

Database Management System I

CPS 542 – Fall 2022

Date: 11/3/2022

To: 11/30/2022

From: Group #2

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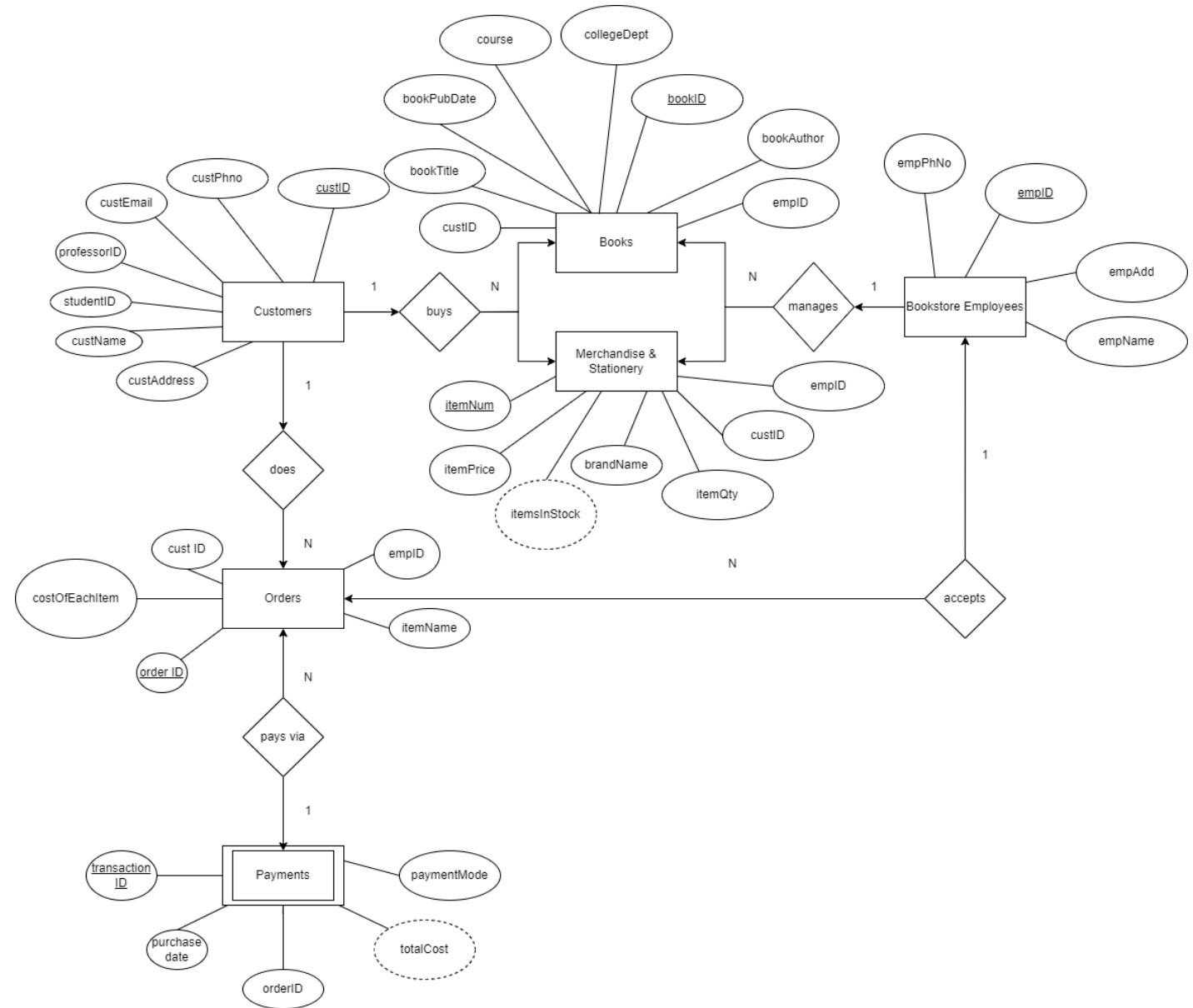
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Application Description:

For our group project, we decided to create a university bookstore. Within our university bookstore database, we decided to focus on the interaction of a customer ordering a book/merchandise from this university bookstore. Due to this interaction, we derived six entities that would encapsulate the interaction related to the university bookstore. Our six entities contain customers, books, merchandise/stationary, bookstore employees, orders, and payments (our weak entity). In our application, we hope to show simplified and clear instructions about our data allocation. Also, we want to encapsulate a sensible interaction/transaction of a university bookstore and apply it to the primary structure of our database. Altogether, our goal for our database is to deliver a straightforward design that covers/follows the central interaction recreated inside a university bookstore.

Conceptual Model (ER diagram):

