:91):

Singleton variables: [F_N, R_N, X_N, Y_N, A_N, B_N]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:92):

Singleton variables: [R_N]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:97):

Singleton variables: [F_N, R_N, X_N, Y_N, A_N, B_N, C_N]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:99):

Singleton variables: [R_N, X_N, Y_N, A_N, B_N]

Warning: (/cygdrive/c/Users/Dennis/src/mine/myphil/myphil.pl:105):

Singleton variables: [S, R_N, T]

% myphil compiled 0.03 sec, 12,380 bytes

First Query

?- intensional(F).

The Response

F = tom_believes_now ;

F = tom_believes_now ;

F = tom_believes_now ;

F = tom_believes_now ;

F = tom_believes_now ;

F = belief_r ;

F = belief_r ;

F = belief_r ;

No

Second Query

?- extensional(F).

The Response

F = denounced ;

F = not_denounced ;

F = human ;

F = featherless_biped ;

F = american ;

F = roman ;

F = symbol0_r ;

F = symbol1_r ;

F = member_of ;

No

Third Query

?- true_of_class(F,C,X).

F = member_of

C = denounced

X = cicero_n ;

F = member_of

C = denounced

X = cicero_n ;

F = member_of

C = denounced

X = cataline_n ;

F = member_of

C = denounced

X = cataline_n ;

F = member_of

C = denounced

X = tully_n ;

F = member_of

C = denounced

X = tully_n ;

F = member_of

C = denounced

X = cicero ;

F = member_of

C = denounced

X = cicero ;

F = member_of

C = denounced

X = cataline ;

F = member_of

C = denounced

X = cataline ;

F = member_of

C = denounced

X = tully ;

F = member_of

C = denounced

X = tully ;

F = member_of

C = denounced

X = tom ;

F = member_of

C = denounced

X = tom ;

F = member_of

C = denounced

X = tom_n ;

F = member_of

C = denounced

X = tom_n ;

F = member_of

C = not_denounced

X = cicero_n ;

F = member_of

C = not_denounced

X = cicero_n ;

F = member_of

C = not_denounced

X = cataline_n ;

F = member_of

C = not_denounced

X = cataline_n ;

F = member_of

C = not_denounced

X = tully_n ;

F = member_of

C = not_denounced

X = tully_n ;

F = member_of

C = not_denounced

X = cicero ;

F = member_of

C = not_denounced

X = cicero ;

F = member_of

C = not_denounced

X = cataline ;

F = member_of

C = not_denounced

X = cataline ;

F = member_of

C = not_denounced

X = tully ;

F = member_of

C = not_denounced

X = tully ;

F = member_of

C = not_denounced

X = tom ;

F = member_of

C = not_denounced

X = tom ;

F = member_of

C = not_denounced

X = tom_n ;

F = member_of

C = not_denounced

X = tom_n ;

F = member_of

C = human

X = cicero_n ;

F = member_of

C = human

X = cicero_n ;

F = member_of

C = human

X = cicero_n ;

F = member_of

C = human

X = cicero_n ;

F = member_of

C = human

X = cicero_n ;

F = member_of

C = human

X = cicero_n ;

F = member_of

C = human

X = cicero_n ;

F = member_of

C = human

X = cicero_n ;

F = member_of

C = human

X = cataline_n ;

F = member_of

C = human

X = cataline_n ;

F = member_of

C = human

X = cataline_n ;

F = member_of

C = human

X = cataline_n ;

F = member_of

C = human

X = cataline_n ;

F = member_of

C = human

X = cataline_n ;

F = member_of

C = human

X = cataline_n ;

F = member_of

C = human

X = cataline_n ;

F = member_of

C = human

X = tully_n ;

F = member_of

C = human

X = tully_n ;

F = member_of

C = human

X = tully_n ;

F = member_of

C = human

X = tully_n ;

F = member_of

C = human

X = tully_n ;

F = member_of

C = human

X = tully_n ;

F = member_of

C = human

X = tully_n ;

F = member_of

C = human

X = tully_n ;

F = member_of

C = human

X = cicero ;

F = member_of

C = human

X = cicero ;

F = member_of

C = human

X = cicero ;

F = member_of

C = human

X = cicero ;

F = member_of

C = human

X = cicero ;

F = member_of

C = human

X = cicero ;

F = member_of

C = human

X = cicero ;

F = member_of

C = human

X = cicero ;

F = member_of

C = human

X = cataline ;

F = member_of

C = human

X = cataline ;

F = member_of

C = human

X = cataline ;

F = member_of

C = human

X = cataline ;

F = member_of

C = human

X = cataline ;

F = member_of

C = human

X = cataline ;

F = member_of

C = human

X = cataline ;

F = member_of

C = human

X = cataline ;

F = member_of

C = human

X = tully ;

F = member_of

C = human

X = tully ;

F = member_of

C = human

X = tully ;

F = member_of

C = human

X = tully ;

F = member_of

C = human

X = tully ;

F = member_of

C = human

X = tully ;

