Fall 2024 Midterm Test
Solutions V2
CSC 343 H1F
Duration: **90 minutes**

Question 1. [11 marks]

Consider the following schema, which represents libraries with books and clients who check out those books. For example, the tuple `<B1, L1, 'The Cat in the Hat'>` in Books and the tuple `<L1, 'Lillian H Smith'>` in Library means that the Lillian H Smith library has a copy of 'The Cat in the Hat'. The tuples `<B1, C1, 2023-03-14>` and `<B1, C2, 2024-07-22>` in Checkout represents two clients with IDs C1 and C2 who checked out that book.

Relations	**Integrity Constraints**
Library(<u>lID</u>, name)	1) Book[lID] $\subseteq$ Library[lID]
Book(<u>bID</u>, lID, title)	2) Checkout[bID] $\subseteq$ Book[bID]
Client(<u>cID</u>, name)	3) Checkout[cID] $\subseteq$ Client[cID]
Checkout(<u>bID, cID, date</u>)	

Part (a) [1 mark] Assume there are 5 tuples in Book. What are the minimum and maximum number of tuples that could be in Book $\bowtie$ Checkout? If no maximum, write ∞.

Min: 0 Max: ∞

Part (b) [1 mark] Assume there are 5 tuples in Checkout. What are the minimum and maximum