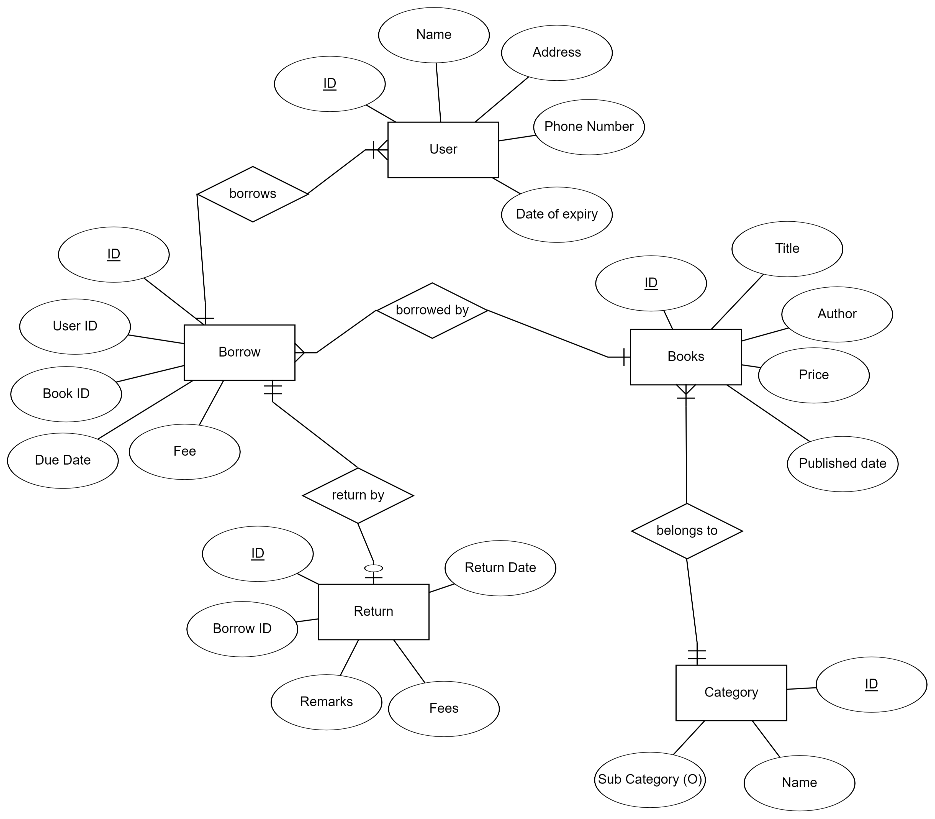
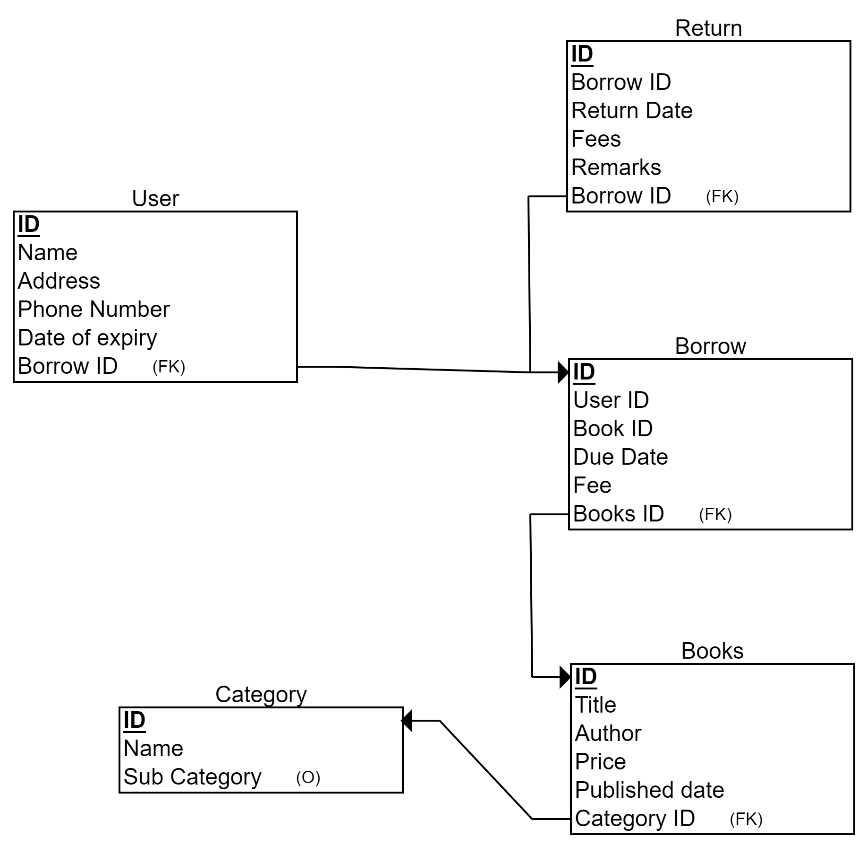
**Name: Adithya M SRN: PES1UG20CS621 Section: K  
DBT Assignment 1**

