CS 464/564 Spring 2021 Quiz 9 **Name:_____**

Use the Library database to answer the following questions.
Write relational algebra expressions to answer questions 1 and 2

1. Find the cid, first and last of customers who have borrowed a copy of a book titled Ada.

2. Find the booknum and title of books borrowed by all customers who have used library 10. The phrase "used library 10" means the customer has borrowed a copy of a book housed in library 10.

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3. Suppose the Book table contains 10,000 rows and there are 50 rows per page. Also suppose there are 101 main memory page buffers that can be used for sorting. How many secondary memory accesses (reads and writes) will be done in order to sort the Book table? Use the external sorting algorithm (i.e. partial sort then k-way merging) described in the lecture on external sorting.