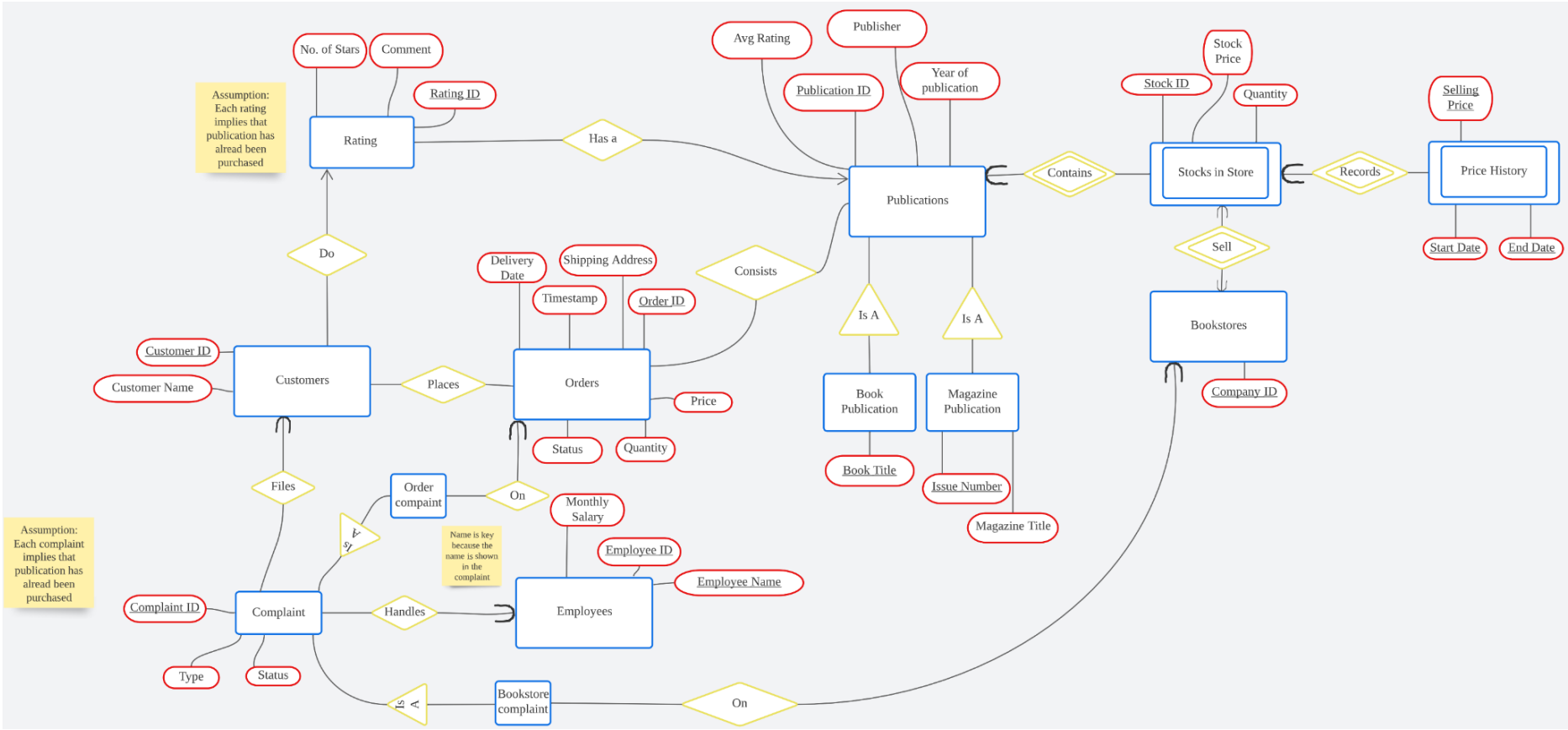
APPENDIX C: INDIVIDUAL CONTRIBUTION FORMAT

Full Name	**Individual Contribution to Lab 2**	**% of contribution**	**Signature**
Nalin Sharma	Normalisation Relations Schema	20%	
Lim Jia Earn	Normalisation Relations Schema	20%	
Jayden Yeo	Normalisation Relations Schema	20%	
Derrick Ng Choon Seng	Normalisation Relations Schema	20%	
Dexter Voon Kai Xian	Normalisation Relations Schema	20%	

ER Diagram:


No. of Stars
Comment
Rating ID
Rating
Assumption: Each rating implies that publication has alread been purchased
Has a
Avg Rating
Publisher
Publication ID
Year of publication
Publications
Contains
Stock ID
Stock Price
Quantity
Stocks in Store
Records
Selling Price
Price History
Start Date
End Date
Sell
Bookstores
Company ID
Do
Consists
Delivery Date
Shipping Address
Timestamp
Order ID
Is A
Is A
Customer ID
Customer Name
Customers
Places
Orders
Price
Status
Quantity
Book Publication
Book Title
Magazine Publication
Issue Number
Magazine Title
Files
Order compaint
On
Monthly Salary
Employee ID
Employee Name
Employees
Name is key because the name is shown in the complaint
Assumption: Each complaint implies that publication has alread been purchased
Complaint ID
Complaint
Handles
Type
Status
Is A
Bookstore complaint
On

Keys:

{ Publication_ID, Issue_Number, Employee_ID, Order_ID, Customer_ID, Rating_ID, Stock_ID, Complaint _ID }

Non-Trivial FDs:

1. Publication_ID → Avg_rating, Publisher, Year _of_publication
2. Publication_ID, Issue_Number → Magazine_Title
3. Employee_ID → Employee_Name, Monthly_salary
4. Order_ID → Delivery_date, Price, Quantity, Shipping_address, Order_status
5. Customer_ID → Customer_Name
6. Complaint_ID → Complaint_status, Type
7. Rating_ID → Comment, No_of_Stars
8. Publication_ID, Stock_ID → Quantity, Stock_Price
9. Publication_ID, Stock_ID, Start_Date, End_Date → Selling_price

Normalising our Relations Schema:

We will attempt BCNF (Boyce Codd Normal Form) decomposition, which is a stricter version of the 3NF (Third Normal Form) with every trivial dependency in a relation having its LHS attribute as the super key of the relation. If all functional dependencies are not preserved at the result, 3NF decomposition will be attempted instead.

R(Publication_ID, Issue_Number, Employee_ID, Order_ID, Customer_ID, Rating_ID, Stock_ID, Avg_rating, Publisher, Year _of_publication, Magazine_Title, Employee_Name, Monthly_salary, Delivery_date, Price, Shipping_address, Customer_Name, Order_status, Type, Complaint_status, Comment, No_of_Stars, Quantity, Stock_Price, Selling_price)

1) **Since FD 1 is a violation in BCNF:**

Closure of LHS of Publication_ID → Avg_rating, Publisher, Year _of_publication:
{Publication_ID}+ = {Publication_ID, Avg_rating, Publisher, Year _of_publication}

R1(Publication_ID, Avg_rating, Publisher, Year _of_publication) - in BCNF

Publication_ID	Publisher	Year _of_publication	Avg_rating

R2(Publication_ID, Issue_Number, Employee_ID, Order_ID, Customer_ID, Rating_ID, Stock_ID, Magazine_Title, Employee_Name, Monthly_salary, Delivery_date, Price, Shipping_address, Customer_Name, Order_status, Complaint_status, Type, Comment, No_of_Stars, Quantity, Stock_Price, Selling_price)

2) **Since FD 2 is a violation in BCNF:**

Closure of LHS of Publication_ID, Issue_Number → Magazine_Title:
{Publication_ID, Issue_Number}+ = {Publication_ID, Issue_Number, Magazine_Title}

R3(Publication_ID, Issue_Number, Magazine_Title) - in BCNF

Publication_ID	Issue_Number	Magazine_title

R4(Publication_ID, Issue_Number, Employee_ID, Order_ID, Customer_ID, Rating_ID, Stock_ID, Employee_Name, Monthly_salary, Delivery_date, Price, Shipping_address, Customer_Name, Complaint_status, Type, Comment, No_of_Stars, Quantity, Stock_Price, Selling_price)

3) **Since FD 3 is a violation in BCNF:**

Closure of LHS of Employee_ID → Employee_Name, Monthly_salary:
{Employee_ID}+ = {Employee_ID, Employee_Name, Monthly_salary}

R5(Employee_ID, Employee_Name, Monthly_salary) - in BCNF

Employee_ID	Employee_Name	Monthly_salary

R6(Publication_ID, Issue_Number, Employee_ID, Order_ID, Customer_ID, Rating_ID, Stock_ID, Delivery_date, Price, Shipping_address, Customer_Name, Order_status, Complaint_status, Type, Comment, No_of_Stars, Quantity, Stock_Price, Selling_price)

4) **Since FD 4 is a violation in BCNF:**

Closure of LHS of Order_ID → Delivery_date, Price, Quantity, Shipping_address, Order_status:
{Order_ID}+ = {Order_ID, Delivery_date, Price, Quantity, Shipping_address, Order_status}

R7(Order_ID, Delivery_date, Price, Quantity, Shipping_address, Order_status) - in BCNF

Order_ID	Delivery_date	Price	Quantity	Shipping_address	Order_status

R8(Publication_ID, Issue_Number, Employee_ID, Order_ID, Customer_ID, Rating_ID, Stock_ID, Customer_Name, Type, Comment, No_of_Stars, Stock_Price, Complaint_status, Selling_price)

5) **Since FD 5 is a violation in BCNF:**

Closure of LHS of Customer_ID → Customer_Name:
{Customer_ID}+ = {Customer_ID, Customer_Name}

R9(Customer_ID,Customer_Name) - in BCNF

Customer_ID	Customer_Name

R10(Publication_ID, Issue_Number, Employee_ID, Order_ID, Customer_ID, Rating_ID, Stock_ID, Type, Comment, Complaint_status, No_of_Stars, Stock_Price, Selling_price)

6) **Since FD 6 is a violation in BCNF:**

Closure of LHS of Complaint_ID → Complaint_status, Type:
{Complaint_ID}+= {Complaint_ID, Complaint_status, Type}

R11(Complaint_ID, Complaint_status, Type) - in BCNF

Complaint_ID	Complaint_status	Type

R12(Complaint_ID, Publication_ID, Issue_Number, Employee_ID, Order_ID, Customer_ID, Rating_ID, Stock_ID, Comment, No_of_Stars, Stock_Price, Selling_price)

7) **Since FD 7 is a violation in BCNF**

Closure of LHS of Rating_ID → Comment, No_of_Stars:
{Rating_ID}+ = {Rating_ID, Comment, No_of_Stars}

R13(Rating_ID, Comment, No_of_Stars) - in BCNF

Rating_ID	Comment	No_of_Stars

R14(Complaint_ID, Publication_ID, Issue_Number, Employee_ID, Order_ID, Customer_ID, Rating_ID, Stock_ID, Stock_Price, Selling_price)

8) **Since FD 8 is a violation in BCNF**

Closure of LHS of Publication_ID, Stock_ID → Quantity, Stock_Price
{Publication_ID, Stock_ID}+ = {Quantity, Stock_Price}

R15(Publication_ID, Stock_ID, Quantity, Stock_Price) - in BCNF

Publication_ID	Stock ID	Stock Price	Quantity

R16(Complaint_ID, Publication_ID, Issue_Number, Employee_ID, Order_ID, Customer_ID, Rating_ID, Stock_ID, Selling_price)

9) **Since FD 9 is a violation in BCNF**

Closure of LHS of Publication_ID, Stock_ID, Start_Date, End_Date → Selling_price
{Publication_ID, Stock_ID, Start_Date, End_Date}+ = {Publication_ID, Stock_ID, Start_Date, End_Date, Selling_price}

R17(Publication_ID, Stock_ID, Start_Date, End_Date, Selling_price)

Publication_ID	Stock ID	Start Date	End Date	Selling Price

R18(Complaint_ID, Publication_ID, Issue_Number, Employee_ID, Order_ID, Customer_ID, Rating_ID, Stock_ID) - All attributes are keys, therefore this relation is in BCNF.

Complaint_ID	Publication_ID	Issue_Number	Employee_ID	Order_ID	Customer_ID	Rating_ID	Stock_ID

- Every Non-Trivial FD is preserved, hence the decomposition to Boyce Codd Normal Form is complete. The resulting relations are as follows:

R1(Publication_ID, Avg_rating, Publisher, Year _of_publication)

R3(Publication_ID, Issue_Number, Magazine_Title)

R5(Employee_ID, Employee_Name, Monthly_salary)

R7(Order_ID, Delivery_date, Price, Quantity, Shipping_address, Order_status)

R9(Customer_ID,Customer_Name)

R11(Complaint_ID, Complaint_status, Type)

R13(Rating_ID, Comment, No_of_Stars)

R15(Publication_ID, Stock_ID, Quantity, Stock_Price)

R17(Publication_ID, Stock_ID, Start_Date, End_Date, Selling_price)

R18(Complaint_ID, Publication_ID, Issue_Number, Employee_ID, Order_ID, Customer_ID, Rating_ID, Stock_ID)