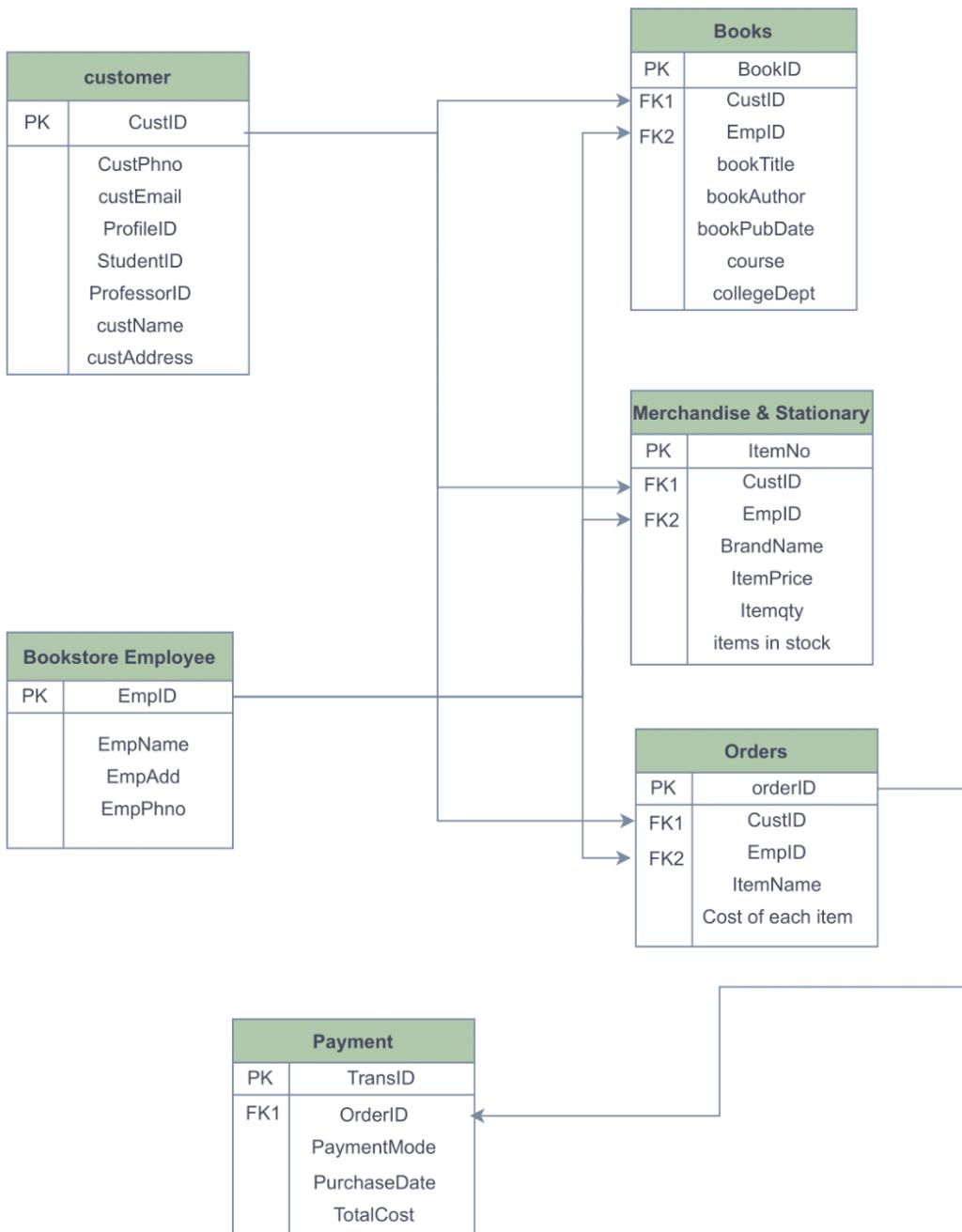


Special consideration and assumptions:

Entity	Keys	Attributes	Relation
Customers (Strong Entity)	Primary key: Customer ID(custID)	<ul style="list-style-type: none"> - Customer ID(custID) - Student ID - Professor ID - Customer name(custName) - Customer email(custEmail) - Customer phone number(custPhno) - Customer address(custAddress) 	<p>1 to N: One Customer can buy many products.</p> <p>1 to N: One customer can do many orders.</p>
Books (Strong Entity)	Primary key: BookID Foreign key: Customer ID(custID) Employee ID(EmpID)	<ul style="list-style-type: none"> - BookID - BookTitle - Book Publish Date(bookPubDate) - Course - College - Department(collegeDept) - BookAuthor 	<p>N to 1: Many Books can be bought by one Customer.</p> <p>N to 1: Many Books can be managed by One Customer.</p>
Merchandise & Stationery	Primary key: ItemNo Foreign key: Customer ID(custID) Employee ID(EmpID)	<ul style="list-style-type: none"> - Item Number(ItemNo) - Item Price(ItemPrice) - Brand Name(BrandName) - Item Quantity(Itemqty) - Items in stock 	<p>N to 1: Many Merchandise & Stationery can be bought by one Customer.</p> <p>N to 1: Many Merchandise & Stationery can be managed by One Customer.</p>
Bookstore Employees (Strong Entity)	Primary key: Employee ID(EmpID)	<ul style="list-style-type: none"> - Employee ID(EmpID) - Employee phone number(EmpPhno) - Employee address(EmpAdd) - Employee Name(EmpName) 	<p>1 to N: One Employee manages Books, Merchandise & Stationery.</p> <p>1 to N: One Employee accepts many orders &</p>

			Payments from customers.
Orders (Strong Entity)	Primary key: Order ID(orderID) Foreign key: Customer ID(custID) Employee ID(EmpID)	- Order ID(orderID) - Customer ID(custID) - EmpID - Cost of each item(Derived Attribute) - ItemName	N to 1: Many Orders can be made by One Customer. N to 1: Many orders can be paid through one payment.
Payments (Weak Entity)	Primary key: Transaction ID(TransID) Foreign key: Order ID	- TransactionID(TransID) - Purchase date(PurchaseDate) - OrderID - Total Cost(Derived Attribute) - Payment mode(PaymentMode)	1 to N: One payment can be done for many Orders

Initial Database Schema:



Final Database Schema:

Customer(custID, StudentID, ProfessorID,)

Student(StudentID, Custphn, CustEmail, custName, custAddress)

Professor(ProfessorID, Custphn, CustEmail, custName, custAddress)

Books(BookID, custID, empID, bookTitle, bookAuthor, BookPubDate, course, bookprice)

