Quiz 1, Fall 2018
CSCI 4380 Database Systems
Time: 25 minutes

Name 1: _____
Name 2: _____
Name 3: _____

Rules.

- Open book and notes. Do not use any electronic tools including your computer.
- You can talk to anyone in class. If you know the answer, help someone else in class.
- Each quiz must be by at least two and at most three people. Most quizzes should be by three people, so find someone to talk to. Put your name on one quiz only.

Question (Points: a-8 b-8 c-9). You are given the following data model for elections:

```
Parties(name, url, description, foundedon)
Elections(id, name, etype, state, howoften)
Person(id, fname, lname, bio, birthday)
Candidates(personid, eid, year, partyname, ballotposition, numvotes)
```

Keys are underlined. There are many `parties` (even though some small) and many `elections`. Each election has a `name` and a `etype`. `elections.type` is either `'state'` or `'federal'`. For state elections there is a state listed (e.g. `'NY'`. Attribute `elections.howoften` lists how many years this election occurs regularly.

People run as candidates for different elections, which is stored in the `Candidates` relation. Each candidate runs for a specific party. If they are independent, `candidates.partyname` is `NULL`. Ballotposition is a number (1,2,3) that shows where they appear on the ballot. If they are not on any ballot (write-in candidate), then ballotposition is zero.

Answer the following questions:

(a) For the following, circle one of yes/no based on the relations above and its keys, and write a short one line explanation:

Can a candidate run for two different elections (i.e. different eid) in the same year? YES-NO

Can a candidate run for two different ballot positions in the same election (same eid) in the same year? YES-NO

Can two different elections have the same name ? YES-NO

Can the same person be candidate for different political parties in the same year? YES-NO

(b) Write the following query using relational algebra:

Return the name of all parties that had candidates running only for `'federal'` elections, but no `'state'` elections.

(c) Write the following query using relational algebra:

Return the name of all people who ran as a candidate for two different political parties for the same election in different years.