```
%Assignment - 1
male(jack).
male(oliver).
male(ali).
male(james).
male(simon).
male(harry).
female(helen).
female(sophie).
female(jess).
female(lily).

parent_of(jack,jess).
parent_of(jack,lily).
parent_of(helen, jess).
parent_of(helen, lily).
parent_of(oliver,james).
parent_of(sophie, james).
parent_of(jess, simon).
parent_of(ali, simon).
parent_of(lily, harry).
parent_of(james, harry).

%Rules
father_of(X,Y):- male(X),
    parent_of(X,Y).

mother_of(X,Y):- female(X),
    parent_of(X,Y).

grandfather_of(X,Y):- male(X),
    parent_of(X,Z),
    parent_of(Z,Y).

grandmother_of(X,Y):- female(X),
    parent_of(X,Z),
    parent_of(Z,Y).

sister_of(X,Y):-    female(X),
    parent_of(F, Y), parent_of(F, X),X \= Y.


brother_of(X,Y):- male(X),
    parent_of(F, Y), parent_of(F,X),X \= Y.

aunt_of(X,Y):- female(X),
    parent_of(Z,Y), sister_of(X,Z).

uncle_of(X,Y):- male(X),
    parent_of(Z,Y), brother_of(X, Z).

ancestor_of(X,Y):- parent_of(X,Y).
ancestor_of(X,Y):- parent_of(Z,Y),
    ancestor_of(X,Z).
%Assignment - 2
find_sum(A,     B):- R is A + B, write('sum = '), write(R).
%Assignment - 3
find_product(A, B, C):- R is A * B * C, write('product = '), write(R).
%Assignment - 4
find_odd_even(A, X):- X =:= 0, write(A), write(' is even').
find_odd_even(A, X):- X =\= 0, write(A), write(' is odd').
odd_even(A):- R is (A mod 2), find_odd_even(A, R).
%Assignment - 5
max_val(X, Y, X):- X >= Y.
max_val(X, Y, Y):- Y >= X.
%Assignment - 6
smallest(X, Y, Z, X):- X =< Y, X =< Z.
smallest(X, Y, Z, Y):- Y =< X, Y =< Z.
smallest(X, Y, Z, Z):- Z =< X, Z =< Y.
%Assignment - 7
largest(X, Y, Z, X):- X >= Y, X >= Z.
largest(X, Y, Z, Y):- Y >= X, Y >= Z.
```

```
largest(X, Y, Z, Z):- Z >= X, Z >= Y.
maxdiff(A, B, C):- X is abs(A-B),
    Y is abs(A-C),
    Z is abs(B-C),
    largest(X, Y, Z, R), write('max difference is '), write(R).
%Assignment - 8
find_ans(A, B, C, X, Y, Z, R):- R =:= X, write(' closest pair is '), write(A),
write(' and '), write(B).
find_ans(A, B, C, X, Y, Z, R):- R =:= Y, write(' closest pair is '), write(A),
write(' and '), write(C).
find_ans(A, B, C, X, Y, Z, R):- R =:= Z, write(' closest pair is '), write(B),
write(' and '), write(C).
closest(A, B, C):- X is abs(A-B),
    Y is abs(A-C),
    Z is abs(B-C),
    smallest(X, Y, Z, R),
    find_ans(A, B, C, X, Y, Z, R).

```