University Of Michigan Library Database
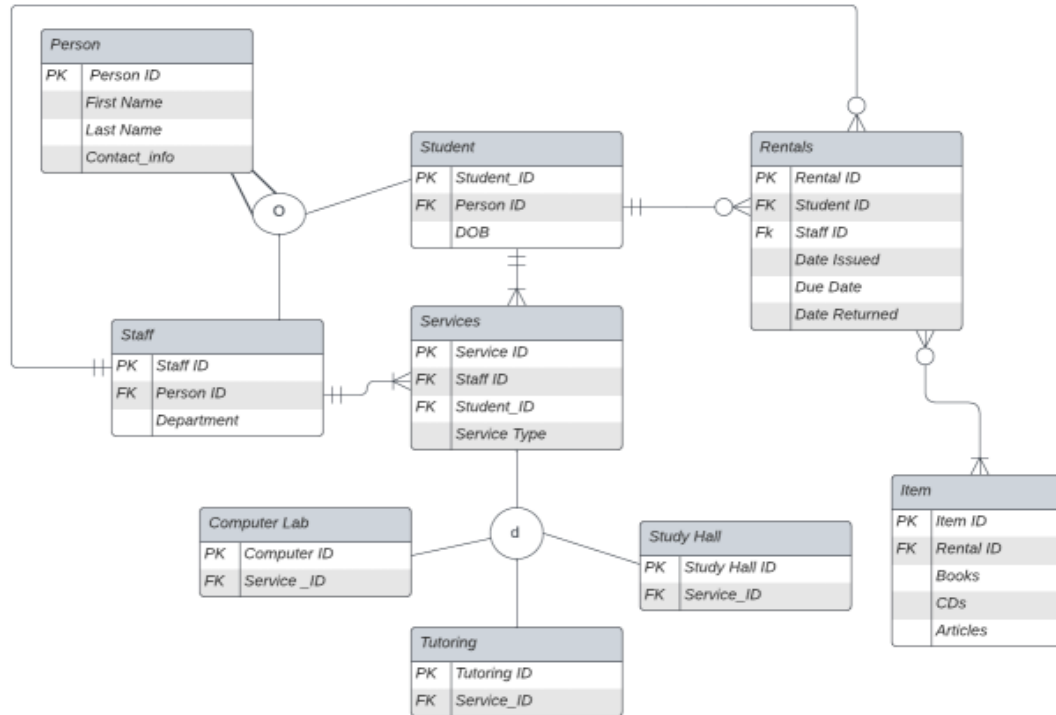
By: Hassan Faraj, Klevis Todi, Musa Zahoor

Some Background

- University of Michigan Library is a successful academic and research facility.
- Offers numerous resources for student learning, including study halls, online applications, and news articles.
- Offers research assistance, consultation, course instruction, and reference support.
- University of Michigan Hospitals are recognized for advanced research programs.
- Core principles include humanity, diversity, engagement, and excellence.
- Known for shaping the future and preparing students for success.
- Chosen for the project due to its reputation in supporting scholarly development and research.

Information Requirements

- University of Michigan Library offers diverse resources and services for research, study, and development.
- Database is a valuable asset, providing books, movies, online references, tutoring, computer lab use, and book clubs.
- Each service is associated with at least one staff member or student.
- Students can borrow zero to many books, with a minimum of one staff or student associated.
- A complete library catalog should include at least one book, one movie, and a single online reference.

The Conceptual Model

The Conceptual Model

- This model shows the structure of table as well as the relationships within the University of Michigan Library
- Person serves as the central entity, for everyone in the database
- Person table overlaps with the Staff and Students, because a person can be both a staff and student
- This framework keeps tracks of individuals, services as well as item transactions for this database
- Other tables included are Student, Staff, Services, Rentals, Computer Lab, Study Hall, Tutoring and Item
- Services table disjoints with Computer Lab, Tutoring and Study Hall tables because a student can only use one service at a time

The Logical Design

PK is **Bolded**

FK is *Italicized*

Person (**person_id**, first_name, last_name, Contact_info)

Student(**student_id**, *person_id*, DOB)

Staff(**staff_id**, *person_id*, Department)

Rentals(**rental_id**, *student_id*, *staff_id*, date_issued, due_date, date_returned)

Services(**service_id**, *staff_id*, *student_id*, service_type)

Computer Lab (**computer_id**, *service_id*)

Tutoring (**Tutoring_id**, *service_id*)

Study Hall (**study_hall_id**, *service_id*)

Item (**Item_id**, *Rental_id*, books, CDs, Articles)

Queries

1.
```sql
SELECT Name, Contact_Info
FROM Person
ORDER BY Name;
```

2.
```sql
SELECT
Date_Issued,
Due_Date,
Date_Returned,
CASE
WHEN Date_Returned IS NULL THEN 'Not Returned'
WHEN Date_Returned <= Due_Date THEN 'Returned Before Due Date'
ELSE 'Returned After Due Date'
END AS Return_Status
FROM Rentals;
```

3.
```sql
SELECT
    AVG(Due_Date - Date_Issued) AS Avg_Rental_Duration,
    MIN(Due_Date - Date_Issued) AS Min_Rental_Duration,
    MAX(Due_Date - Date_Issued) AS Max_Rental_Duration,
    COUNT(*) AS Total_Rentals
FROM Rentals;
```

4.
```sql
SELECT
    Staff.Staff_ID,
    Person.Name AS Staff_Name,
    Services.Service_ID,
    Services.Service_Type
FROM Staff
JOIN Services ON Staff.Staff_ID = Services.Staff_ID
JOIN Person ON Staff.Person_ID = Person.Person_ID;
```

5.
```sql
SELECT
Student.Student_ID,
Person.Name AS Student_Name,
Items.Item_ID,
Items.Books,
Items.CDs,
Items.Articles
FROM Student
JOIN Rentals ON Student.Student_ID = Rentals.Student_ID
JOIN Items ON Rentals.Rental_ID = Items.Rental_ID
JOIN Person ON Student.Person_ID = Person.Person_ID;
```

Query Results

1.

	NAME	CONTACT_INFO
1	Alice Johnson	alicejohnson@umich.edu
2	Bob Thompson	bobthompson@umich.edu
3	Christopher Perez	christopherperez@umich.edu
4	David Lopez	davidlopez@umich.edu
5	Emily Davis	emilydavis@umich.edu
6	James Garcia	jamesgarcia@umich.edu
7	Jane Smith	janesmith@umich.edu
8	John Doe	johndoe@umich.edu
9	Linda Hernandez	lindahernandez@umich.edu
10	Mary Turner	maryturner@umich.edu
11	Michael Brown	michaelbrown@umich.edu
12	Olivia Wilson	oliviawilson@umich.edu
13	Sarah Gonzalez	sarahgonzalez@umich.edu
14	Sophia Anderson	sophiaanderson@umich.edu
15	William Martinez	williammartinez@umich.edu

2.

	DATE_ISSUED	DUE_DATE	DATE_RETURNED	RETURN_STATUS
1	01-SEP-23	15-OCT-23	10-OCT-23	Returned Before Due Date
2	06-JUN-23	06-JUL-23	01-JUL-23	Returned Before Due Date
3	05-MAY-23	05-JUN-23	01-JUN-23	Returned Before Due Date
4	01-OCT-23	15-OCT-23	14-OCT-23	Returned Before Due Date
5	16-SEP-23	16-OCT-23	15-OCT-23	Returned Before Due Date
6	03-SEP-23	15-OCT-23	09-OCT-23	Returned Before Due Date
7	01-SEP-23	20-OCT-23	10-OCT-23	Returned Before Due Date
8	10-OCT-23	15-DEC-23	10-DEC-23	Returned Before Due Date
9	01-SEP-23	22-OCT-23	20-OCT-23	Returned Before Due Date
10	01-SEP-23	15-OCT-23	10-OCT-23	Returned Before Due Date

3.

	AVG_RENTAL_DURATION	MIN_RENTAL_DURATION	MAX_RENTAL_DURATION	TOTAL_RENTALS
1	40.1	14	66	10

Query Results Continued

4.

	STAFF_ID	STAFF_NAME	SERVICE_ID	SERVICE_TYPE
1	2000	Linda Hernandez	4000	Online Tutoring
2	2001	David Lopez	4001	In Person Tutoring
3	2002	Sarah Gonzalez	4002	Computer Lab
4	2003	Christopher Perez	4003	Study Hall

5.

	STUDENT_ID	STUDENT_NAME	ITEM_ID	BOOKS	CDS	ARTICLES
1	1111	John Doe	8000	The Maze Runner	(null)	(null)
2	2222	Jane Smith	8001	The Lord of the Rings	(null)	(null)
3	3333	Alice Johnson	8002	Harry Potter	(null)	(null)
4	4444	Bob Thompson	8003	The Hunger Games	(null)	(null)
5	5555	Emily Davis	8004	To Kill a Mockingbird	(null)	(null)
6	6666	Michael Brown	8008	(null)	(null)	Economics in the world today
7	7777	Olivia Wilson	8009	(null)	(null)	Samsung vs Apple

Thank You!