**ER Diagram:**

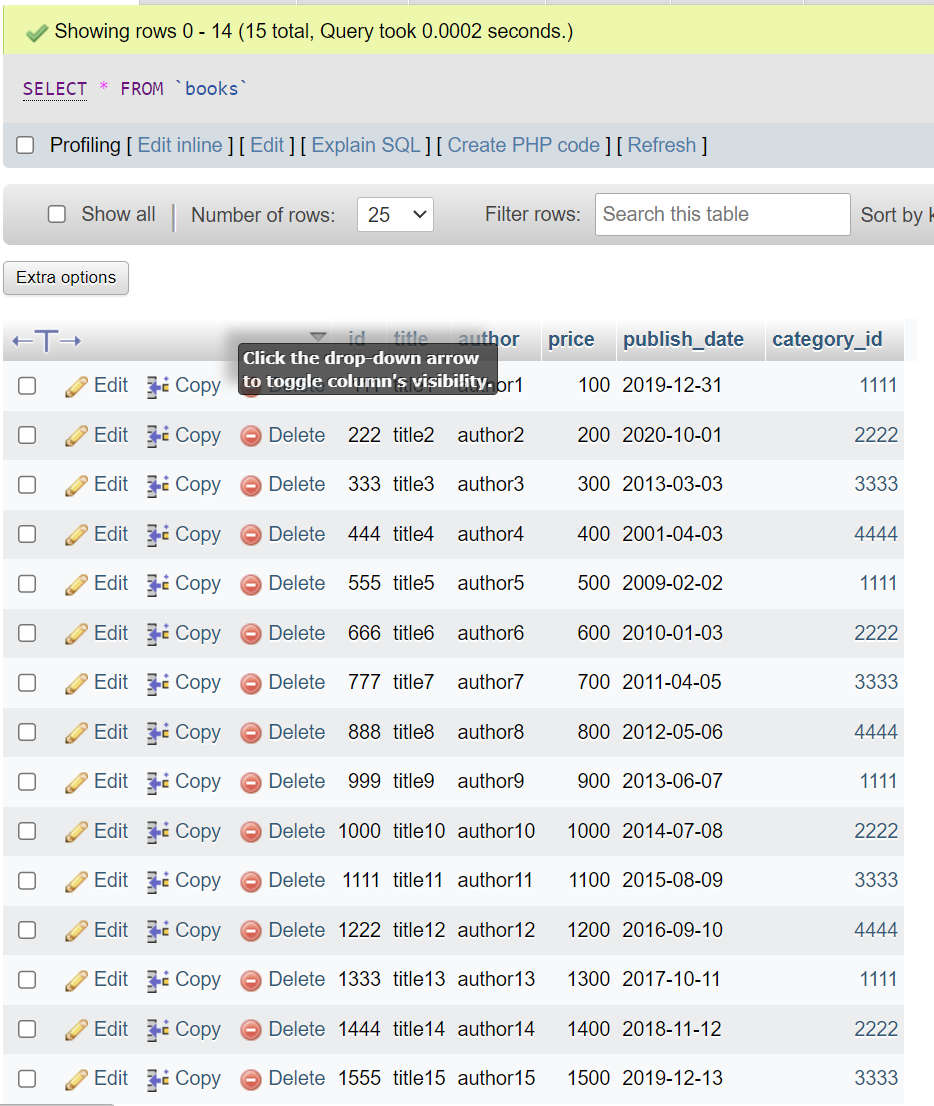
****

**Relational Schema:**

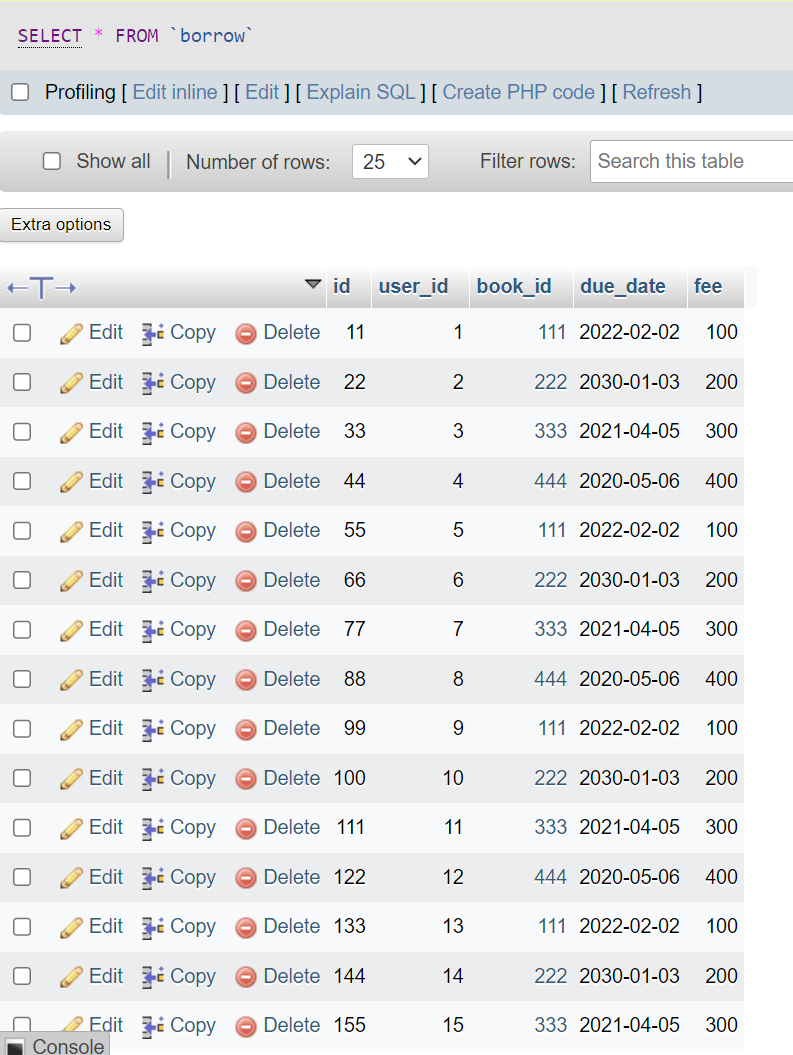
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**Tables**:

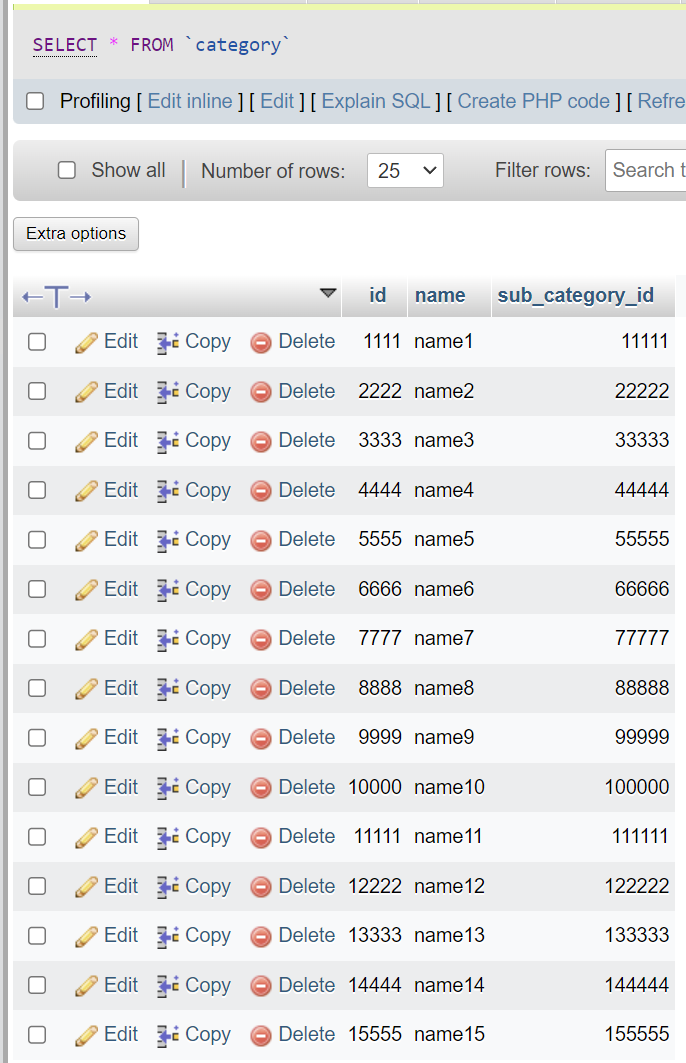
SELECT \* FROM books;



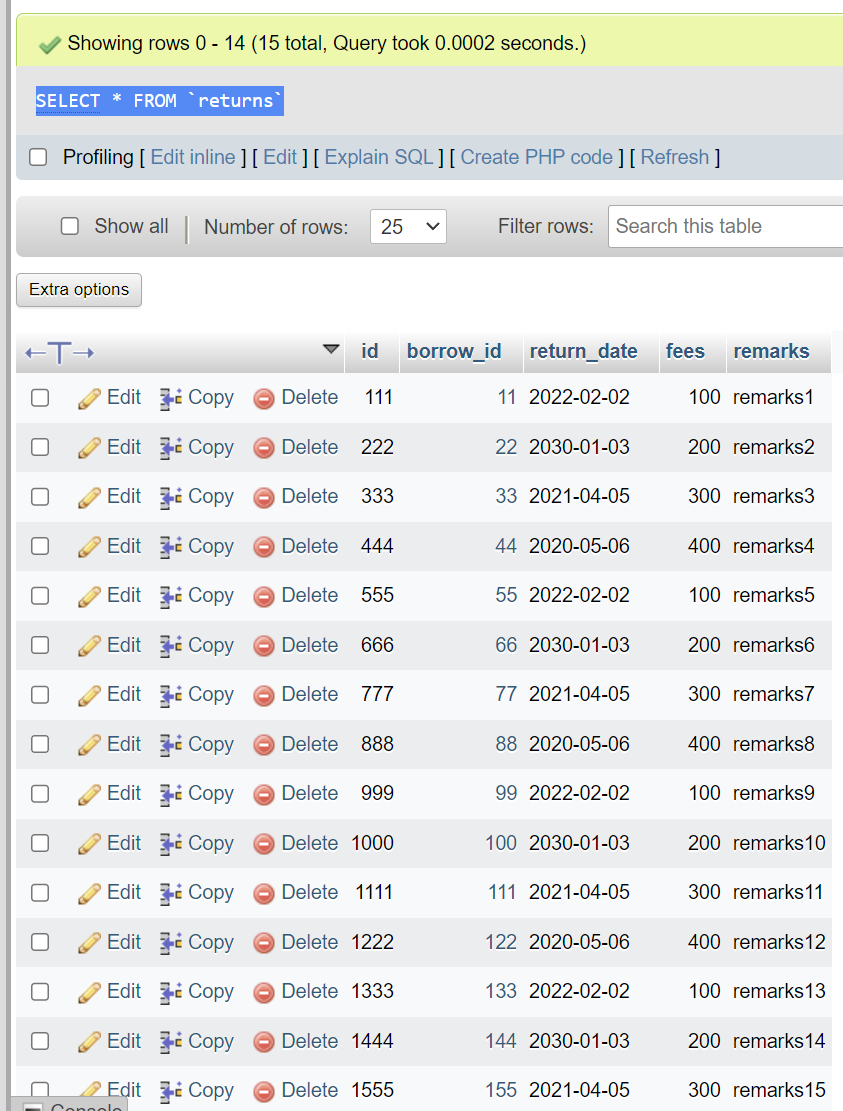
SELECT \* FROM borrow;



