Lab-6

1. Convert the logical model below into a physical model. Select the appropriate data types and specify any fields that should not allow NULLs.

PUBLISHER (Publisher_Name, City, Country, Main_Phone, Fax, Year_Founded)
BOOK (Book_Number, Name, Publication_Year, Pages, Publisher_Name)
BOOK_AUTHOR (Book_Number, Author_Number)
AUTHOR (Author_Number, Name, Year_Born, Year_Died)
BOOK_CUSTOMER (Book_Number, Customer_Number, Date, Price, Quantity)
CUSTOMER (Customer_Number, Name, Street, City, State, Country)

PUBLISHER(

Publisher_Name	VARCHAR2(25)	Unique NOT NULL,
City	VARCHAR2(25)	NOT NULL,
Country	VARCHAR2(3)	NOT NULL,
Main_Phone	NUMBER(10,0)	NOT NULL,
Fax	NUMBER(10,0),	
Year_Founded	NUMBER(4,0)	NOT NULL,

)

BOOK(

Book_Number	VARCHAR2(25)	Unique NOT NULL,
Name	VARCHAR2(25)	NOT NULL,
Publication_Year	NUMBER(4,0)	NOT NULL,
Pages	NUMBER(4,0)	Check(0-9999),
Publisher_Name	VARCHAR2(25)	NOT NULL,

)

BOOK_AUTHOR(

Book_Number	VARCHAR2(25)	Unique NOT NULL,
Author_Number	NUMBER(10,0)	Unique Check(0-9999999999) NOT NULL,

)

AUTHOR(

Author_Number	NUMBER(10,0)	Unique Check(0-9999999999) NOT NULL,
Name	VARCHAR2(30,0)	Unique NOT NULL,
Year_Born	NUMBER(4,0)	NOT NULL,

Year_Died	NUMBER(4,0)	NOT NULL,

)

BOOK_CUSTOMER(

Book_Number	VARCHAR2(25)	Unique NOT NULL,
Customer_Number	NUMBER(10,0)	Unique Check(0-9999999999) NOT NULL ,
Date	NUMBER(10,0)	NOT NULL
Price	NUMBER(8,2)	NOT NULL
Quantity	NUMBER(3,0)	NOT NULL

)

CUSTOMER(

Customer_Number	NUMBER(10,0)	Unique Check(0-9999999999) NOT NULL ,
Name	VARCHAR2(20)	Unique NOT NULL,
Street	VARCHAR2(10)	NOT NULL,
City	VARCHAR2(10)	NOT NULL,
State	CHAR(2)	NOT NULL,
Country	CHAR(3)	NOT NULL,

)

2. Convert the logical model below into a physical model. Select the appropriate data types and specify any fields that should not allow NULLs.

MANUFACTURER (Manufacturer_Name, Country, Sales_Rep_Name, Sales_Rep_Main_Phone, Sales_Rep_Cell_Phone)
CAR (Car_Serial_Number, Model, Year, Class, Manufacturer_Name)
MAINTENANCE_EVENT (Repair_Number, Date, Procedure, Mileage, Repair_Time, Car_Serial_Number)
CAR_RENTED (Rental_Agreement_Number, Car_Serial_Number, Customer_Number, Rental_Date, Return_Date, Total_Cost)
CUSTOMER (Number, Name, Address1, Address2, City, State, Zip, Telephone)

Assumptions: *Manufacturer is default constraint because the a manufacturer won't make a car under a different name.

MANUFACTURER(

Manufacturer_Name	VARCHAR2(15)	Unique Default,
Country	CHAR(3)	NOT NULL,
Sales_Rep_Name	VARCHAR2(20)	NOT NULL,
Sales_Rep_Main_Phone	NUMBER(10,0)	NOT NULL,
Sales_Rep_Cell_Phone	NUMBER(10,0)	NOT NULL,

)

CAR(

Car_Serial_Number	VARCHAR2(15)	Unique NOT NULL,
Model	VARCHAR(12)	NOT NULL,
Year	NUMBER(4,0)	NOT NULL,
Class	CHAR(1)	NOT NULL,
Manufacturer_Name	VARCHAR2(15)	Unique Default,

)

MAINTENANCE_EVENT(

Repair_Number	NUMBER(7,0)	Unique NOT NULL,
Date	NUMBER(4,0)	NOT NULL,
Procedure	VARCHAR2(15)	NOT NULL,
Mileage	NUMBER(6,0)	Check(0-999999),
Repair_Time	NUMBER(2,0)	NOT NULL,

Car_Serial_Number	VARCHAR2(15)	Unique NOT NULL,
)		

CAR_RENTED(

Rental_Agreement_Number	NUMBER(10,0)	Unique NOT NULL,
Car_Serial_Number	VARCHAR2(15)	Unique NOT NULL,
Customer_Number	VARCHAR2(10)	Unique NOT NULL,
Rental_Date	VARCHAR2(10)	NOT NULL,
Return_Date	VARCHAR2(10)	NOT NULL,
Total_Cost	NUMBER(4,0)	NOT NULL Check(0-9999),
)		

CUSTOMER(

Customer_Number	VARCHAR2(10)	Unique NOT NULL,
Name	VARCHAR2(20)	Unique NOT NULL,
Address_1	VARCHAR2(15)	NOT NULL,
Address_2	VARCHAR2(15),	
City	VARCHAR2(10)	NOT NULL,
State	CHAR(2)	NOT NULL,
Zip	NUMBER(9,0)	NOT NULL,
Telephone	NUMBER(10,0)	NOT NULL,
)		

3. For each of the physical models above, specify the indices you think need to be created and give a justification for each one.

For the first problem you would need indices for the Publisher_Name, Book_Number, Author_Number and Customer_Number because they are called in multiple tables.

As for the second problem the indices would be for Manufacturer_Name, Car_Serial_Number, Rental_Agreement, Repair_Number and Customer_Number because they are also referenced in multiple tables.