F = member_of

C = human

X = tully ;

F = member_of

C = human

X = tully ;

F = member_of

C = human

X = tom ;

F = member_of

C = human

X = tom ;

F = member_of

C = human

X = tom ;

F = member_of

C = human

X = tom ;

F = member_of

C = human

X = tom ;

F = member_of

C = human

X = tom ;

F = member_of

C = human

X = tom ;

F = member_of

C = human

X = tom ;

F = member_of

C = human

X = tom_n ;

F = member_of

C = human

X = tom_n ;

F = member_of

C = human

X = tom_n ;

F = member_of

C = human

X = tom_n ;

F = member_of

C = human

X = tom_n ;

F = member_of

C = human

X = tom_n ;

F = member_of

C = human

X = tom_n ;

F = member_of

C = human

X = tom_n ;

F = member_of

C = featherless_biped

X = cicero_n ;

F = member_of

C = featherless_biped

X = cicero_n ;

F = member_of

C = featherless_biped

X = cicero_n ;

F = member_of

C = featherless_biped

X = cicero_n ;

F = member_of

C = featherless_biped

X = cicero_n ;

F = member_of

C = featherless_biped

X = cicero_n ;

F = member_of

C = featherless_biped

X = cicero_n ;

F = member_of

C = featherless_biped

X = cicero_n ;

F = member_of

C = featherless_biped

X = cataline_n ;

F = member_of

C = featherless_biped

X = cataline_n ;

F = member_of

C = featherless_biped

X = cataline_n ;

F = member_of

C = featherless_biped

X = cataline_n ;

F = member_of

C = featherless_biped

X = cataline_n ;

F = member_of

C = featherless_biped

X = cataline_n ;

F = member_of

C = featherless_biped

X = cataline_n ;

F = member_of

C = featherless_biped

X = cataline_n ;

F = member_of

C = featherless_biped

X = tully_n ;

F = member_of

C = featherless_biped

X = tully_n ;

F = member_of

C = featherless_biped

X = tully_n ;

F = member_of

C = featherless_biped

X = tully_n ;

F = member_of

C = featherless_biped

X = tully_n ;

F = member_of

C = featherless_biped

X = tully_n ;

F = member_of

C = featherless_biped

X = tully_n ;

F = member_of

C = featherless_biped

X = tully_n ;

F = member_of

C = featherless_biped

X = cicero ;

F = member_of

C = featherless_biped

X = cicero ;

F = member_of

C = featherless_biped

X = cicero ;

F = member_of

C = featherless_biped

X = cicero ;

F = member_of

C = featherless_biped

X = cicero ;

F = member_of

C = featherless_biped

X = cicero ;

F = member_of

C = featherless_biped

X = cicero ;

F = member_of

C = featherless_biped

X = cicero ;

F = member_of

C = featherless_biped

X = cataline ;

F = member_of

C = featherless_biped

X = cataline ;

F = member_of

C = featherless_biped

X = cataline ;

F = member_of

C = featherless_biped

X = cataline ;

F = member_of

C = featherless_biped

X = cataline ;

F = member_of

C = featherless_biped

X = cataline ;

F = member_of

C = featherless_biped

X = cataline ;

F = member_of

C = featherless_biped

X = cataline ;

F = member_of

C = featherless_biped

X = tully ;

F = member_of

C = featherless_biped

X = tully ;

F = member_of

C = featherless_biped

X = tully ;

F = member_of

C = featherless_biped

X = tully ;

F = member_of

C = featherless_biped

X = tully ;

F = member_of

C = featherless_biped

X = tully ;

F = member_of

C = featherless_biped

X = tully ;

F = member_of

C = featherless_biped

X = tully ;

F = member_of

C = featherless_biped

X = tom ;

F = member_of

C = featherless_biped

X = tom ;

F = member_of

C = featherless_biped

X = tom ;

F = member_of

C = featherless_biped

X = tom ;

F = member_of

C = featherless_biped

X = tom ;

F = member_of

C = featherless_biped

X = tom ;

F = member_of

C = featherless_biped

X = tom ;

F = member_of

C = featherless_biped

X = tom ;

F = member_of

C = featherless_biped

X = tom_n ;

F = member_of

C = featherless_biped

X = tom_n ;

F = member_of

C = featherless_biped

X = tom_n ;

F = member_of

C = featherless_biped

X = tom_n ;

F = member_of

C = featherless_biped

X = tom_n ;

F = member_of

C = featherless_biped

X = tom_n ;

F = member_of

C = featherless_biped

X = tom_n ;

F = member_of

C = featherless_biped

X = tom_n ;

F = member_of

C = american

X = cicero_n ;

F = member_of

C = american

X = cataline_n ;

F = member_of

C = american

X = tully_n ;

F = member_of

C = american

X = cicero ;

F = member_of

C = american

X = cataline ;

F = member_of

C = american

X = tully ;

F = member_of

C = american

X = tom ;

F = member_of

C = american

X = tom_n ;

F = member_of

C = roman

X = cicero_n ;

