PPL LAB 5

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Find the results for following questions using PROLOG program:

1. Find total number of subjects chosen by each student.
2. Find name and zipcode of each student.
3. Write roll no. and name of all students staying in delhi.
4. List name of all subjects taken by teacher t1.
5. List roll no. of all students learning "hindi" subject
6. List building_name and city_code for all students in the given format (format: [(building_name, citycode)]).
7. List all teachers (teaching codes) for each given student.
8. Find the subject, which is maximum chosen.
9. List all subjects taken by each teacher.

Rules:

```
student(u223, ram, address(shlimar_park, surat, 395001),
[sub(t1,algebra),sub(t2,physics), sub(t3,english), sub(t5,hindi)]).

student(u226, lakshman, address(honey_park, delhi, 110002), [sub(t3,history),
sub(t4,science), sub(t1,geometry), sub(t5, hindi)]).

student(u227, bharat, address(shally_tower, mumbai,400004 ),[sub(t1,geometry),
sub(t2, chemistry), sub(t3,english_grammer)]).
```

q1:

```
q1:-

  student(_, N, _, S),

  write('Total subjects of '), write(N), write(': '),

  list_length(S, Length), write(Length), nl, fail.
```

```
?- q1.
Total subjects of ram: 4
Total subjects of lakshman: 4
Total subjects of bharat: 3
false.
```

q2:

```
q2:-

  student(_, X, address(_, _, Z), _), nl,

  write('Name: '), write(X), nl,

  write('Zipcode: '), write(Z), nl, fail.
```

```
?- q2.

Name: ram
Zipcode: 395001

Name: lakshman
Zipcode: 110002

Name: bharat
Zipcode: 400004
false.
```

q3:

```
q3:-

  Goal = (student(Roll, Name, address(_, C, _), _), C = delhi),

  findall(Roll/Name, Goal, L),

  maplist(write, L).
```

```
?- q3.
u226/lakshman
true.
```

q4:

```
get_subjects(Z):-

  student(_,_,_, Subjects),

  member(Subject, Subjects),

  Subject = sub(t1, Z).




q4:-

  findall(Z, get_subjects(Z), L),

  sort(L, Y),

  write(Y).
```

```
?- q4.
[algebra,geometry]
true.
```

q5:

```
q5:-

  student(R, _, _, Subjects),

  member(Subject, Subjects),

  Subject = sub(_, hindi),

  write(R),

  nl,
```

```
    fail.
```

```
?- q5.
u223
u226
false.
```

q6:

```
q6:-

  student(_,_,address(B, C, _), _),

  write(B),write(', '), write(C),nl, fail.
```

```
?- q6.
shlimar_park, surat
honey_park, delhi
shally_tower, mumbai
false.
```

q7:

```
q7 :- q7(u223).

q7(R):-

write('Teachers for: '), write(R), nl,

  student(R, _, _, Subjects),

  member(Subject, Subjects),

  Subject = sub(T, _),

  write(T),nl,

  fail.
```

```
?- q7.
Teachers for: u223
t1
t2
t3
t5
false.
```

q8:

```
get_all_subjects(Z):-

  student(_,_,_, Subjects),

  member(Subject, Subjects),

  Subject = sub(_, Z).


q8:-

  findall(Z, get_all_subjects(Z), L),

  aggregate(max(C,E),aggregate(count,member(E,L),C),max(Count, Name)),

  write(Name), write(': '), write(Count).
```

```
?- q8.
geometry: 2
true.
```

q9:

```
get_teachers(Teacher):-

  student(_,_,_,Subjects),

  member(Subject, Subjects),
```

```prolog
    Subject = sub(Teacher, _).


get_subjects(Teacher, Sub):-

  student(_, _, _, Subjects),

  member(Subject, Subjects),

  Subject = sub(Teacher, Sub).


q9:-

  findall(Teacher, get_teachers(Teacher), Teachers),

  sort(Teachers, Unique_Teachers),

  member(T, Unique_Teachers),

  write(T),write(': '),

  findall(S, get_subjects(T, S), Subs),

  sort(Subs, Unique_Subs),

  write(Unique_Subs),nl,fail.
```

```
?- q9.
t1: [algebra,geometry]
t2: [chemistry,physics]
t3: [english,english_grammer,history]
t4: [science]
t5: [hindi]
false.
```