Course(course, collegeDept)

M & S(itemNo, custID, EmpID, brandName, itemname, itemprice)

Item Quantity(itemname, total, items sold, items in stock)

Orders(orderID, custID, empID, itemName, costof eachitem, itemsold, TotalCostofthatitem)

Trans(TransID, OrderID, PaymentMode, PurchaseDate, Totalcost)

Bookstore employee(empID, empName, empAdd, empPhno)

Discuss how all 4 properties of good database design holds:

Once we had our initial database schema developed, we further analyzed our database schema by running it through the normalization tests. We first started with 1NF, where we looked for if all the key attributes are defined, there are no repeating groups in the table, and if all remaining attributes depend on the primary key. Relating the 1NF test to our initial database schema, we passed in defining our primary attributes, containing no repeating groups, and that all attributes depend on a primary key. After passing 1NF, our group transitioned our database schema to 2NF. When in 2NF, we check if we are in 1NF and if our database schema includes no partial dependencies. From our 2NF test, we did not have any partial dependencies and continued throughout the normalization system to 3NF. Before we tested 3NF, we listed all non-trivial dependencies. Listed below are all of our non-trivial dependencies:

Non Trivial Dependencies:

{cust ID} → all attributes

{student ID} → custName, Custphn, cust Email, cust Address

{professor ID} → custName, Custphn, custEmail, custAddress

{Book ID} → book title, book author, bookPubDate, course

{course} → collegedept

{itemNo} → All attributes,

{itemqty} → item in stock,

$\{orderID\} \rightarrow$ All attributes,

$\{empID\} \rightarrow$ all attributes

$\{TransID\} \rightarrow$ all attributes

$\{orderID\} \rightarrow$ TotalCost

$\{custID, empID\} \rightarrow$ all attributes

SuperKey: $\{custID, empID\}$

Candidate Keys: $\{custID\}, \{empID\}, \{custID, StudentID\}, \{custID, ProfessorID\}, \{custID, empID\}$

From these non-trivial dependencies, we found relations where we can take them out to either a new primary key or apply it as a candidate key. By finding our non-trivial dependencies, we can group out attributes and put them clearly and concisely instead of clumping all the attributes together. Those grouped-out attributes each contain their primary key; therefore, passing 3NF where there are no transitive dependencies. In the last step, we go through the BCNF form to test if there are no non-trivial functional dependencies. When applying the test to our newly formed schema, we pass BCNF by containing no non-trivial functional dependencies. Overall, this normalization process allows us to find the design of our database schema that contains concise and clear relationships and constraints.

Database Instance: a listing of the data contained in your database.

1.CUSTOMER

SELECT * FROM CUSTOMER		
Results Explain Describe Saved SQL History		
CUSTID	STUDENTID	PROFESSORID
1001	1000000001	-
1002	1000000003	-
1003	1000000001	-
1004	1000000007	-
1005	1000000009	-
1006	1000000007	-
1007	1000000019	-
1008	1000000018	-
1009	1000000015	-
1010	1000000020	-
1011	-	9000001004
1012	-	9000001007
1013	-	9000001009
1014	-	9000001011
1015	-	9000001009
1016	-	9000001019
1017	-	9000001007
1018	-	9000001018
1019	-	9000001005
1020	-	9000001003

20 rows returned in 0.00 seconds [Download](#)

2.STUDENT

SELECT * FROM STUDENT				
Results Explain Describe Saved SQL History				
STUDENTID	CUSTPHN	CUSTEMAIL	CUSTNAME	CUSTADDRESS
1000000001	9375207393	bhoomika12@udayton.edu	BHOOMIKA PUTTARAJU	937 DAYTON OHIO
1000000002	9375207356	tejaswi45@udayton.edu	TEJASWI MOHAN	938,AptA,DAYTON,OHIO
1000000003	9375207432	yamini23@udayton.edu	YAMINI CHANDRASHEKAR	945,IRVING AVENUE,APT5,DAYTON,OHIO
1000000004	9375207456	rajesh43@udayton.edu	RAJESH PASUPALITI	938,DAYTON TOWERS,4D,DAYTON,OHIO
1000000005	9375207765	sanjana56@udayton.edu	SANJANA RAJESH	938,AptB,DAYTON,OHIO
1000000006	9375207432	julia89@udayton.edu	JULIA BAYES	956,AptC,DAYTON,OHIO
1000000007	9375207547	ranjitha90@udayton.edu	RANJITHA PALLERLA	938,DAYTON TOWERS,2L,DAYTON,OHIO
1000000008	9375207876	mythili87@udayton.edu	MYTHILI SHANKAR	938,DAYTON TOWERS,12L,DAYTON,OHIO
1000000009	9375204356	pratyusha77@udayton.edu	PRATYUSHA BATTULA	938,DAYTON TOWERS,12L,DAYTON,OHIO
1000000010	9375204568	sathvika55@udayton.edu	SATHVIKA KOLISETTY	938,DAYTON TOWERS,4D,DAYTON,OHIO
1000000011	9375204765	shailaja34@udayton.edu	SHAILAJA GARNEKAR	938,IRVING AVENUE,APT5,DAYTON,OHIO
1000000012	9375204876	chandana23@udayton.edu	CHANDANA THANDELPATTY	938,SOUTHQUAD,APT1,DAYTON,OHIO
1000000013	9375204321	preetham55@udayton.edu	PREETAM MANI	938,DAYTON TOWERS,4D,DAYTON,OHIO
1000000014	9375204567	ifteqar98@udayton.edu	IFTEQAR BRO	938,DAYTON TOWERS,4D,DAYTON,OHIO
1000000015	9375204987	saleem43@udayton.edu	SALEEM THONDURU	938,DAYTON TOWERS,8Q,DAYTON,OHIO
1000000016	9375254321	karthik89@udayton.edu	KARTHIK REDDY	938,DAYTON TOWERS,8Q,DAYTON,OHIO
1000000017	9375256789	vyshnavi91@udayton.edu	VYSHNAVI MOHALA	938,DAYTON TOWERS,8Q,DAYTON,OHIO
1000000018	9375254675	shikara11@udayton.edu	SHIKARA YADAV	938,DAYTON TOWERS,8Q,DAYTON,OHIO
1000000019	9375266754	anusha78@udayton.edu	ANUSHA REPALA	938,DAYTON TOWERS,12L,DAYTON,OHIO
1000000020	9375256785	Nishanth13@udayton.edu	NISHANTH NIRANJAN	938,IRVING AVENUE,APT49,DAYTON,OHIO