F = member_of

C = roman

X = cicero_n ;

F = member_of

C = roman

X = cicero_n ;

F = member_of

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X = cicero_n ;

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X = cataline_n ;

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X = cataline_n ;

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X = cataline_n ;

F = member_of

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X = cataline_n ;

F = member_of

C = roman

X = tully_n ;

F = member_of

C = roman

X = tully_n ;

F = member_of

C = roman

X = tully_n ;

F = member_of

C = roman

X = tully_n ;

F = member_of

C = roman

X = cicero ;

F = member_of

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X = cicero ;

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C = roman

X = cicero ;

F = member_of

C = roman

X = cicero ;

F = member_of

C = roman

X = cataline ;

F = member_of

C = roman

X = cataline ;

F = member_of

C = roman

X = cataline ;

F = member_of

C = roman

X = cataline ;

F = member_of

C = roman

X = tully ;

F = member_of

C = roman

X = tully ;

F = member_of

C = roman

X = tully ;

F = member_of

C = roman

X = tully ;

F = member_of

C = roman

X = tom ;

F = member_of

C = roman

X = tom ;

F = member_of

C = roman

X = tom ;

F = member_of

C = roman

X = tom ;

F = member_of

C = roman

X = tom_n ;

F = member_of

C = roman

X = tom_n ;

F = member_of

C = roman

X = tom_n ;

F = member_of

C = roman

X = tom_n ;

F = member_of

C = symbol0_r

X = cicero_n ;

F = member_of

C = symbol0_r

X = cicero_n ;

F = member_of

C = symbol0_r

X = cataline_n ;

F = member_of

C = symbol0_r

X = cataline_n ;

F = member_of

C = symbol0_r

X = tully_n ;

F = member_of

C = symbol0_r

X = tully_n ;

F = member_of

C = symbol0_r

X = cicero ;

F = member_of

C = symbol0_r

X = cicero ;

F = member_of

C = symbol0_r

X = cataline ;

F = member_of

C = symbol0_r

X = cataline ;

F = member_of

C = symbol0_r

X = tully ;

F = member_of

C = symbol0_r

X = tully ;

F = member_of

C = symbol0_r

X = tom ;

F = member_of

C = symbol0_r

X = tom ;

F = member_of

C = symbol0_r

X = tom_n ;

F = member_of

C = symbol0_r

X = tom_n ;

F = member_of

C = symbol1_r

X = cicero_n ;

F = member_of

C = symbol1_r

X = cicero_n ;

F = member_of

C = symbol1_r

X = cataline_n ;

F = member_of

C = symbol1_r

X = cataline_n ;

F = member_of

C = symbol1_r

X = tully_n ;

F = member_of

C = symbol1_r

X = tully_n ;

F = member_of

C = symbol1_r

X = cicero ;

F = member_of

C = symbol1_r

X = cicero ;

F = member_of

C = symbol1_r

X = cataline ;

F = member_of

C = symbol1_r

X = cataline ;

F = member_of

C = symbol1_r

X = tully ;

F = member_of

C = symbol1_r

X = tully ;

F = member_of

C = symbol1_r

X = tom ;

F = member_of

C = symbol1_r

X = tom ;

F = member_of

C = symbol1_r

X = tom_n ;

F = member_of

C = symbol1_r

X = tom_n ;

F = tom_believes_now

C = human

X = cicero ;

F = tom_believes_now

C = human

X = cicero ;

F = tom_believes_now

C = human

X = cataline ;

F = tom_believes_now

C = human

X = tully ;

F = tom_believes_now

C = human

X = tom ;

F = tom_believes_now

C = featherless_biped

X = cicero ;

F = tom_believes_now

C = featherless_biped

X = cicero ;

F = tom_believes_now

C = featherless_biped

X = cataline ;

F = tom_believes_now

C = featherless_biped

X = tully ;

F = tom_believes_now

C = featherless_biped

X = tom ;

No

Another Query

?- belief_r(S,F,X,T).

The Response

S = tom

F = human

X = tom

T = now ;

S = tom

F = human

X = cicero

T = now ;

S = tom

F = human

X = cataline

T = now ;

S = tom

F = human

X = tully

T = now ;

S = tom

F = featherless_biped

X = cicero

T = now ;

No

?- belief_r(S,F,X,Y,T).

S = tom

F = denounced

X = cicero

Y = cataline

T = now ;

S = tom

F = not_denounced

X = tully

Y = cataline

T = now ;

No

?- belief_r(S,F,X,Y,Z,T).

S = tom

F = symbol1_r

X = tom

Y = denounced_n

Z = denounced

T = now ;

S = tom

F = symbol1_r

X = tom

Y = not_denounced_n

Z = not_denounced

T = now ;

S = tom

F = symbol0_r

X = tom

Y = cicero_n

Z = cicero

T = now ;

S = tom

F = symbol0_r

X = tom

Y = cataline_n

Z = cataline

T = now ;

S = tom

F = symbol0_r

X = tom

Y = tully_n

Z = tully

T = now ;

No

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