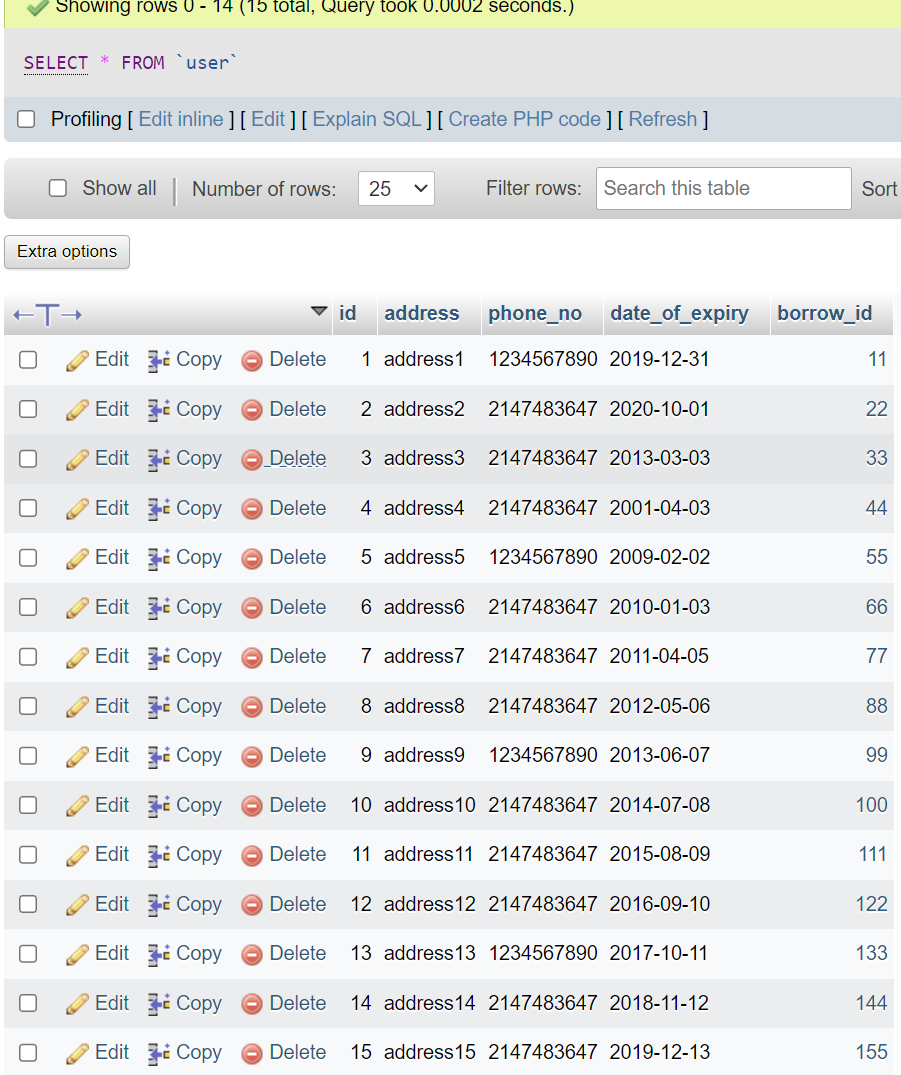
SELECT \* FROM category;



SELECT \* FROM returns;



SELECT \* FROM user;

