# CISC 7510X Midterm Exam

For the below questions, use the following schema definition.

```
book(isbn,title,subject)
indvdl(iid,fname,lname,dob)
bkauthr(isbn,iid)
liblog(logid,evttype,isbn,iid,ts)
```

This is a schema for a library. The `book` table info on books. The `indvdl` table has all the indivudals, such as book borrowers and book authrors. The `bkauthr` table links `indvdl` authors to `book` records. The `liblog` has the log of book transactions. For example:

```
liblog(1,evttype=N,isbn=123456789,iid=NULL,ts=2012-01-02 08:01:00)  // new book
liblog(2,evttype=B,isbn=123456789,iid=2,ts=2013-03-27 08:01:00)     // book borrowed
liblog(3,evttype=R,isbn=123456789,iid=2,ts=2013-04-07 14:01:00)     // book returned
liblog(2,evttype=X,isbn=123456789,iid=NULL,ts=2006-12-31 08:01:00)  // book destroyed
```

In other words, for `evttype`, N=new book, B=borrow, R=return, and X=book destroyed. Note that `book` table doesn't tell you what books are available in the library, you need to consult the `liblog` table for that.

Pick the best answer that fits the question. Not all of the answers may be correct. If none of the answers fit, write your own answer. There are at most 2 questions where writing your own answer may be appropriate.

1. (5 points) Find ISBN number of a book Catch 22.

    (a) select title from book where upper(title)='CATCH 22';

    (b) select isbn from book where upper(title)='CATCH 22';

    (c) select isbn from bkauthor where upper(title)='CATCH 22';

    (d) select isbn from liblog where upper(title)='CATCH 22';

    (e) Other:

2. (5 points) How many books have "computer" in their title?

    (a) select group by count(*) from book where upper(title) like '%COMPUTER%';

    (b) select title,count(*) from book where upper(title) like '%COMPUTER%' group by title;

    (c) select count(*) from book where upper(title) like '%COMPUTER%';

    (d) select sum(1)/count(*) from book where upper(title) like '%COMPUTER%';

    (e) Other:

3. (5 points) Find author of 'Catch 22'

    (a) select fname,lname from book where upper(a.title)='CATCH 22'

    (b) select b.fname,b.lname from book a inner join bkauthr b where upper(a.title)='CATCH 22'

    (c) select c.fname,c.lname from book a inner join bkauthr b on a.iid = b.iid inner join indvdl c on b.isbn=c.isbn where upper(a.title)='CATCH 22'

(d) select c.fname,c.lname from book a inner join bkauthr b on a.isbn = b.isbn inner join indvdl c on b.iid=c.iid where upper(a.title)='CATCH 22'

(e) Other:

4. (5 points) Find average age of individuals with first name "Jack".

(a) select avg(cast(to_char(now()-dob,'YYYY') as int)) from indvdl where fname='Jack';

(b) select avg(dob) from indvdl where fname='Jack';

(c) select avg(age) from indvdl where fname='Jack';

(d) select avg(cast(age as int)) from indvdl where fname='Jack';

(e) Other:

5. (5 points) Create `authors` table that will only have book authors.

(a) create table authors as select * from indvdl where author is true;

(b) create table authors as select distinct c.* from book a inner join bkauthr b on a.isbn = b.isbn inner join indvdl c on b.iid=c.iid;

(c) create table authors as select * bkauthr;

(d) create table authors as select c.* from book a inner join bkauthr b on a.isbn = b.isbn inner join indvdl c on b.iid=c.iid;

(e) Other:

6. (5 points) Find average age of a book author.

(a) select avg(cast(to_char(now()-dob,'YYYY') as int)) from book a inner join bkauthr b on a.isbn = b.isbn inner join indvdl c on b.iid=c.iid;

(b) select avg(age) from book a inner join bkauthr b on a.isbn = b.isbn inner join indvdl c on b.iid=c.iid;

(c) select avg(dob) from authors;

(d) select avg(cast(to_char(now()-dob,'YYYY') as int)) from authors;

(e) Other:

7. (5 points) Find all books without an author.

(a) select a.isbn from book a inner join bkauthr b on a.isbn = b.isbn where b.isbn is null;

(b) select a.isbn from book a left outer join bkauthr b on a.isbn = b.isbn where b.isbn is null;

(c) select a.isbn from book a left outer join bkauthr b on a.isbn = b.isbn where a.isbn is null;

(d) select a.isbn from book a left outer join bkauthr b on a.isbn = b.isbn;

(e) Other:

8. (5 points) Find all books with more than 2 authors.

