

Print Name _____

Signature _____ (pledged)

Cross-Join Queries & Indexing

UniversityLibrary Database

Individual Assignment

20 Points

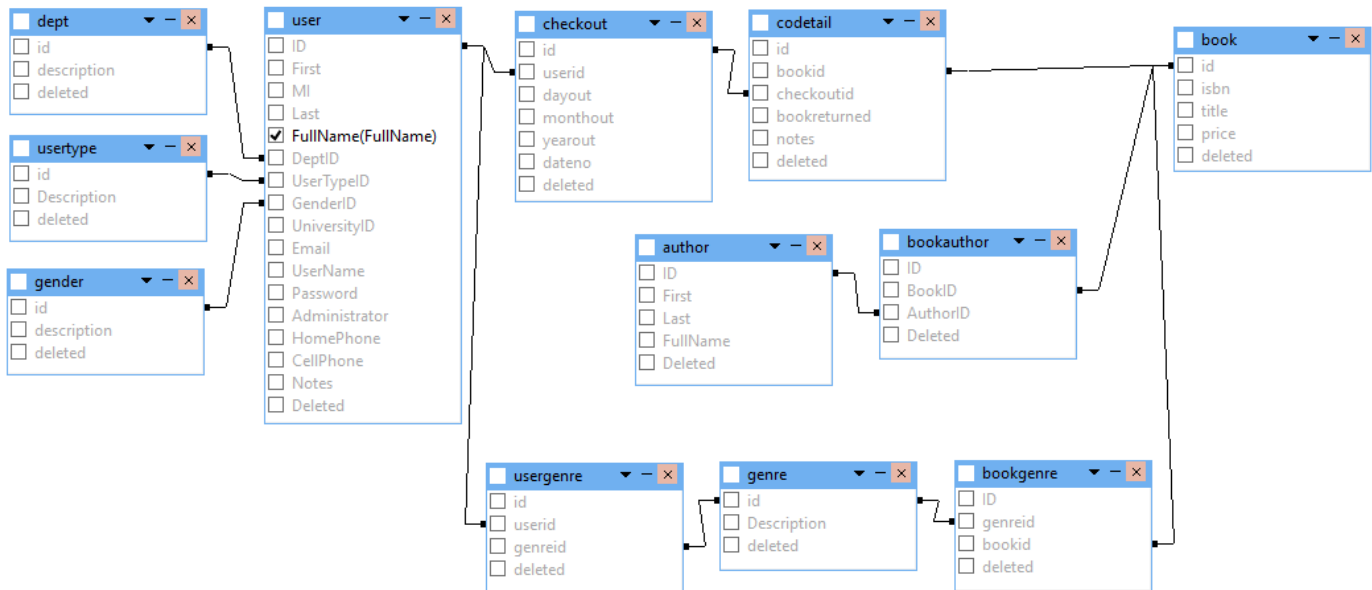
1 2 3
4 5 6 TABLE X

9 8
7 6
5 4 TABLE Y

1] Show the results of $X * Y$

UniversityLibrary Database View

Important → Import UniversityLibrary3.sql



- 2] Create an alphabetical listing of all the users who are Faculty. Your query must yield the following results (including labels). Copy/Paste your solution below the Graphic.

User.ID	FullName	User Type	Gender
69	Fogarty, Seth D	Faculty	Male
70	Hibbs, Matt E	Faculty	Male
31	Hicks, Tom E	Faculty	Male
45	Lewis, Mark W	Faculty	Male
64	Myers, Paul R	Faculty	Male
71	Zhang, Yu R	Faculty	Female

- 3] Create an alphabetical listing of all the valid users who are Female and Computer Science Majors. Your query must yield the following results (including labels). Copy/Paste your solution below the Graphic.

User.ID	First	Last	User.Deleted	Dept.ID	Dept Name	Gender
3	Madison	Cox	F	1	Computer Science	Female
7	Caroline	Haggard	F	1	Computer Science	Female
9	Morgan	King	F	1	Computer Science	Female
12	Monica	Lampton	F	1	Computer Science	Female
14	Reanna	Lauritsen	F	1	Computer Science	Female
21	Nina	Odegard	F	1	Computer Science	Female
29	Cristina	Trevino	F	1	Computer Science	Female

- 4] Create a display of all of the information about the most expensive book. Your query must yield the following results (including labels). Copy/Paste your solution below the Graphic.

id	title	author	price	deleted
100	Data Communications and Networking	Forouzan	209.99	F

- 5] Create a display that displays an alphabetical listing of the Genre ID, Genre, Title, and Price associated with the most expensive book. Your query must yield the following results (including labels). Copy/Paste your solution below the Graphic. Your query must work when a book costing more than \$210 is added to the collection of books.

Genre.ID	Genre	Title	Price
180	Computer Science	Data Communications and Networking	209.99
202	Computer Security	Data Communications and Networking	209.99
184	Networking	Data Communications and Networking	209.99

- 6] Create a display that contains the FullName, Gender, Check Out Date, and Book Title for the last 10 check-out transactions by 'Hicks, Tom E' ← Most recent at the top. Your query must yield the following results (including labels – all of the labels require AS). Copy/Paste your solution below the Graphic.