3.PROFESSOR

SELECT * FROM PROFESSOR				
PROFESSORID	CUSTPHN	CUSTEMAIL	CUSTNAME	CUSTADDRESS
9000001001	9375205643	wyong@udayton.edu	WYONG CHU	912,DAYTON AVENUE,APT5,DAYTON,OHIO
9000001002	9375207865	eman@udayton.edu	EMAN ELRIFAEI	913,DAYTON AVENUE,APT5,DAYTON,OHIO
9000001003	9375209876	arjun@udayton.edu	ARJUN PALEKAR	911,DAYTON AVENUE,APT5,DAYTON,OHIO
9000001004	9375209654	aaryan@udayton.edu	AARYAN VIRGINIA	938,SALEM AVENUE,4D,DAYTON,OHIO
9000001005	9375209654	arun@udayton.edu	ARUN BATTAIL	938,Ap1B, VIRGINIA AVE, DAYTON, OHIO
9000001006	9375209087	ananya@udayton.edu	ANANYA PANDEY	956,Ap1C,WAYNE AVE,DAYTON,OHIO
9000001007	9375209993	sita@udayton.edu	SITA RAMAM	938,KETTERING,2L,DAYTON,OHIO
9000001008	9375209998	peter@udayton.edu	PETER PATER	938,VAN BUREN,12L,DAYTON,OHIO
9000001009	9375209997	tom@udayton.edu	TOM NGUYEN	938,KETTERING,12L,DAYTON,OHIO
9000001010	9375209996	gary@udayton.edu	GARY MODLER	938,MIAMISBURG,4D,DAYTON,OHIO
9000001012	9375209865	joe@udayton.edu	JOE TRIBIYANI	938,PATTERSON,APT1,DAYTON,OHIO
9000001011	9375209993	chandler@udayton.edu	CHANDLER BING	938,WILMINGTON,APT5,DAYTON,OHIO
9000001013	9375209987	monica@udayton.edu	MONICA GELLAR	WILMINGTON,4D,DAYTON,OHIO
9000001014	9375209986	rachael@udayton.edu	RACHAEL GREEN	PATTERSON,4D, DAYTON, OHIO
9000001015	9375209984	phoebe@udayton.edu	PHOEBE BUFFAY	WAYNE AVE,8Q,DAYTON,OHIO
9000001016	9375259983	ross@udayton.edu	ROSS GELLAR	SALEM AVENUE,8Q,DAYTON,OHIO
9000001017	9375259982	gunther@udayton.edu	GUNTHER GUNTHE	WILMINGTON,8Q,DAYTON,OHIO
9000001018	9375259981	mike@udayton.edu	MIKE STUFFAY	PATTERSON,8Q,DAYTON,OHIO
9000001020	9375259978	gellar@udayton.edu	GELLAR CHOE	938,CENTRAL PERK,,APT49,DAYTON,OHIO
9000001019	9375269980	sheldon@udayton.edu	SHELDON COOPER	MIAMISBURG,12L,DAYTON,OHIO

