**CS 157A Spring 2020 Homework 3  
Point: 20 (each question is 1 point)**Part 1 (Listen to the Video lecture on DB Internals and answer following questions):

1. What is the typical size of Disk Block?
   1. 64 bytes
   2. 8K bytes
   3. 64K bytes
   4. 4K bits
2. Database file can have at most one Disk Block? **FALSE**
3. Which search strategy works better if database is on hard drive?
   1. (a) Multiple access times and small transfer time
   2. (b) Single access time and large transfer time
4. Table records can be sorted on multiple attributes of the table? True/False
5. In sequential file organization, records are sorted/ordered according to the value of one attribute (“Search Key”). Should Search Key always be primary key of the table?  
   (a) Yes  
   (b) No

(c) Does not matter (Search key can be any attribute)

Part 2: SQL questions  
The following queries are based on the 1994 census data (1994-census-summary.sql)

1. which native countries have "land" in their name?

select distinct native\_country from census where native\_country LIKE '%land%';

England

Poland

Thailand

Scotland

Ireland

Holand\_Netherlands

1. what is the average education years for people having a native country that is not the US?

select avg(education\_num) from census where native\_country NOT LIKE 'US';

10.0806793403151

1. how many different native countries are found in the data set?

select count(distinct(native\_country)) from census;  
42

Part 3: SQL questions (use Natural Join)  
The following queries are based on the courses-ddl.sql and courses-small.sql data

1. what are the names of all students who have taken some course? Don't show duplicates.

select distinct(name) from student natural join takes;

1. what are the names of departments that offer 4-credit courses? Don't list duplicates.

select distinct(department.dept\_name) from course natural join department where credits = 4;

Biology

Comp. Sci.

Physics

1. How many B grades have been given to physics majors?

select count(grade) from student natural join takes where dept\_name ='Physics' and grade = 'B';

1

1. What is the average total credits of students who have taken CS-319?

select avg(tot\_cred) from student natural join takes natural join course where course\_id='CS-319'

58.0

1. What is the average total credits of students who have taken CS-101?

select avg(tot\_cred) from student natural join takes natural join course where course\_id='CS-101'

1. What are the course IDs of courses taught by instructor Katz?

Select course\_id from course natural join teaches natural join instructor where instructor.name = 'Katz';

CS-101

CS-319

1. What are the course IDs of all courses offered by instructor Crick's department?

select course\_id from course natural join teaches natural join instructor where instructor.dept\_name = (select dept\_name from instructor where instructor.name = 'Crick');

Extra Credit:

What is the course\_id, semester, and year of sections of computer science courses?

select course\_id,semester,year from department natural join section natural join course where dept\_name = “Computer Science”;