Full Name	Gender	Check Out Date	Book Title
Hicks, Tom E	Male	12/22/2018	Quantum Mechanics
Hicks, Tom E	Male	12/22/2018	Biology
Hicks, Tom E	Male	12/22/2018	Computer Organization and Design
Hicks, Tom E	Male	12/22/2018	Optics
Hicks, Tom E	Male	12/22/2018	A First Course in Partial Differential Equations
Hicks, Tom E	Male	12/22/2018	Data Communications and Networking
Hicks, Tom E	Male	12/22/2018	A Transition to Advanced Math
Hicks, Tom E	Male	12/22/2018	A First Course in Partial Differential Equations
Hicks, Tom E	Male	12/22/2018	Testing Computer Software
Hicks, Tom E	Male	12/22/2018	Software Testing Foundations, 4th Edition: A Study Guide for the Certified Tester Exam

id	Description	deleted
1	--- All Genre ---	F
2	-- Select Genre --	F
3	Adventure	F
4	African American Interest	F
5	Animals	F
6	Anthology	F
7	Art	F
8	Art History	F
9	Autobiography	F

- 7] The table above shows the first few items in the Genre table; check it out on your database. Suppose we would like to do a query for a ComboBox in which the user has an opportunity to choose a Genre in Add/Edit modes; we would like to have the choices alphabetical with - - **Select Genre** - - being at the top. Write the Query that would make this happen. - - **All Genre** - - should not be in the list of choices.

- 8] The table above shows the first few items in the Genre table; check it out on your database. Suppose we would like to do a query for a ComboBox that would make a nice select filter in the navigation panel; we would like to have the choices alphabetical with -- **All Genre** -- being at the top. Write the Query that would make this happen. -- **Select Genre** -- should not be in the list of choices.

B+ Tree

Assume $M = 7001$ $\text{sizeof(InfoType)} = 7,996$ Bytes $\text{sizeof(Key)} = 8$ Bytes $\text{sizeof(Buffer)} = 163,840$

Show All Calculations Show All Calculations – (Where Appropriate!)

- 1] _____ This B+ Tree node has the capacity to hold ? KeySets?
- 2] _____ {T/F} The records in the B+Tree node will be sorted in ascending order.
- 3] _____ This B+Tree node will contain ? Pointers (to other B+Tree Nodes)?
- 4] _____ This B+Tree node will contain ? Actual Number Counter
- 5] _____ The Max KeySets that good be represented, on only Level 1 of this tree, would be ? . (Numerical Value not in terms of M)
- 6] _____ The Max KeySets that good be represented, on only Level 2 of this tree, would be ? . (Numerical Value not in terms of M)
- 7] _____ The Max KeySets that good be represented, on only Level 3 of this tree, would be ? .
- 8] _____ All B+Tree node will contain ? KeySets? (Express in terms of M)
- 9] _____ All B+Tree node will contain ? Pointers (Express in terms of M)?

B+ Tree - Buffering Scenario

Assume $M = ?$ $\text{sizeof}(\text{InfoType}) = 7,996$ Bytes $\text{sizeof}(\text{Key}) = 8$ Bytes $\text{sizeof}(\text{Buffer}) = 163,840$

- 1-10] _____ What would be the B+ Tree **optimal M** for the specified buffer? (Numerical Value not in terms of M) **SHOW YOUR WORK!**
- 11] _____ Based on the B+ Tree Optimal M above, the Max KeySets that could be placed in Level 1 is ? . (Numerical Value not in terms of M)
- 12] _____ Based on the B+ Tree Optimal M above, the number of searches to find any one of the records, whose key is in Level 1 of the B+ Tree, would require ? touches (R/Ws) of the hard drive.
- 13] _____ Based on the B+ Tree Optimal M above, the Maximum KeySets that could be placed in Level 2 is ? . (Numerical Value not in terms of M)
- 14] _____ Based on the B+ Tree Optimal M above, the Minimum KeySets that could be placed in Level 2 is ? . (Numerical Value not in terms of M)
- 15] _____ Based on the B+ Tree Optimal M above, the Average Number Of KeySets that would be placed in Level 2 is ? . (Numerical Value not in terms of M)
- 16] _____ Based on the B+ Tree Optimal M above, the Maximum KeySets that could be placed in Level 3 is ? . (Numerical Value not in terms of M)
- 17] _____ {T/F} If an Key is in the third level of this B+ Tree structure, it would take three touches of the hard drive to access the record associated with that key → Root Node is in memory → Read Second Level Node → Read the Third Level Node → Read the Record.

- 18] _____ {T/F} Assume that Dr. Hicks found out that the machines in our classroom could access approximately 400 records per second. If an Key is in the third level of this B+ Tree structure, it would take about .0075 sec to access our sought record.
- 19] _____ {T/F} As a general rule, we should index all items in a database table.
- 20] _____ As a general rule, we should index all fields associated with an O_?_ By.
- 21] _____ As a general rule, we should index all fields associated with Se_?_ Fi_?_.
- 22] _____ As a general rule, we should index all fields associated with repetitive queries in Se_?_ ; examine the WHERE clause carefully.
- 23] _____ As a general rule, we should index all fields associated Queries that we do repetitively – especially those used in Rep_?_.
- 24] _____ As a general rule, we should index all fields associated with queries used to fill Com_?_ controls.
- 25] _____ As a general rule, we should index all fields associated with both sides of the Re_?_ Sp_?_.
- 26-30] Write the MySQL query to create an index, called FullName.