**Database Systems**

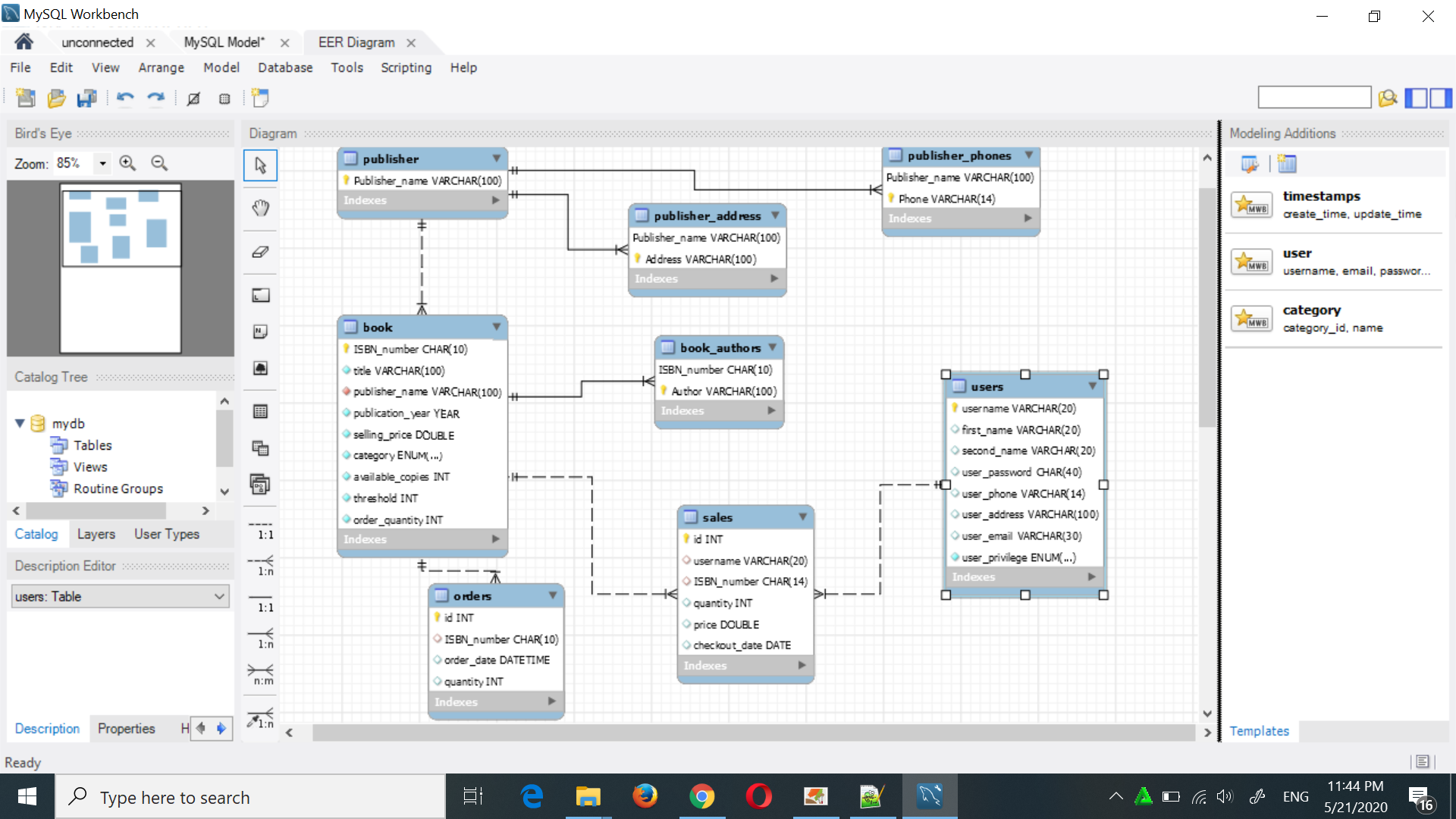
**Final Project**

**Order Processing System**

**Prepared by:**

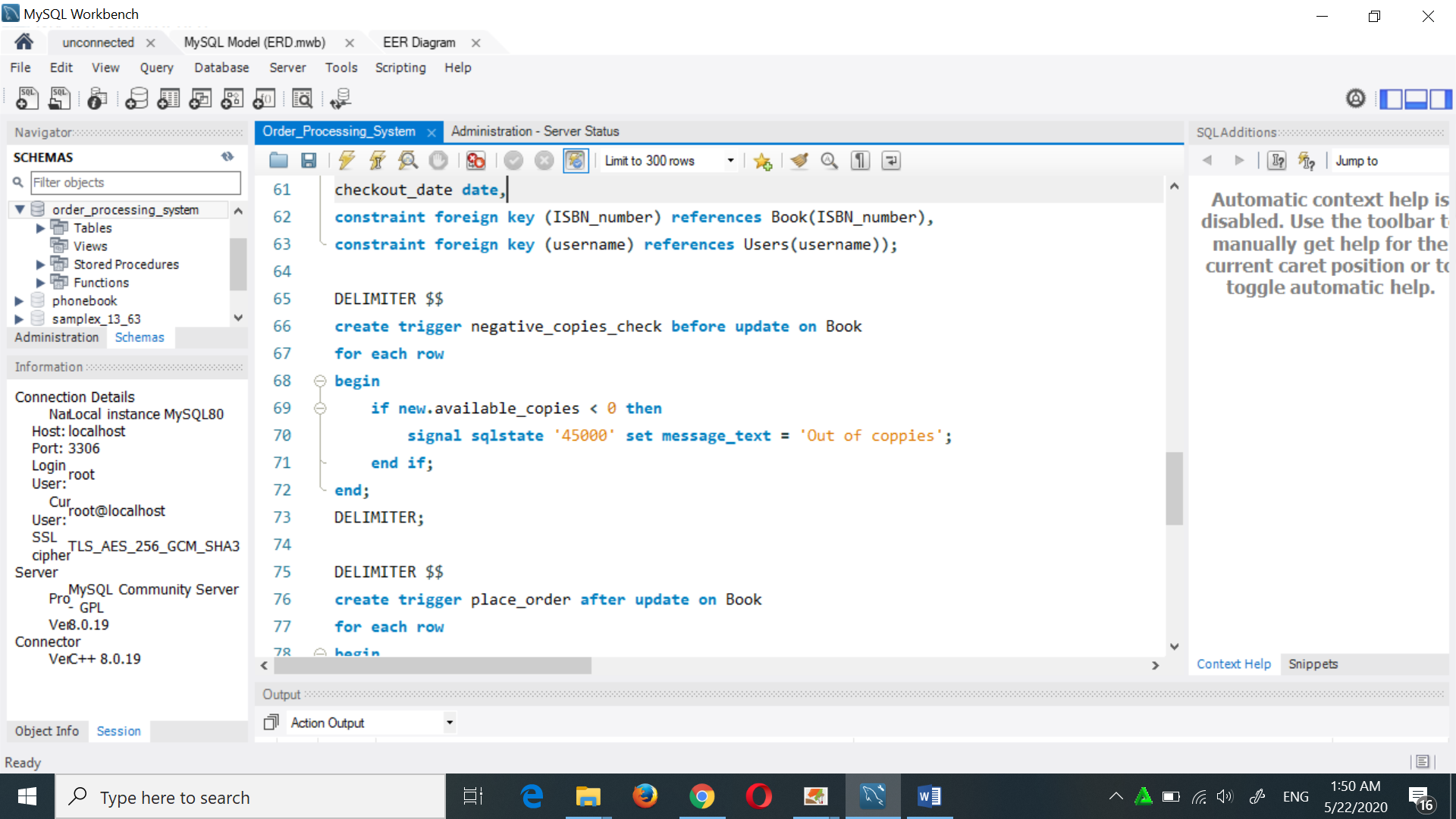
1. Eman Rafik ID: 13
2. Menna Osman ID: 55
3. Yomna Gamal ID: 63

* **Entity Relationship Diagram**

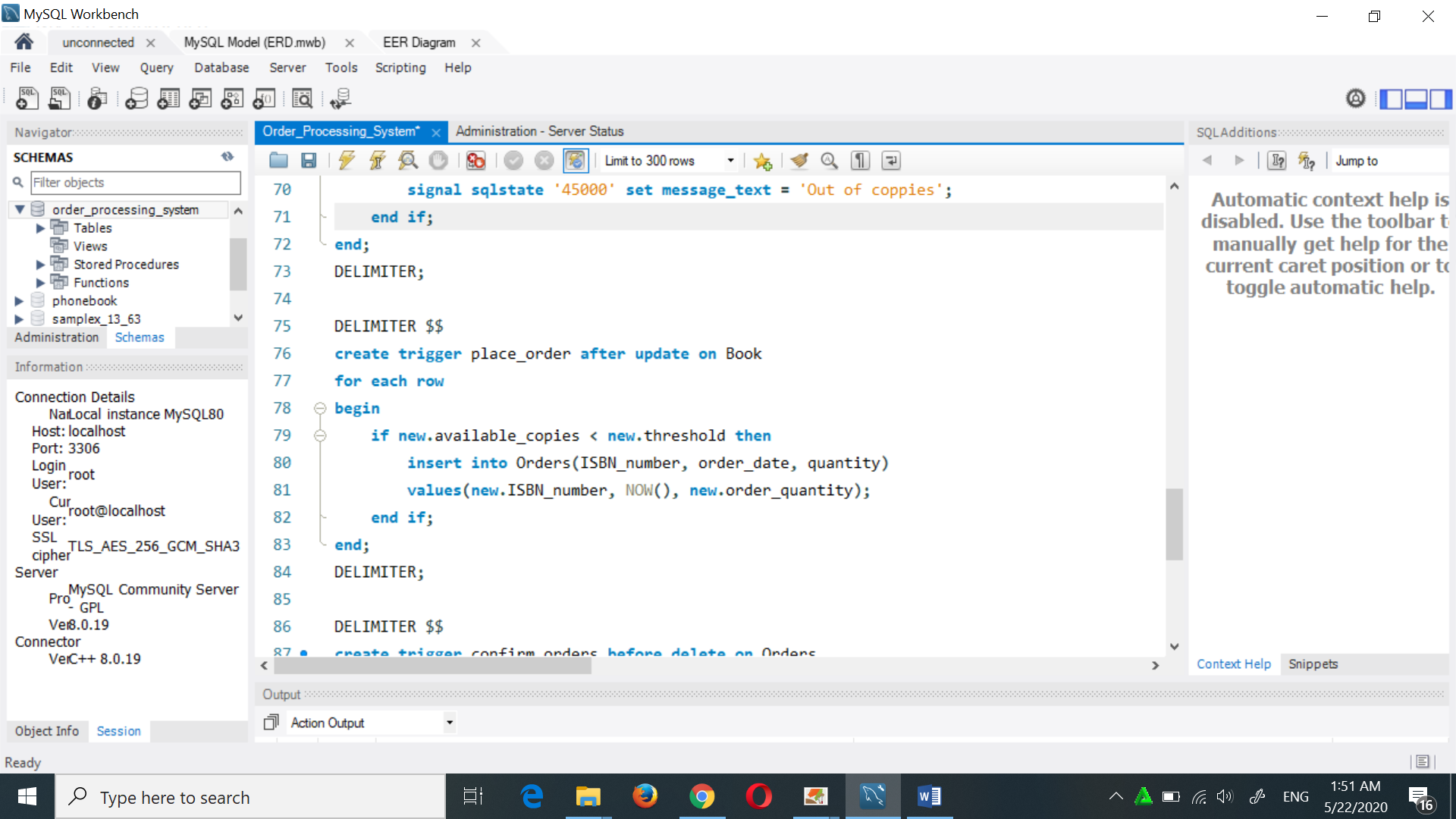


* **Triggers**

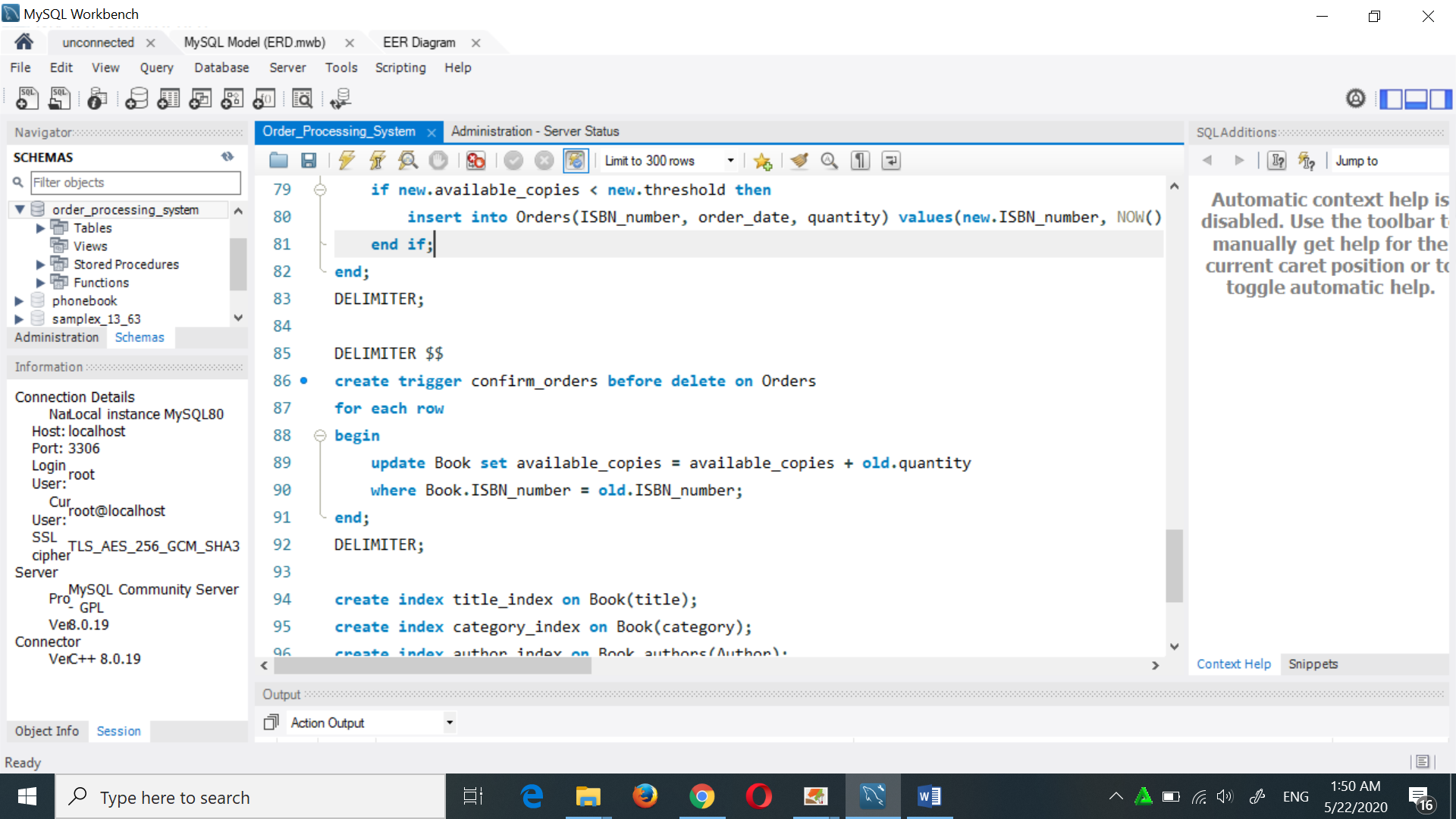
1. *negative\_copies\_check:* to ensure that number of available copies of a certain book never goes below 0, before updating the ‘Book’ relation.



1. *place\_order:* places a new order to the ‘Order’ relation when the number of available copies of a certain book drops down below its specified threshold on ipdating the ‘Book’ relation. The number of copies in the order is specified from the ‘Book’ relation (order\_quantity) attribute.



1. *confirm\_orders:* deletion of a record from the ‘Order’ relation indicates that this order has been received, so the quantityof books in the order are added to the available copies of the specified book.



* **Procedures**

1. *add\_order:* accepts two parameters, the book ISBN and the quantity of books to be ordered, then it creates a new order with the current timestamp and provided information. Called when a manager places new order for a book.
2. *add\_to sales:* accepts two parameters, the username and book ISBN, it adds a record in ‘Sales’ relation with the provided information, in addition to the current date and the current price of that book (the price might change), and with the default quantity ‘1’.

* **Indices**

1. Index on book title.
2. Index on book category.
3. Index on author name.

* **Transactions Control**

1. *Adding new book:*

On adding a new book, auto commit is set false, multiple insert queries are executed, one to insert a new record in the ‘Book’ relation and the others to insert a record for each author in the ‘Book\_Authors’ relation. The transaction is then committed, or it might be rolled back if any exception occurred and the book information are not inserted at all.

1. *Adding new publisher:*

Adding new publisher is also considered a transaction to execute an insertion in the ‘Publisher’ relation and insertions in both ‘Publisher\_phones’ and ‘publisher\_addresses’ relations to insert all provided information or insert nothing if an exception occurred and the transaction is rolled back.

1. *Checkout:*

When the user checkouts his shopping cart the auto commit is set false as this process is considered one transaction. The user either buys all the specified books successfully and the transaction is committed after performing all needed updates and insertions (updating ‘Book’ relation and inserting into ‘Sales’ relation) for each individual book. If any exception occurred or the library ran out of copies for a certain book the transaction is rolled back.