(a) select a.isbn from book a inner join bkauthr b on a.isbn = b.isbn and count(*)>2;

(b) select a.isbn from book a inner join bkauthr b on a.isbn = b.isbn having count(*)>2;

(c) select a.isbn from book a inner join bkauthr b group by a.isbn having count(*)>2;

(d) select a.isbn from book a inner join bkauthr b on a.isbn = b.isbn group by a.isbn having count(*)>2;

(e) Other:

9. (5 points) Find all books written by Mark Twain.

(a) select c.* from indvdl a inner join bkauthr b on a.iid=b.iid inner join book c on b.isbn=c.isbn where a.fname='Mark' and lname='Twain';

(b) select b.* from indvdl a inner join bkauthr b on a.iid=b.iid where a.fname='Mark' and lname='Twain';

(c) select a.* from indvdl a inner join bkauthr b on a.iid=b.iid inner join book c on b.isbn=c.isbn where a.fname='Mark' and lname='Twain';

(d) select c.* from indvdl a inner join book c on b.isbn=c.isbn where a.fname='Mark' and lname='Twain';

(e) Other:

10. (5 points) Find all books NOT written by anyone named "John".

(a) select a.isbn from book a left outer join bkauthr b on a.isbn=b.isbn left outer join indvdl c on b.iid=c.iid group by a.isbn having fname!='John' and lname!='John';

(b) select a.isbn from book a left outer join bkauthr b on a.isbn=b.isbn left outer join indvdl c on b.iid=c.iid group by a.isbn having coalesce(max(case when c.fname='John' then 1 else 0 end),0)=0;

(c) select a.isbn from book a left outer join bkauthr b on a.isbn=b.isbn left outer join indvdl c on b.iid=c.iid where fname!='John' and lname!='John';

(d) select a.* from book a left outer join bkauthr b on a.isbn=b.isbn left outer join indvdl c on b.iid=c.iid having coalesce(max(case when c.fname='John' then 1 else 0 end),0)=0;

(e) Other:

11. (5 points) What percentage of authors are named 'John'?

(a) select sum(case when fname='John' then 1.0 else 0.0 end)/sum(1.0)*100.0 prcnt from authors

(b) select percentage() from authors where fname='John'

(c) select sum(when fname='John' then 1 end)/sum(when fname!='John' then 1 end) from authors

(d) select percentage( sum(case when fname='John' then 1.0 else 0.0 end) ) from authors

(e) Other:

12. (5 points) What percentage of individuals (indvdl) in our database are book authors?

(a) select sum(case when author=true then 1.0 else 0.0 end)/sum(1.0)*100.0 prcnt from indvdl a

(b) select sum(case when b.iid is null then 1.0 else 0.0 end)/sum(1.0)*100.0 prcnt from indvdl a left outer join authors b on a.iid=b.iid

(c) select percentage(author='Y') prcnt from indvdl a left outer join authors b on a.iid=b.iid

(d) select sum(case when b.iid is not null then 1.0 else 0.0 end)/sum(1.0)*100.0 prcnt from indvdl a left outer join authors b on a.iid=b.iid

(e) Other:

13. (5 points) Authors who have ever borrowed their own book.

(a) select b.iid from book a inner join author b on a.isbn=b.isbn

(b) select b.iid from book a inner join liblog b on b.isbn=c.isbn and b.iid=a.iid where b.evttype='B'

(c) select b.iid from book a inner join bkauthr b on a.isbn=b.isbn inner join liblog c on b.isbn=c.isbn and b.iid=c.iid where c.evttype='B'

(d) select max(b.iid) from book a inner join liblog c on a.isbn=c.isbn and a.iid=c.iid where c.evttype='B'

(e) Other:

14. (5 points) How many books does the library have?

(a) select sum(case when evttype='N' then 1 when evttype='X' then -1 else 0 end) from liblog

(b) select count(*) from books

(c) select count(*) from liblog where evttype='N'

(d) select sum(case when evttype='N' then 1.0 end) from liblog

(e) Other:

15. (5 points) How many copies of 'Catch 22' are in the library?

