```
-- A solution prepared by Davood Rafiei (Oct 5, 2022)

--Question 1
  select distinct s.sid, s.title
  from songs s, perform p, artists a
  where s.sid=p.sid and a.aid=p.aid and (a.nationality='Canada' or a.nationality='Canadian');

--Question 2
  select distinct u.uid, u.name
  from users u, listen l, artists a, perform r
  where u.uid=l.uid and l.sid=r.sid and r.aid=a.aid and
        (lower(a.nationality) = 'canada' or lower(a.nationality) = 'canadian');

--Question 3
  select l1.uid
  from listen l1, listen l2, perform p1, perform p2, artists a1, artists a2
  where l1.uid=l2.uid and l1.sid=p1.sid and l2.sid=p2.sid and
        p1.aid=a1.aid and p2.aid=a2.aid and
        lower(a1.name)='drake' and lower(a2.name)='celine dion'
  except
  select l.uid
  from listen l, perform p, artists a
  where l.sid=p.sid and p.aid=a.aid and lower(a.name)='avril lavigne';

--Question 4
  select l.uid, p.aid, sum(l.cnt*s.duration)
  from listen l, songs s, perform p
  where l.sid=s.sid and s.sid=p.sid
  group by l.uid, p.aid;


--Question 5
  select distinct l.uid, p.aid
  from listen l, songs s, perform p
  where l.sid=s.sid and s.sid=p.sid and
        uid in (select l1.uid
                from listen l1
                group by l1.uid
                having count (distinct l1.sid)>5) and
        aid in (select p1.aid
                from listen l1, songs s1, perform p1
                where l1.uid=l.uid and l1.sid=s1.sid and s1.sid=p1.sid
                group by p1.aid
                order by sum(l1.cnt*s1.duration) desc
                limit 3);


--Question 6
  select distinct strftime('%m',s.start), l.sid
  from sessions s, listen l
  where s.uid=l.uid and s.sno=l.sno and
        l.sid in (select l2.sid
                  from sessions s2, listen l2
                  where s2.uid=l2.uid and s2.sno=l2.sno and
                        strftime('%m',s.start)=strftime('%m',s2.start)
                  group by l2.sid
                  order by count(distinct s2.uid) desc
                  limit 3);
-- Question 6 (the same months in different years are treated different)
  select distinct strftime('%Y-%m',s.start), l.sid
  from sessions s, listen l
  where s.uid=l.uid and s.sno=l.sno and
        l.sid in (select l2.sid
                  from sessions s2, listen l2
                  where s2.uid=l2.uid and s2.sno=l2.sno and
                        strftime('%Y-%m',s.start)=strftime('%Y-%m',s2.start)
                  group by l2.sid
                  order by count(distinct s2.uid) desc
                  limit 3);


--Question 7
  select a.aid, s.sid
  from (select sid, count(distinct uid) as cnt
        from listen
        group by sid) s,
       (select p.aid, count(distinct uid) as cnt
        from perform p, listen l
        where p.sid=l.sid
        group by p.aid
        order by count(distinct uid) desc
        limit 5) a,
       perform p
  where p.sid=s.sid and p.aid=a.aid and
     s.cnt >= ( select max(cnt)
                from (select count(distinct uid) as cnt
                      from perform pp, listen l1
                      where pp.sid=l1.sid and pp.aid=a.aid
                      group by pp.sid) t);

--Question 8
  with SP(uid, sno, pid, cnt) as (
     select l.uid, l.sno, p.pid, count(*)
     from listen l, plinclude p
     where l.sid=p.sid
     group by l.uid, l.sno, p.pid),
  S (uid, sno, cnt) as (
     select uid, sno, count(*)
     from listen
     group by uid, sno)
  select S.uid, S.sno, p.pid, p.title
  from SP, S, playlists p
  where SP.uid=S.uid and SP.sno=S.sno and SP.pid=p.pid and
        S.cnt>=3 and SP.cnt >= 0.7*S.cnt;


--Question 9
  drop view if exists song_details;
  create view song_details(id, title, duration, cntL, cntP, cntU) as
  select s.sid, s.title, s.duration, ifnull(lCnt,0), ifnull(pCnt,0), ifnull(uCnt,0)
  from songs s left outer join
        (select sid, sum(cnt) as lCnt, count(distinct uid) as uCnt
         from listen
         group by sid) l on s.sid=l.sid
        left outer join
        (select sid, count(pid) as pCnt
         from plinclude
         group by sid) p on s.sid=p.sid;


--Question 10
  select sd.id, sd.title, a.name, 'top in listens'
  from song_details sd, perform p, artists a
  where sd.id=p.sid and p.aid=a.aid and
        cntL >= (select max(cntL) from song_details)
  union
  select sd.id, sd.title, a.name, 'top in playlists'
  from song_details sd, perform p, artists a
  where sd.id=p.sid and p.aid=a.aid and
        cntP >= (select max(cntP) from song_details)
  union
  select sd.id, sd.title, a.name, 'top in users'
  from song_details sd, perform p, artists a
  where sd.id=p.sid and p.aid=a.aid and
        cntU >= (select max(cntU) from song_details);
```