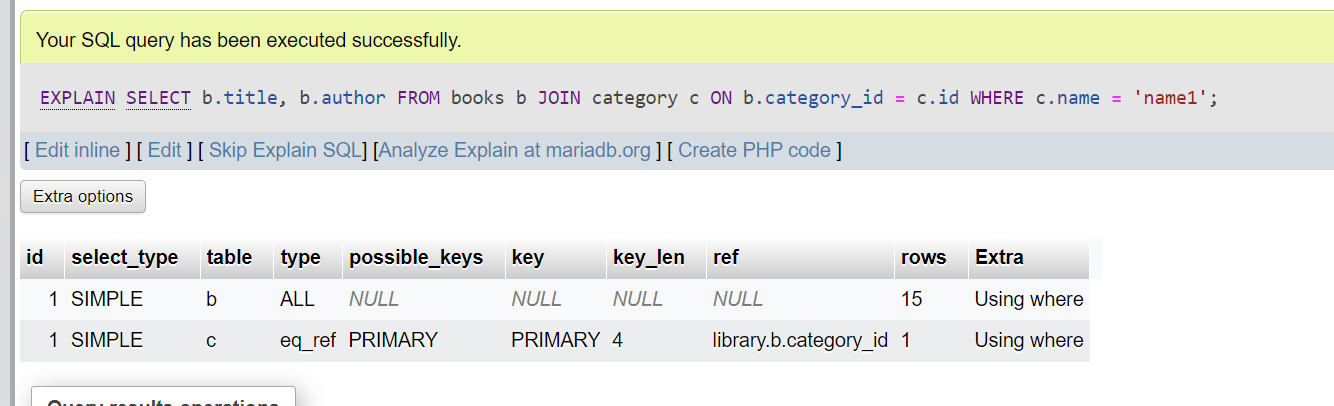


**Creating indices**

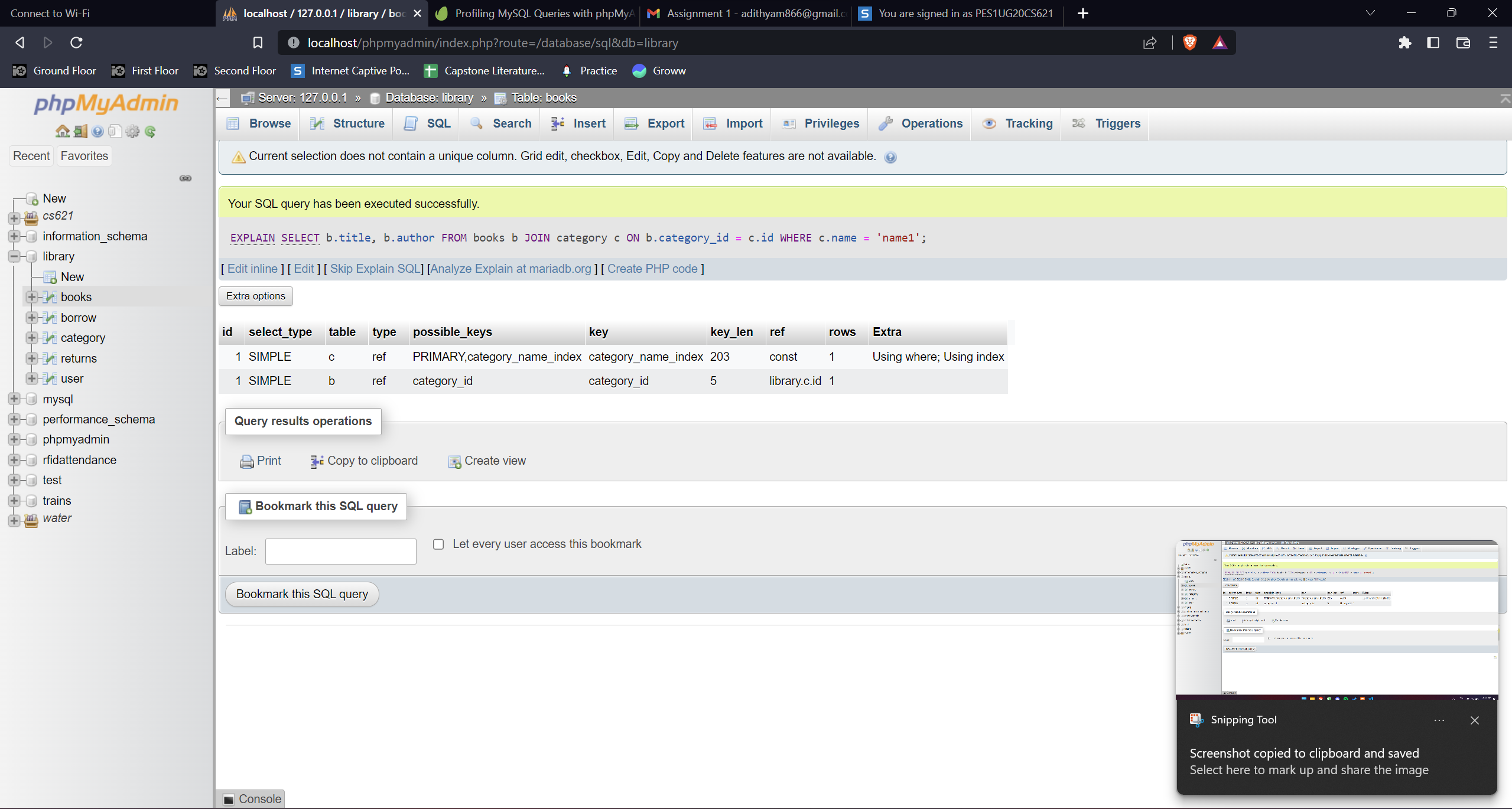


**Queries**  
1) SELECT b.title, b.author FROM books b JOIN category c ON b.category\_id = c.id WHERE c.name = 'name1';

Without index:

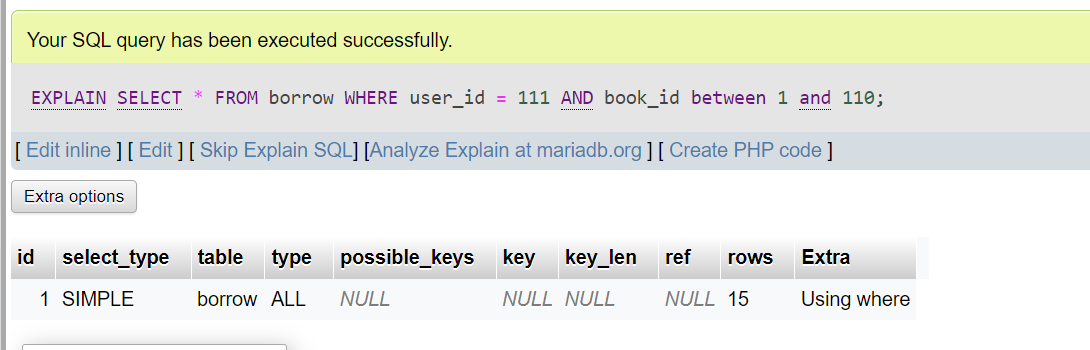


With Index:

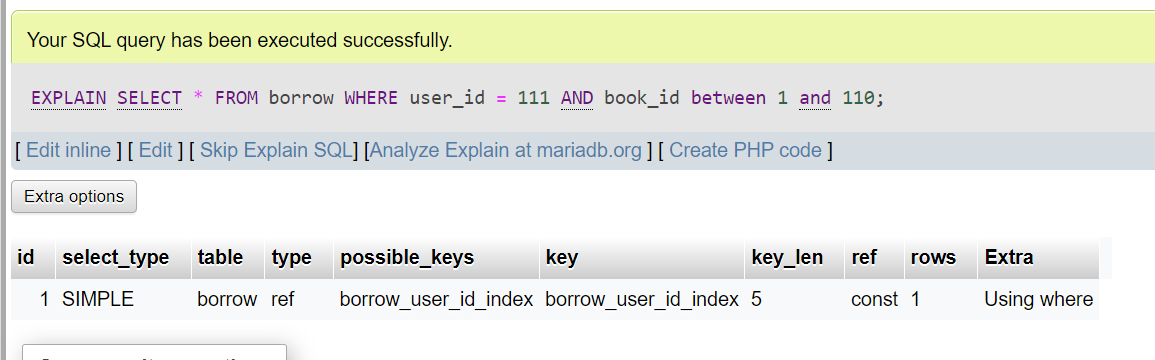


2) SELECT \* FROM borrow WHERE user\_id = 111 AND book\_id between 1 and 110;

Without index:

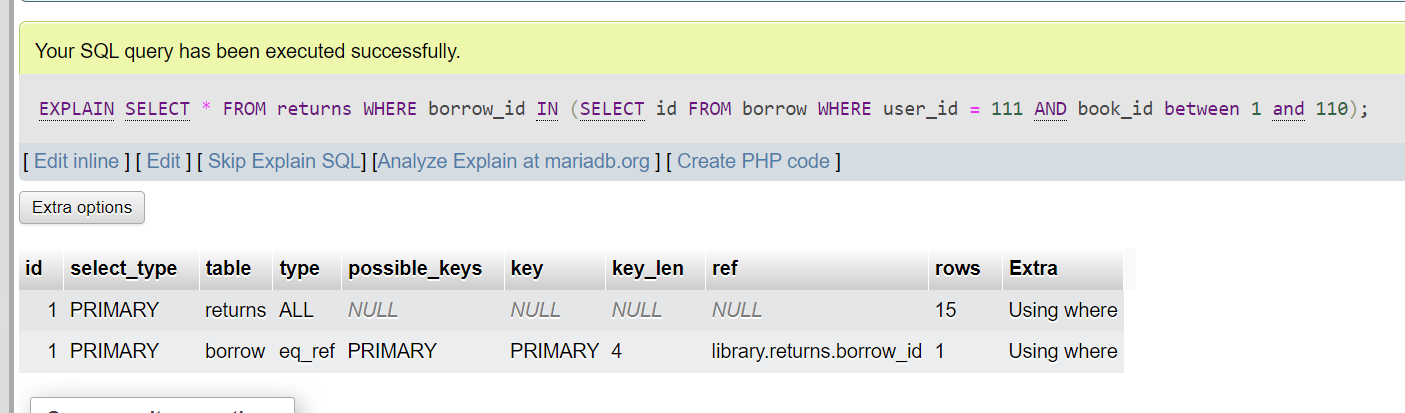


With index

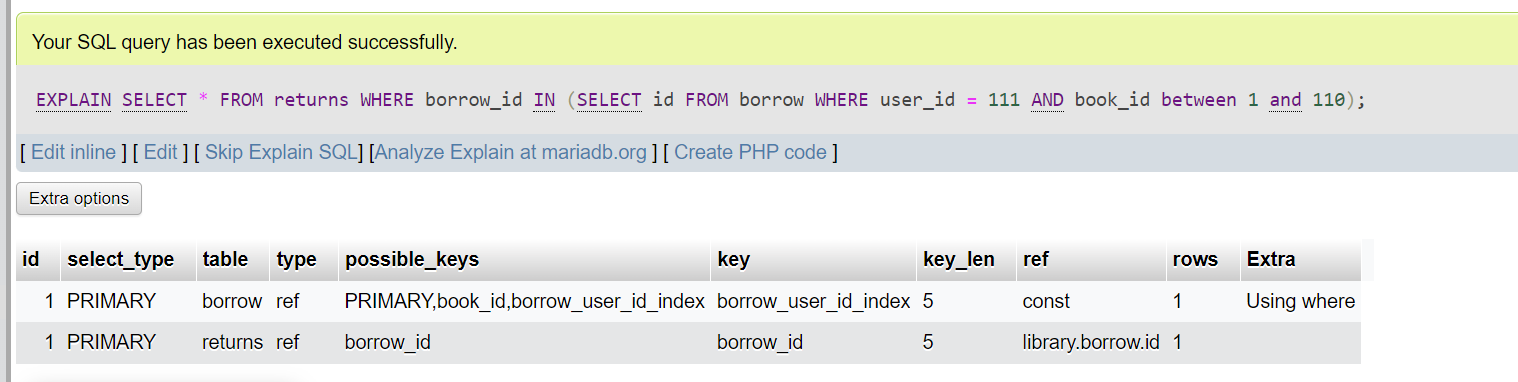


3) SELECT \* FROM returns WHERE borrow\_id IN (SELECT id FROM borrow WHERE user\_id = 111 AND book\_id between 1 and 110);