4.BOOKS

SELECT * FROM BOOKS							
BOOKID	CUSTID	EMPID	BOOKTITLE	BOOKAUTHOR	BOOKPUBDATE	COURSE	BOOKPRICE
2345601	1001	30105012	ALGORITHMS TO LIVE BY:THE COMPUTER SCIENCE OF HUMAN DECISIONS	BRIAN CHRISTIAN	10/11/1987	COMPUTER SCIENCE	24
2345602	1003	30105009	ARTIFICIAL INTELLIGENCE:A MODERN APPROACH	PETER NORVIG	11/10/1994	COMPUTER SCIENCE	35
2345603	1002	30105011	A PRACTICAL HANDBOOK OF SOFTWARE CONSTRUCTON	STEVE MCCONNELL	09/10/1995	COMPUTER SCIENCE	18
2345604	1004	30105009	THE HIDDEN LANGUAGE OF COMPUTER HARDWARE AND SOFTWARE	CHARLES PETZOLD	05/09/1956	COMPUTER SCIENCE	23
2345605	1002	30105009	COMPUTER NETWORKING:A TOP-DOWN APPROACH	JAMES KUROSE	05/10/1978	COMPUTER SCIENCE	23
2345609	1015	30105014	THE VLSI HANDBOOK	WAI-KAI CHEN	12/14/2007	ELECTRICAL AND COMPUTER ENGINEERING	43
2345610	1011	30105008	WIRELESS TECHNOLOGY	.D. YACOUB	12/03/2007	ELECTRICAL AND COMPUTER ENGINEERING	52
2345611	1017	30105011	ORBITAL MECHANICS	HOWARD D CURTIS	10/26/1998	AEROSPACE ENGINEERING	34
2345612	1006	30105013	ROCKET PROPULSION ELEMENTS	GEORGE P SUTTON	09/12/1997	AEROSPACE ENGINEERING	22
2345613	1013	30105015	AIRCRAFT CONTROL AND SIMULATION	BRIAN L STEVENS	06/24/1999	AEROSPACE ENGINEERING	18
2345614	1008	30105017	AIRCRAFT STRUCTURES	DAVID J PEERY	07/15/2001	AEROSPACE ENGINEERING	13
2345615	1011	30105019	MISSILE DESIGN AND SYSTEM ENGINEERING	EUGENE L FLEEMAN	11/23/1998	AEROSPACE ENGINEERING	19
2345616	1015	30105008	CHEMICAL ENGINEERS HANDBOOK	PERRY	01/17/1978	CHEMICAL ENGINEERING	-
2345617	1009	30105006	DISTILLATION DESIGN	HENRY KISTER	03/03/2003	CHEMICAL ENGINEERING	23
2345618	1006	30105012	TRANSPORT PHENOMENA	BYRON BIRD	10/10/2010	CHEMICAL ENGINEERING	14
2345619	1014	30105012	CHEMICAL REACTION ENGINEERING	OCTAVE LEVENSPIEL	10/05/1997	CHEMICAL ENGINEERING	12
2345620	1018	30105018	RULES OF THUMB FOR CHEMICAL ENGINEERS	CRAL BRANAN	10/09/2001	CHEMICAL ENGINEERING	-
2345606	1006	30105012	THE COMMUNICATIONS HANDBOOK	J D GIBSON	05/10/2002	ELECTRICAL AND COMPUTER ENGINEERING	49
2345607	1009	30105019	ENCYCOPEDIA OF VIBRATIONS	S BARUIN	03/20/2001	ELECTRICAL AND COMPUTER	30

5. COURSE

SELECT * FROM COURSE	
Results Explain Describe Saved SQL History	
COURSE	COLLEGEDEPT
ARTIFICIAL INTELLIGENCE	COMPUTER SCIENCE
INTERACTIVE MEDIA	COMPUTER SCIENCE
SOFTWARE ENFINEERING	COMPUTER SCIENCE
DATABASE MANAGEMENT SYSTEM	COMPUTER SCIENCE
ANALYSIS AND DESIGN	COMPUTER SCIENCE
CIRCUIT ANALYSIS	ELECTRICAL AND COMPUTER ENGINEERING
ELECTRONIC DEVICES	ELECTRICAL AND COMPUTER ENGINEERING
DIGITAL SYSTEMS LABORATORY	ELECTRICAL AND COMPUTER ENGINEERING
SIGNALS AND SYSTEMS	ELECTRICAL AND COMPUTER ENGINEERING
ELECTROMAGNETICS	ELECTRICAL AND COMPUTER ENGINEERING
FLIGHT VEHICLE DYNAMICS	AEROSPACE ENGINEERING
FUNDAMENTAL AERODYNAMICS	AEROSPACE ENGINEERING
MECH SOFT MATERIALS	AEROSPACE ENGINEERING
STRUC DESIGN OPTIMZTN	AEROSPACE ENGINEERING
PROPELLION SYSTEMS	AEROSPACE ENGINEERING
FINITE ELEMENT ANALYSIS	AEROSPACE ENGINEERING
EXPERIMENTAL AERODYNAMICS	AEROSPACE ENGINEERING
MATERIAL AND ENERGY BALANCES	CHEMICAL ENGINEERING
CHEMICAL ENGINEERING COMPUTATION	CHEMICAL ENGINEERING
TRANSPORT PHENOMENA	CHEMICAL ENGINEERING
SEPERATION TECHNIQUES	CHEMICAL ENGINEERING
PROCESS CONTROL LABORATORY	CHEMICAL ENGINEERING

6.MERCHANDISE AND STATIONARY

SELECT * FROM COURSE	
Results Explain Describe Saved SQL History	
COURSE	COLLEGEDEPT
ARTIFICIAL INTELLIGENCE	COMPUTER SCIENCE
INTERACTIVE MEDIA	COMPUTER SCIENCE
SOFTWARE ENFINEERING	COMPUTER SCIENCE
DATABASE MANAGEMENT SYSTEM	COMPUTER SCIENCE
ANALYSIS AND DESIGN	COMPUTER SCIENCE
CIRCUIT ANALYSIS	ELECTRICAL AND COMPUTER ENGINEERING
ELECTRONIC DEVICES	ELECTRICAL AND COMPUTER ENGINEERING
DIGITAL SYSTEMS LABORATORY	ELECTRICAL AND COMPUTER ENGINEERING
SIGNALS AND SYSTEMS	ELECTRICAL AND COMPUTER ENGINEERING
ELECTROMAGNETICS	ELECTRICAL AND COMPUTER ENGINEERING
FLIGHT VEHICLE DYNAMICS	AEROSPACE ENGINEERING
FUNDAMENTAL AERODYNAMICS	AEROSPACE ENGINEERING
MECH SOFT MATERIALS	AEROSPACE ENGINEERING
STRUC DESIGN OPTIMZTN	AEROSPACE ENGINEERING
PROPELLION SYSTEMS	AEROSPACE ENGINEERING
FINITE ELEMENT ANALYSIS	AEROSPACE ENGINEERING
EXPERIMENTAL AERODYNAMICS	AEROSPACE ENGINEERING
MATERIAL AND ENERGY BALANCES	CHEMICAL ENGINEERING
CHEMICAL ENGINEERING COMPUTATION	CHEMICAL ENGINEERING
TRANSPORT PHENOMENA	CHEMICAL ENGINEERING
SEPERATION TECHNIQUES	CHEMICAL ENGINEERING
PROCESS CONTROL LABORATORY	CHEMICAL ENGINEERING

