

Name : Brijesh Rohit
Admission number : U19CS009

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%U19CS009
%BRIJESH ROHIT

% 1. Find the total number of diseases for each patient.
% 2. Find the name and zip code of each patient.
% 3. Write P_Id and name of all patients staying in Delhi.
% 4. List name of all patients treated by doctor D1.
% 5. List roll no. of all patients suffering from Common cold
% 6. List building_name and city_code for all patients in the
given format (format: [(building_name, citycode)]).
% 7. List all doctors for each given patient.

patient(p101, brijesh, address(shlimar_park, surat, 395001),
[sub(d1,common_cold),sub(d2,flu)]).
patient(p102, aman, address(honey_park, delhi, 110002),
[sub(d3,chicken_pox), sub(d2,flu)]).
patient(p103, dhruv, address(shally_tower, mumbai,400004
),[sub(d4,measles), sub(d2, flu), sub(d3,chicken_pox)]).
patient(p104, neel, address(neelu_parlor,surat,395007),
[sub(d3,flu), sub(d1,common_cold), sub(d3,chicken_pox)]).
patient(p105, krina,
address(abcd,delhi,200011),[sub(d3,chicken_pox),
sub(d1,common_cold), sub(d2,flu)]).

go :-
    write('What is the patient's name? '),
    read(Patient),
    hypothesis(Patient,Disease),
    write_list([Patient,'probably has ',Disease,'.']),nl.

go :-
    write('Sorry, I don't seem to be able to'),nl,
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write('diagnose the disease. '),nl.

symptom(Patient,fever) :-
    write_list(['Does ',Patient,' have a fever (y/n) ?']),
    response(Reply) ,
    Reply='y'.

symptom(Patient,rash) :-
    write_list(['Does ',Patient,' have a rash (y/n) ?']),
    response(Reply) ,
    Reply='y'.

symptom(Patient,headache) :-
    write_list(['Does ',Patient,' have a headache (y/n) ?']),
    response(Reply) ,
    Reply='y'.

symptom(Patient,runny_nose) :-
    write_list(['Does ',Patient,' have a runny_nose (y/n) ?']),
    response(Reply) ,
    Reply='y'.

symptom(Patient,conjunctivitis) :-
    write_list(['Does ',Patient,' have a conjunctivitis (y/n)
?']),
    response(Reply) ,
    Reply='y'.

symptom(Patient,cough) :-
    write_list(['Does ',Patient,' have a cough (y/n) ?']),
    response(Reply) ,
    Reply='y'.

symptom(Patient,body_ache) :-
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write_list(['Does ',Patient,' have a body_ache (y/n) ?']),
response(Reply) ,
Reply='y' .

symptom(Patient,chills) :-
    write_list(['Does ',Patient,' have a chills (y/n) ?']),
    response(Reply) ,
    Reply='y' .

symptom(Patient,sore_throat) :-
    write_list(['Does ',Patient,' have a sore_throat (y/n) ?']),
    response(Reply) ,
    Reply='y' .

symptom(Patient,sneezing) :-
    write_list(['Does ',Patient,' have a sneezing (y/n) ?']),
    response(Reply) ,
    Reply='y' .

symptom(Patient,swollen_glands) :-
    write_list(['Does ',Patient,' have a swollen_glands (y/n)
?']),
    response(Reply) ,
    Reply='y' .

hypothesis(Patient,measles) :-
    symptom(Patient,fever) ,
    symptom(Patient,cough) ,
    symptom(Patient,conjunctivitis) ,
    symptom(Patient,runny_nose) ,
    symptom(Patient,rash) .

hypothesis(Patient,flu) :-
    symptom(Patient,fever) ,

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    symptom(Patient,headache) ,
    symptom(Patient,body_ache) ,
    symptom(Patient,conjunctivitis) ,
    symptom(Patient,chills) ,
    symptom(Patient,sore_throat) ,
    symptom(Patient,runny_nose) ,
    symptom(Patient,cough) .

hypothesis(Patient,common_cold) :-
    symptom(Patient,headache) ,
    symptom(Patient,sneezing) ,
    symptom(Patient,sore_throat) ,
    symptom(Patient,runny_nose) ,
    symptom(Patient,chills) .

hypothesis(Patient,chicken_pox) :-
    symptom(Patient,fever) ,
    symptom(Patient,chills) ,
    symptom(Patient,body_ache) ,
    symptom(Patient,rash) .

hypothesis(Patient,measles) :-
    symptom(Patient,cough) ,
    symptom(Patient,sneezing) ,
    symptom(Patient,runny_nose) .

write_list([]) .
write_list([Term| Terms]) :-
    write(Term) ,
    write_list(Terms) .

response(Reply) :-
    get_single_char(Code) ,
    put_code(Code) , nl,

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    char_code(Reply, Code).

list_length([], 0).
list_length([_|Xs], L) :- list_length(Xs, N) , L is N + 1.

q1:-
    patient(_, N, _, S),
    write('All diseases of patient '), write(N), write(': '),
    list_length(S, Length), write(Length), nl, fail.

q2:-
    patient(_, X, address(_, _, Z), _), nl,
    write('Name: '), write(X), nl,
    write('Zipcode: '), write(Z), nl, fail.

q3:-
    Goal = (patient(Roll, Name, address(_, C, _), _), C =
delhi),
    findall(Roll/Name, Goal, L),
    maplist(write, L).

get_subjects(Z):-
    patient(_,Name,_, Subjects),
    member(Subject, Subjects),
    Subject = sub(d1, Z),
    write(Name), nl.

q4:-
    findall(Z, get_subjects(Z), L),
    sort(L, Y),

q5:-
    patient(_, R, _, Subjects),
    member(Subject, Subjects),

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Subject = sub(_, common_cold),  
write(R),  
nl,  
fail.
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q6:-

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patient(_,_,address(B, C, _), _),  
write(B),write(', '), write(C),nl,fail.
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% q7:- q7(p102).

q7() :-

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patient(R, _, _, Disease),  
write('Doctors for: '), write(R), nl,  
member(Subject, Disease),  
Subject = sub(T, _),  
write(T),nl,fail.
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get_all_subjects(Z) :-

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student(_,_,_, Subjects),  
member(Subject, Subjects),  
Subject = sub(_, Z),!.
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Q1 :

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1 ?- consult("u19cs009.pl").  
ERROR: c:/users/brijesh/documents/ai/ai  
true.  
  
2 ?- q1.  
All diseases of patient brijesh: 2  
All diseases of patient aman: 2  
All diseases of patient dhruv: 3  
All diseases of patient neel: 3  
All diseases of patient krina: 3  
false.
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Q2 :

3 ?- q2.

Name: brijesh
Zipcode: 395001

Name: aman
Zipcode: 110002

Name: dhruv
Zipcode: 400004

Name: neel
Zipcode: 395007

Name: krina
Zipcode: 200011
false.

Q3 :

4 ?- q3.
p102/amanp105/krina
true.

Q4 :

7 ?- q4.
brijesh
neel
krina
true.

Q5 :

8 ?- q5.
brijesh
neel
krina
false.

Q6 :

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9 ?- q6.  
shlimar_park, surat  
honey_park, delhi  
shally_tower, mumbai  
neelu_parlor, surat  
abcd, delhi  
false.
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Q7 :

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10 ?- q7.  
Doctors for: p101  
d1  
d2  
Doctors for: p102  
d3  
d2  
Doctors for: p103  
d4  
d2  
d3  
Doctors for: p104  
d3  
d1  
d3  
Doctors for: p105  
d3  
d1  
d2  
false.
```