Without index:

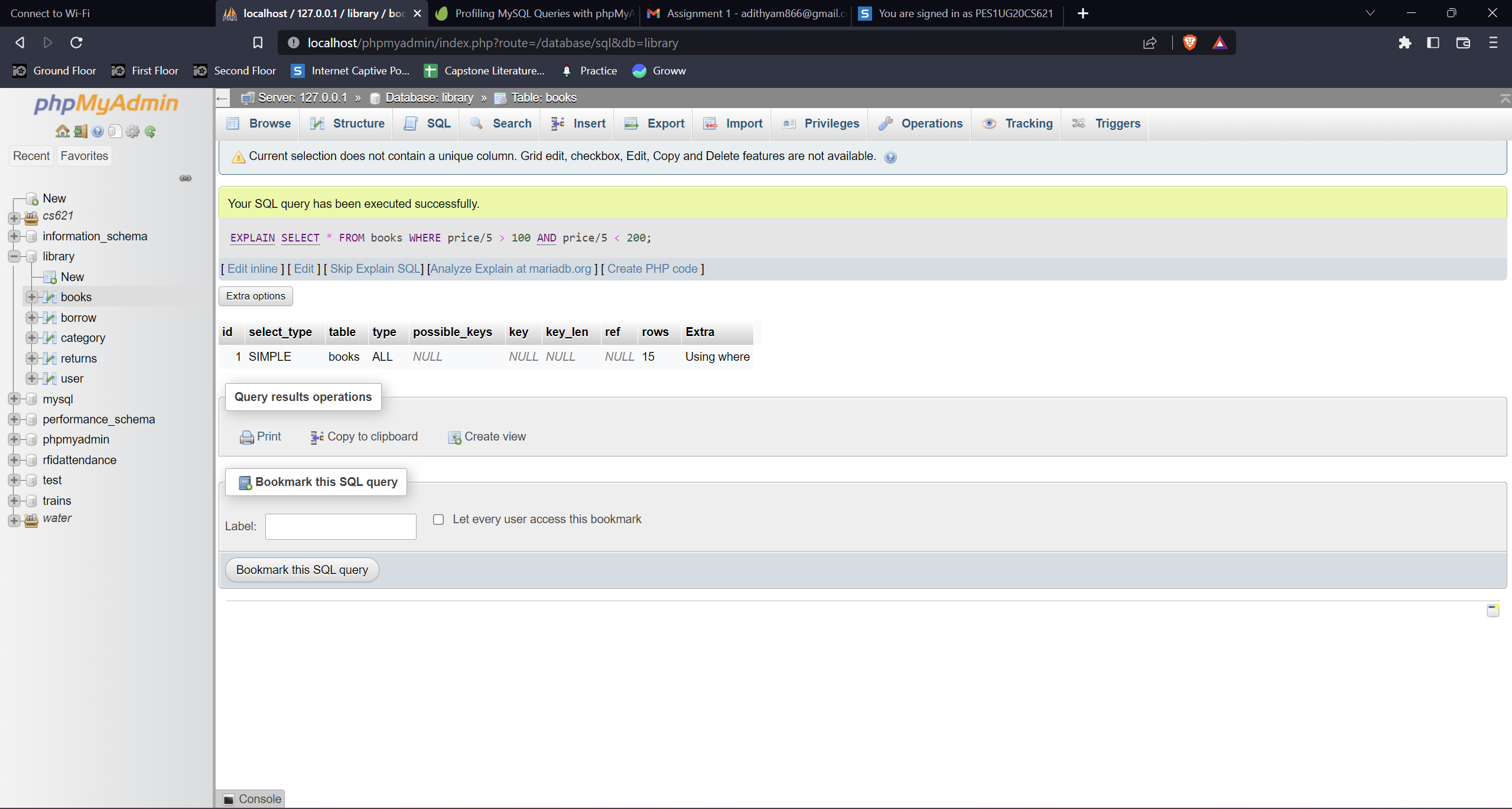


With index:



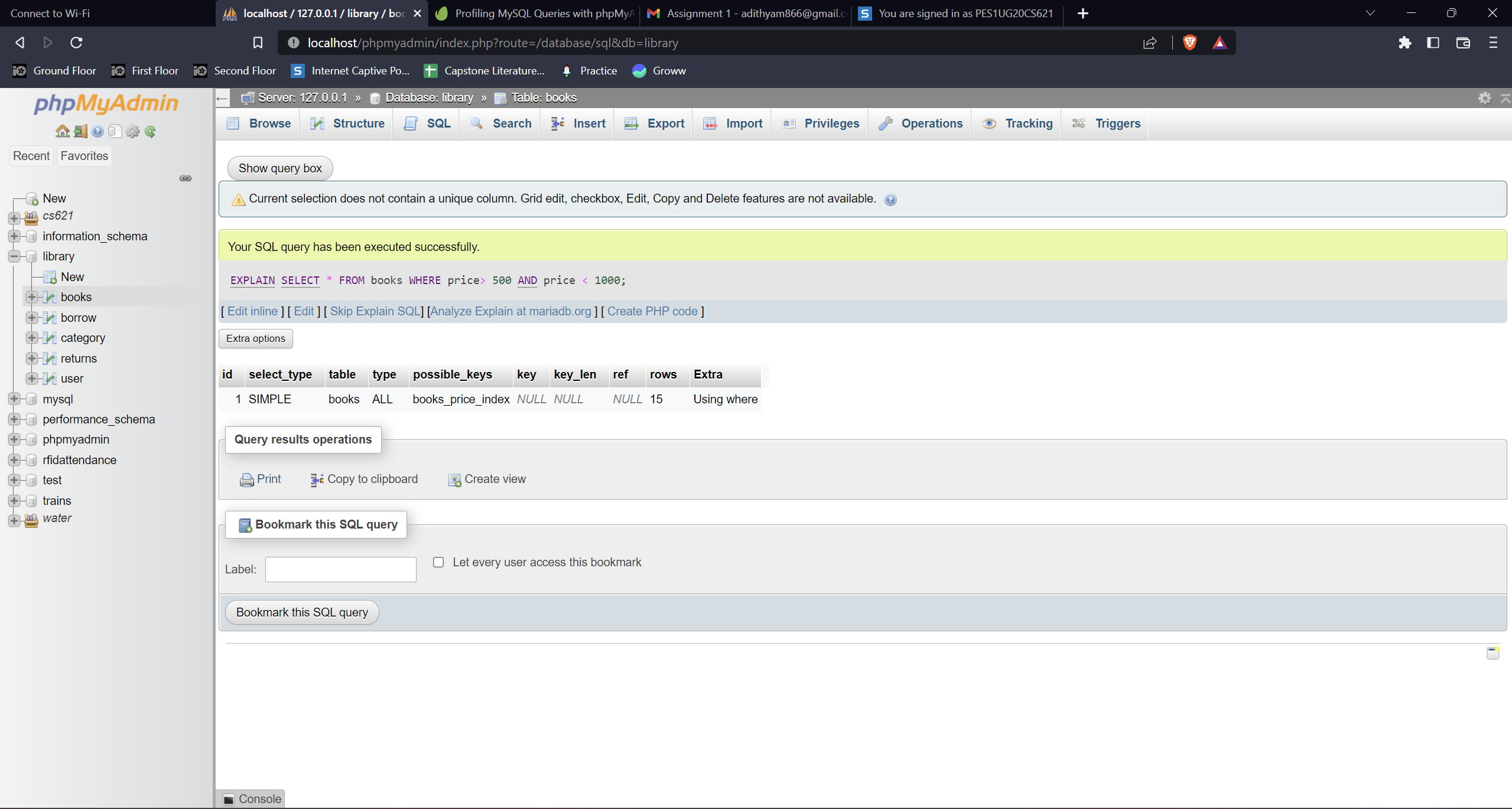
4) SELECT \* FROM books WHERE price/5 > 100 AND price/5 < 200;

Without optimization (index present):



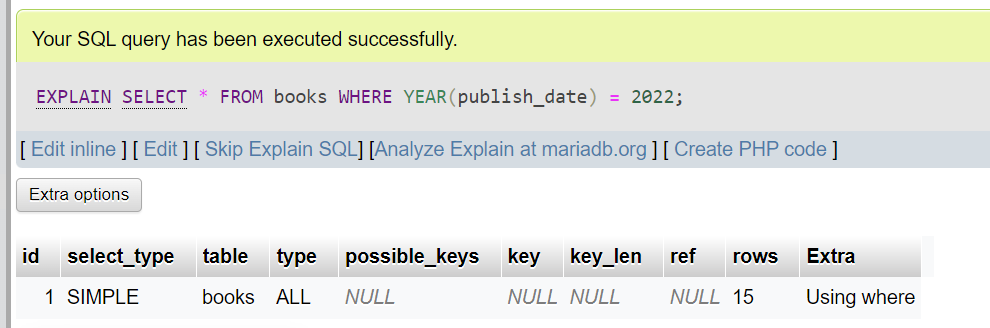
With optimization (index present):

SELECT \* FROM books WHERE price > 500 AND price < 1000;

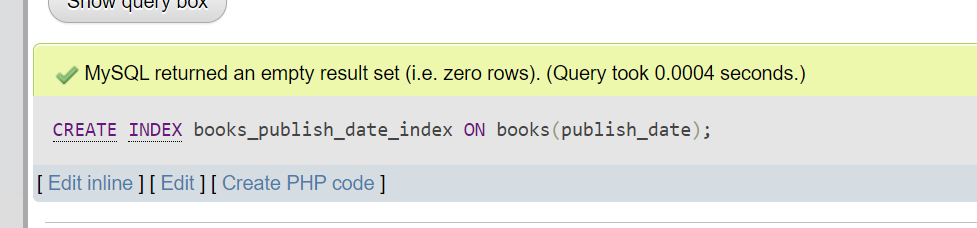


5) SELECT \* FROM books WHERE YEAR(publish\_date) = 2022;

Without index and optimisation:



Creating index: CREATE INDEX books\_publish\_date\_index ON books(publish\_date);



Optimised query: SELECT \* FROM books WHERE publish\_date >= '2022-01-01' AND publish\_date < '2023-01-01';