7.ITEM QUANTITY

Autocommit Rows 30 Save Run

```
SELECT * FROM ITEM_QUANTITY
```

Results Explain Describe Saved SQL History

TOTALQTY	ITEMS SOLD	ITEMNAME	ITEMSINSTOCK
30	0	FILES	30
30	0	SINGLE LINE BOOKS	30
30	0	T-SHIRT	30
30	0	CAPS	30
30	5	PENS	25
30	5	PENCILS	25
30	7	BELTS	23
10	1	UMBRELLA	9
10	2	CALENDAR	8
10	3	MARKER	7
13	1	HOODIES	12
15	1	TRACKPANT	14
15	2	WATCHES	13
15	2	COLORS	13
50	10	ERASER	40
30	7	SPIRAL BIND BOOK -200PAGES	23
30	2	BOXES-SMALL	28
30	3	BOXES-BIG	27
30	5	PAPERCLIPS	25

8.ORDERS

```
SELECT * FROM ORDERS
```

Results Explain Describe Saved SQL History

ORDERID	CUSTID	EMPID	ITEMNAME	COST_OF_EACHITEM	ITEMSOLD	TOTALCOST_OF_ITEM
101	1004	30105003	BELTS	45	2	90
102	1005	30105002	BELTS	45	1	45
103	1004	30105002	ERASER	1	3	3
102	1004	30105013	BOOKS	-	1	-
103	1005	30105012	CALENDAR	-	3	-
104	1007	30105011	HOODIES	43	4	172
105	1009	30105012	HOODIES	43	2	86
106	1008	30105011	HOODIES	43	3	129
107	1011	30105012	PENCILS	2	5	10
108	1012	30105013	PENCILS	2	1	2
109	1013	30105015	PENS	3	3	9
110	1017	30105019	PENS	3	2	6
111	1018	30105020	WATCHES	25	2	50
112	1020	30105020	WATCHES	25	3	75
113	1015	30105024	CAPS	-	1	-
114	1017	30105013	CAPS	-	4	-
115	1015	30105013	CAPS	-	2	-
116	1003	30105005	T-SHIRT	30	3	90
117	1004	30105007	T-SHIRT	30	2	60
118	1003	30105006	T-SHIRT	30	1	30
119	1002	30105006	T-SHIRT	30	3	90

9.BOOKSTORE EMPLOYEE

SELECT * FROM BOOKSTORE_EMPLOYEE				
Results Explain Describe Saved SQL History				
EMPID	EMPNAME	EMPPADD	EMPPHN	
30105001	BHUSHAN GOWDA	455 MAIN AVE, DAYTON, OHIO	8976545676	
30105002	KEVIN BHAM	457 MAIN AVE, DAYTON, OHIO	8976545676	
30105003	RICHARD BRIAN	459 MAIN AVE, DAYTON, OHIO	8976545676	
30105004	ALEX VERN	459 WAYNE AVE, DAYTON, OHIO	8976589075	
30105005	ZHU XIO VERN	487 WAYNE AVE, DAYTON, OHIO	8976589765	
30105006	VERNIN GOYRE	512 WAYNE AVE, DAYTON, OHIO	8976589345	
30105007	VICTORIA BELL	314 IRVING AVE, DAYTON, OHIO	8976548345	
30105008	SONIA VERNAN	564 IRVING AVE, DAYTON, OHIO	8976549321	
30105009	ELEVEN LEN	675 BLAKE AVE, DAYTON, OHIO	8976545443	
30105010	BOING TYU	543 BLAKE AVE, DAYTON, OHIO	8976545444	
30105011	HRITHIK ROSHAN	777 BLAKE AVE, DAYTON, OHIO	8976545477	
30105012	BLAKE MORE	965 KETTERING AVE, DAYTON, OHIO	8976544325	
30105013	SYSHANTH RAM	443 BAYSON AVE, DAYTON, OHIO	8976546565	
30105014	ZYAN MING	789 BAYSON AVE, DAYTON, OHIO	8976542323	
30105015	PHUNG MAI	567 BAYSON AVE, DAYTON, OHIO	8976543232	
30105016	THARUN KUMAR	555 BAYSON AVE, DAYTON, OHIO	8976565476	
30105017	BRIAN LIAM	565 BAYSON AVE, DAYTON, OHIO	8976567976	
30105018	VIAN BIN	560 BAYSON AVE, DAYTON, OHIO	8976565976	
30105019	SURESH LOKESH	580 VAN AVE, DAYTON, OHIO	8976563424	
30105020	SURYADU VARN	765 VAN AVE, DAYTON, OHIO	8976563423	

20 rows returned in 0.01 seconds [Download](#)

10.TRANSACTION

SELECT * FROM TRANSACTION				
Results Explain Describe Saved SQL History				
TRANSID	ORDERID	PAYMENETMODE	TOTALCOST	PURCHASEDATE
789272	101	CASH	90	11/10/1897
678902	117	CREDIT CARD	60	09/03/2022
389308	106	CREDIT CARD	129	10/26/2022
138138	102	CASH	45	03/02/2022
678234	103	CREDIT CARD	3	04/05/2022
342342	107	CASH	10	02/05/2022
234890	116	CASH	90	06/08/2022
389278	118	ONLINE PAYMENT	30	10/28/2022
890345	109	CASH	9	08/17/2022
190878	110	CASH	6	03/28/2022
389208	111	ONLINE PAYMENT	50	05/19/2022
289457	112	CASH	75	10/16/2022
673898	116	CREDIT CARD	90	03/20/2022
678937	120	CASH	90	05/28/2022