(a) select count(*) from book where title='CATCH 22'

(b) select sum(case when evttype='N' then 1 when evttype='X' then -1 else 0 end) from liblog a inner join book b on a.isbn=b.isbn where upper(b.title)='CATCH 22'

(c) select count(distinct isbn) from book where title='CATCH 22'

(d) select sum(case when evttype='N' then 1 when evttype='X' then -1 else 0 end) from liblog a having upper(b.title)='CATCH 22'

(e) Other:

16. (5 points) What's the most popular book (borrowed most often) in the library?

(a) select title from book where max(borrowed) = count(*)

(b) select max(title) from liblog where evttype='B' having count(*) = max(count(*))

(c) with allcnts as (select * from liblog where evttype='B'), maxcnt as (select max(count(*)) mc from allcnts) select a.isbn from allcnts a inner join maxcnt b on a.cnt=b.mc;

(d) with allcnts as (select isbn,count(*) cnt from liblog where evttype='B' group by isbn), maxcnt as (select max(cnt) mc from allcnts) select a.isbn from allcnts a inner join maxcnt b on a.cnt=b.mc;

(e) Other:

17. (5 points) Who borrows the most books?

(a) select count(*) from individual where borrower = max(borrower);

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(b) with allcnts as (select iid,count(*) cnt from liblog where evttype='B' group by iid), maxcnt as (select max(cnt) mc from allcnts) select a.iid from allcnts a inner join maxcnt b on a.cnt=b.mc;

(c) select max(count(*)) from liblog group by iid;

(d) select iid from (select count(*) from liblog group by iid) a where cnt=max(count(*))

(e) Other:

18. (5 points) Who has the most unreturned books?

(a) with unreturned as (select sum(unreturned) cnt from liblog where evttype in ('N') ), maxcnt as (select max(cnt) mc from allcnts) select a.iid from allcnts a inner join maxcnt b on a.cnt=b.mc;

(b) with counts as (select count(*) cnt from liblog where evttype='R' group by iid), maxcnt as (select sum(cnt) mc from allcnts) select a.iid from allcnts a inner join maxcnt b on a.cnt=b.mc;

(c) with allcnts as (select iid,sum(case when evttype='B' then 1 when evttype='R' then -1 end) cnt from liblog where evttype not in ('N','X') group by iid), maxcnt as (select max(cnt) mc from allcnts) select a.iid from allcnts a inner join maxcnt b on a.cnt=b.mc;

(d) with allcnts as (select iid,count(case when evttype='B' then 1 when evttype='R' then -1 end) cnt from liblog where evttype not in ('N','X') group by iid), maxcnt as (select sum(cnt) mc from allcnts) select a.iid from allcnts a inner join maxcnt b on a.cnt=b.mc;

(e) Other:

19. (5 points) Is is there a copy of 'CATCH 22' available to borrow right now?

(a) select case when sum(case when evttype='RETURNED' then -1 when evttype='BORROWED' then 1 end) > 0 then 'AVAILABLE' else 'NOT AVAILABLE' end from liblog a where upper(a.title)='CATCH 22';

(d) select case when sum(case when evttype in ('B') then -1 when evttype in ('N') then 1 end) > 0 then 'AVAILABLE' else 'NOT AVAILABLE' end from liblog a inner join book b on a.isbn=b.isbn where upper(b.title)='CATCH 22';

(c) select count(available) from liblog where upper(b.title)='CATCH 22';

(d) select case when sum(case when evttype in ('B','X') then -1 when evttype in ('R','N') then 1 end) > 0 then 'AVAILABLE' else 'NOT AVAILABLE' end from liblog a inner join book b on a.isbn=b.isbn where upper(b.title)='CATCH 22';

(e) Other:

20. (5 points) Who has 'CATCH 22' borrowed right now?

(a) select a.iid from liblog a inner join book b on a.isbn=b.isbn where upper(b.title)='CATCH 22' group by a.isbn,a.iid having sum(case when evttype='B' then 1 when evttype='R' then -1 end) != 0;

(b) select a.iid from liblog a where upper(a.title)='CATCH 22';

(c) select a.iid from liblog a inner join book b on a.isbn=b.isbn where upper(b.title)='CATCH 22';

(d) select a.iid from liblog a inner join book b on a.isbn=b.isbn where upper(b.title)='CATCH 22' group by a.isbn,a.iid having count(*) == 0;

(e) Other: