Ethan Coyle and Paxton Proctor
Assignment 3 CMPS 4132
Normalization
10/22/2022

1.

Shipment	Origin	Destination	Ship_Number	Item_Number	Type	Description	Weight	Quantity	Total_weight	Shipment_Expected_arrival		Captain_ID	Captain_Name	Shipment_Total
00-001	Boston	Brazil	39	3223	BM	Concrete Form	500	100	50000.00	1/10/2021	1/14/2021	002-15	Henry Moor	224,000
00-001	Boston	Brazil	39	3297	BM	Steel Beam	87	2,000	174000.00	1/10/2021	1/14/2021	002-15	Henry Moor	224,000

2. To get this to a relation, the multivalued attributes need to be replaced and put inside of another table. A relation does not have a multivalued attribute so these need to be changed such as the captain and the shipping date. There are also partial dependencies inside of this that need to be removed to make this a relation. The primary keys are Shipment_ID and Item_Number.

3. This first one is not in 1NF since there are non-atomic values in the relation so this needs to convert the composite keys Shipment_ID and Item_Number to be selected as the primary keys and then after removing partial dependencies, question 5 depicts this table in 2NF.

4. The functional dependencies inside of the manifest include:

<u>From the first table :</u>

Shipment ID -> Origin

Shipment ID -> Shipment Date

Shipment ID -> Destination

Shipment ID -> Ship Number

Shipment ID -> Expected Arrival

Shipment ID -> Captain

{Ship Number, Shipment Date} -> Captain

<u>From the second table:</u>

Item Number -> Type

Item Number -> Description

Item Number -> Weight

Item Number -> Quantity

Item Number -> TOTALWEIGHT

Looking at the above tables, we can see that the primary key for the first table is Shipment_ID with all the other attributes following. And in the second table Item_Number is the primary key for this table.

5.

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Shipment_ID -> Shipment_Date, Expected_Arrival, Origin_Destination, Ship_Number, CaptainID, CaptainName

Item_Number -> Type, Description, Weight

Shipment_ID, Item_Number-> Quantity , Total_Weight

This is now in 2NF after removing the partial dependencies inside of the tables showing the relations and their keys inside of the table.

6.

SHIPMENT

Shipment_ID-> Shipment_Date, Expected_Arrival, Origin_Destination, Ship_Number

Primary Key: Shipment_ID

Foreign Key: Captain ID referencing relation CAPTAIN

CAPTAIN

CaptainID-> CaptainName

Primary Key: Captain_ID

SHIP

Ship_Number-> CaptainID

ITEM

Item_Number ->Type, Description, Weight

Primary Key: Item_Number

SHIPMENT_ITEM

Shipment_ID-> Item_Number, Quantity, Total_Weight

Primary Key: Shipment_ID, Item_Number

Foreign Key: Shipment Id references to the relation from the SHIPMENT

Foreign Key: Item_Number references to the relation from the ITEM

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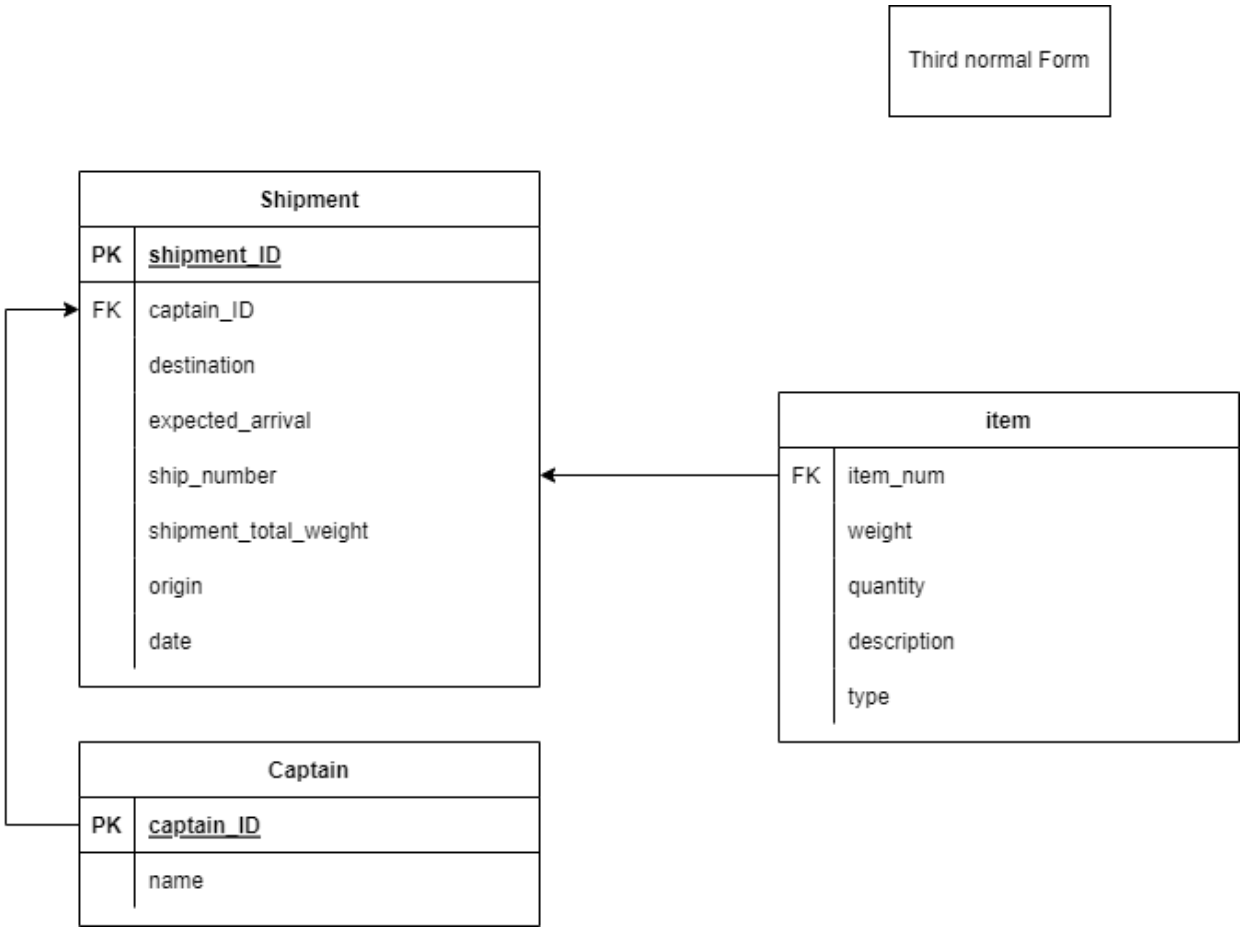
7.



8.