Data Manipulation: a listing of 10 example queries as well as the results (data retrieved).

```
SELECT EMPNAME from BOOKSTORE_EMPLOYEE
where EMPNAME LIKE 'A%'

Results Explain Describe Saved SQL History

EMPNAME
ALEX VERN

1 rows returned in 0.00 seconds Download
```

1.

```
Autocommit Rows 30 Save Run
SELECT DISTINCT CUSTID FROM BOOKS WHERE BOOKID>2345000

Results Explain Describe Saved SQL History

CUSTID
1003
1011
1013
1009
1017
1006
1001
1002
1004
1015
1008
1014
1018
1019

14 rows returned in 0.01 seconds Download
```

2.

```
SELECT CUSTOMER.STUDENTID, STUDENT.CUSTNAME, STUDENT.CUSTADDRESS FROM CUSTOMER INNER JOIN STUDENT ON CUSTOMER.STUDENTID=STUDENT.STUDENTID;
```

Results Explain Describe Saved SQL History

STUDENTID	CUSTNAME	CUSTADDRESS
1000000001	BHOOMIKA PUTTARAJU	937 DAYTON OHIO
1000000001	BHOOMIKA PUTTARAJU	937 DAYTON OHIO
1000000003	YAMINI CHANDRASHEKAR	945,IRVING AVENUE,APT5,DAYTON,OHIO
1000000007	RANJITHA PALLERLA	938,DAYTON TOWERS,2L,DAYTON,OHIO
1000000007	RANJITHA PALLERLA	938,DAYTON TOWERS,2L,DAYTON,OHIO
1000000009	PRATYUSHA BATTULA	938,DAYTON TOWERS,12L,DAYTON,OHIO
1000000015	SALEEM THONDURU	938,DAYTON TOWERS,8Q,DAYTON,OHIO
1000000018	SHIKARA YADAV	938,DAYTON TOWERS,8Q,DAYTON,OHIO
1000000019	ANUSHA REPALA	938,DAYTON TOWERS,12L,DAYTON,OHIO
1000000020	NISHANTH NIRANJAN	938,IRVING AVENUE,APT49,DAYTON,OHIO

10 rows returned in 0.01 seconds [Download](#)

3.

```
SELECT * from student UNION SELECT * FROM PROFESSOR;
```

Results Explain Describe Saved SQL History

STUDENTID	CUSTPHN	CUSTEMAIL	CUSTNAME	CUSTADDRESS
1000000001	9375207393	bhoomika12@udayton.edu	BHOOMIKA PUTTARAJU	937 DAYTON OHIO
1000000002	9375207356	tejaswi45@udayton.edu	TEJASWI MOHAN	938,Apt1A,DAYTON,OHIO
1000000003	9375207432	yamin23@udayton.edu	YAMINI CHANDRASHEKAR	945,IRVING AVENUE,APT5,DAYTON,OHIO
1000000004	9375207456	rajesh43@udayton.edu	RAJESH PASUPALITI	938,DAYTON TOWERS,4D,DAYTON,OHIO
1000000005	9375207765	sanjana56@udayton.edu	SANJANA RAJESH	938,AptB,DAYTON,OHIO
1000000006	9375207432	julia89@udayton.edu	JULIA BAYES	956,AptC,DAYTON,OHIO
1000000007	9375207547	ranjitha90@udayton.edu	RANJITHA PALLERLA	938,DAYTON TOWERS,2L,DAYTON,OHIO
1000000008	9375207876	mythili87@udayton.edu	MYTHILI SHANKAR	938,DAYTON TOWERS,12L,DAYTON,OHIO
1000000009	9375204356	pratyusha77@udayton.edu	PRATYUSHA BATTULA	938,DAYTON TOWERS,12L,DAYTON,OHIO
1000000010	9375204568	sathvik55@udayton.edu	SATHVIKA KOLISETTY	938,DAYTON TOWERS,4D,DAYTON,OHIO
1000000011	9375204765	shailaja34@udayton.edu	SHAILAJA GARNEKAR	938,IRVING AVENUE,APT5,DAYTON,OHIO
1000000012	9375204876	chandana23@udayton.edu	CHANDANA THANDELPATTY	938,SOUTHQUAD,APT1,DAYTON,OHIO
1000000013	9375204321	preetham55@udayton.edu	PREETAM MANI	938,DAYTON TOWERS,4D,DAYTON,OHIO
1000000014	9375204567	lfeqar98@udayton.edu	IFTEQAR BRO	938,DAYTON TOWERS,4D,DAYTON,OHIO
1000000015	9375204987	saleem43@udayton.edu	SALEEM THONDURU	938,DAYTON TOWERS,8Q,DAYTON,OHIO
1000000016	9375254321	karthik89@udayton.edu	KARTHIK REDDY	938,DAYTON TOWERS,8Q,DAYTON,OHIO
1000000017	9375256789	vyshnavi91@udayton.edu	VYSHNAVI MOHALA	938,DAYTON TOWERS,8Q,DAYTON,OHIO
1000000018	9375254675	shikara11@udayton.edu	SHIKARA YADAV	938,DAYTON TOWERS,8Q,DAYTON,OHIO
1000000019	9375266754	anusha78@udayton.edu	ANUSHA REPALA	938,DAYTON TOWERS,12L,DAYTON,OHIO
1000000020	9375256785	Nishanth13@udayton.edu	NISHANTH NIRANJAN	938,IRVING AVENUE,APT49,DAYTON,OHIO
9000001001	9375205643	wyong@udayton.edu	WYONG CHU	912,DAYTON AVENUE,APT5,DAYTON,OHIO
9000001002	9375207865	eman@udayton.edu	EMAN ELRIFAEI	913,DAYTON AVENUE,APT5,DAYTON,OHIO

4.

Autocommit Rows 30 Save Run

```
SELECT booktitle,bookauthor from books
where bookprice <25;
```

Results Explain Describe Saved SQL History

BOOKTITLE	BOOKAUTHOR
ALGORITHMS TO LIVE BY:THE COMPUTER SCIENCE OF HUMAN DECISIONS	BRIAN CHRISTIAN
A PRACTICAL HANDBOOK OF SOFTWARE CONSTRUCTION	STEVE MCCONNELL
THE HIDDEN LANGUAGE OF COMPUTER HARDWARE AND SOFTWARE	CHARLES PETZOLD
COMPUTER NETWORKING:A TOP-DOWN APPROACH	JAMES KROSE
ROCKET PROPULSION ELEMENTS	GEORGE P SUTTON
AIRCRAFT CONTROL AND SIMULATION	BRIAN L STEVENS
AIRCRAFT STRUCTURES	DAVID J PEERY
MISSILE DESIGN AND SYSTEM ENGINEERING	EUGENE L FLEEMAN
DISTILLATION DESIGN	HENRY KISTER
TRANSPORT PHENOMENA	BYRON BIRD
CHEMICAL REACTION ENGINEERING	OCTAWE LEVENSPIEL

11 rows returned in 0.00 seconds Download

5.

Application Express

Select itemname,itemsinstock from item quantity

```
SELECT itemname,itemsinstock from item quantity
where itemsinstock<10;
```

Results Explain Describe Saved SQL History

ITEMNAME	ITEMSINSTOCK
UMBERALLA	9
CALENDER	8
MARKER	7

3 rows returned in 0.00 seconds Download

6.

Select course, collegedept from course

```
Select course, collegedept from course
where collegedept = 'COMPUTER SCIENCE';
```

Results Explain Describe Saved SQL History

COURSE	COLLEGEDEPT
ARTIFICIAL INTELLIGENCE	COMPUTER SCIENCE
INTERACTIVE MEDIA	COMPUTER SCIENCE
SOFTWARE ENGINEERING	COMPUTER SCIENCE
DATABASE MANAGEMENT SYSTEM	COMPUTER SCIENCE
ANALYSIS AND DESIGN	COMPUTER SCIENCE

5 rows returned in 0.00 seconds Download

7.

Autocommit Rows 30 Save Run

```
SELECT CUSTID,ITEMNAME ,TOTALCOST_OF_ITEM
FROM ORDERS
WHERE TOTALCOST_OF_ITEM <30;
```

Results Explain Describe Saved SQL History

CUSTID	ITEMNAME	TOTALCOST_OF_ITEM
1004	ERASER	3
1011	PENCILS	10
1012	PENCILS	2
1013	PENS	9
1017	PENS	6

5 rows returned in 0.00 seconds Download

8.

Autocommit Rows 30 Save Run

```
SELECT SUM(TOTALCOST_OF_ITEM)
FROM ORDERS
```

Results Explain Describe Saved SQL History

SUM(TOTALCOST_OF_ITEM)
1037

1 rows returned in 0.00 seconds Download

9.

10.

```
SELECT TOTALQTY,ITEMS SOLD FROM ITEM_QUANTITY
WHERE ITEMNAME = 'ERASER'
```

Results Explain Describe Saved SQL History

TOTALQTY	ITEMS SOLD
50	10

1 rows returned in 0.01 seconds Download

Observations:

From our project, we had an incredible amount of progress. We began with an idea for creating a database centered around a university bookstore for our project. This idea led to finding 6 main entities and their following attributes. Already, our group has made significant progress from narrowing down a giant organization of a university bookstore to 6 entities. With these collected entities and their attributes, we found connections and implemented our findings into an entity-relational (E-R) diagram. Throughout the group, we thought it was great to start with a pictorial diagram version of our E-R model because it helped us visually see the connections and how the whole database will work out in the future. When we had the E-R diagram done, we continued basing the model on implementing it into our initial schema. Our initial schema aided in the starting process of normalization. This initial starting point helped us understand where to separate attributes and learn more about the connection of the attributes. After the normalization process, it gave us a final schema and a clear idea of how to approach coding the tables with MySQL in Oracle. When creating our tables, we had to go back to our normalization phase and change some attributes. By backtracking to our base, we learned more about the importance of normalization integrating into a physically coded database. Without the normalization, our coded database would not flow right and give us incorrect data. In the coding section, we had a great time inserting fake data into our coded database. Several of us got some of our friends and classmates to help provide names, book titles, and email addresses. Altogether, once we finished the project, we all truly enjoyed the process and learned a great deal about how a database works.

Seeing our progressions from such a simple idea of a database to coded tables is a very satisfying progression of proof of our newly gained skills. From the beginning to the end phase, we collected many skills that will aid in future work in all areas of companies to schools because they all use databases daily. In addition, our group thought it was fun to test our database by implementing various query commands to see our newly created data table. With these queries' implementation, we learned how to use unique MySQL commands to find interesting data.

With the chosen database we chose, during the initial phase, we were nervous about narrowing down all the entities to only 6. Though when we finally agreed on our 6 entities, the rest of the process worked out well. Throughout implementing our database, we did not have anything unexpected. The only thing that was kinda unexpected was revising our normalization outputs; however, we assumed it is normal to go back and fix the normalization output. The choice of the university bookstore helped in understanding what we are doing because we all went through buying books in our University of Dayton bookstore. Overall, we enjoyed learning about the database process and picking up the skills of implementing a fully functional database.