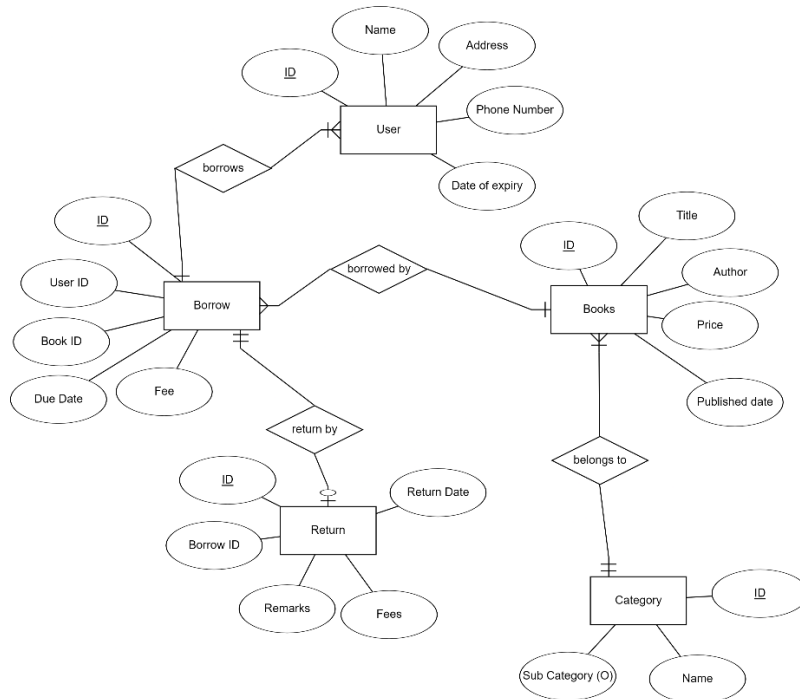
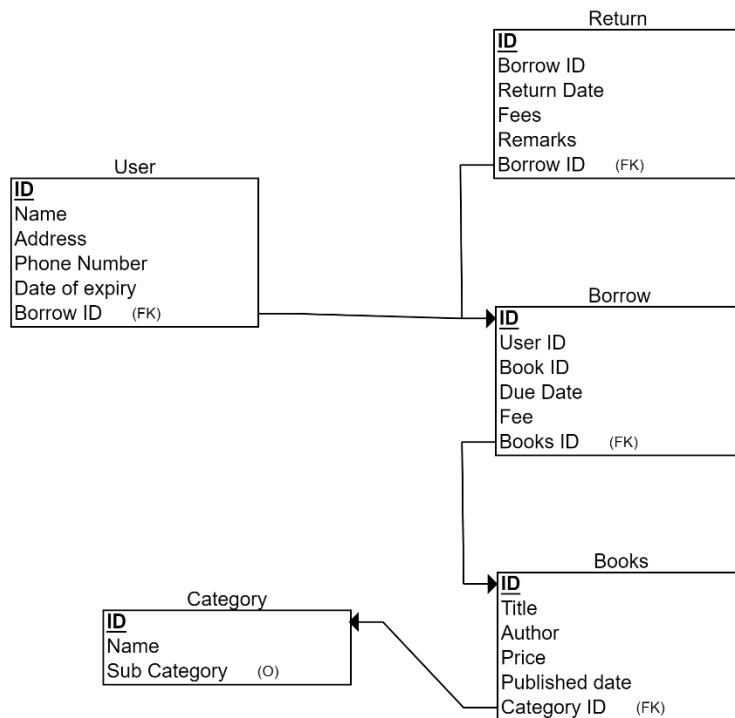


Name: Adithya M SRN: PES1UG20CS621 Section: K
DBT Assignment 1

ER Diagram:



Relational Schema:



Tables:

SELECT * FROM books;

Showing rows 0 - 14 (15 total, Query took 0.0002 seconds.)

SELECT * FROM `books`

☐ Profiling [\[Edit inline \]](#) [\[Edit \]](#) [\[Explain SQL \]](#) [\[Create PHP code \]](#) [\[Refresh \]](#)

☐ Show all | Number of rows: 25 | Filter rows: Search this table | Sort by

Extra options

			id	title	author	price	publish_date	category_id
<input type="checkbox"/>						100	2019-12-31	1111
<input type="checkbox"/>				222	title2 author2	200	2020-10-01	2222
<input type="checkbox"/>				333	title3 author3	300	2013-03-03	3333
<input type="checkbox"/>				444	title4 author4	400	2001-04-03	4444
<input type="checkbox"/>				555	title5 author5	500	2009-02-02	1111
<input type="checkbox"/>				666	title6 author6	600	2010-01-03	2222
<input type="checkbox"/>				777	title7 author7	700	2011-04-05	3333
<input type="checkbox"/>				888	title8 author8	800	2012-05-06	4444
<input type="checkbox"/>				999	title9 author9	900	2013-06-07	1111
<input type="checkbox"/>				1000	title10 author10	1000	2014-07-08	2222
<input type="checkbox"/>				1111	title11 author11	1100	2015-08-09	3333
<input type="checkbox"/>				1222	title12 author12	1200	2016-09-10	4444
<input type="checkbox"/>				1333	title13 author13	1300	2017-10-11	1111
<input type="checkbox"/>				1444	title14 author14	1400	2018-11-12	2222
<input type="checkbox"/>				1555	title15 author15	1500	2019-12-13	3333

SELECT * FROM borrow;

SELECT * FROM `borrow`

☐ Profiling [\[Edit inline \]](#) [\[Edit \]](#) [\[Explain SQL \]](#) [\[Create PHP code \]](#) [\[Refresh \]](#)

☐ Show all | Number of rows: 25 | Filter rows: Search this table

Extra options

				id	user_id	book_id	due_date	fee
<input type="checkbox"/>				11	1	111	2022-02-02	100
<input type="checkbox"/>				22	2	222	2030-01-03	200
<input type="checkbox"/>				33	3	333	2021-04-05	300
<input type="checkbox"/>				44	4	444	2020-05-06	400
<input type="checkbox"/>				55	5	111	2022-02-02	100
<input type="checkbox"/>				66	6	222	2030-01-03	200
<input type="checkbox"/>				77	7	333	2021-04-05	300
<input type="checkbox"/>				88	8	444	2020-05-06	400
<input type="checkbox"/>				99	9	111	2022-02-02	100
<input type="checkbox"/>				100	10	222	2030-01-03	200
<input type="checkbox"/>				111	11	333	2021-04-05	300
<input type="checkbox"/>				122	12	444	2020-05-06	400
<input type="checkbox"/>				133	13	111	2022-02-02	100
<input type="checkbox"/>				144	14	222	2030-01-03	200
<input type="checkbox"/>				155	15	333	2021-04-05	300

Console

SELECT * FROM category;

SELECT

*

FROM

category

☐
Profiling
[Edit inline]
[Edit]
[Explain SQL]
[Create PHP code]
[Refresh]

☐
Show all

Number of rows:

25

Filter rows:

Search

Extra options

←

T

→

▼

				id	name	sub_category_id			
<input type="checkbox"/>		Edit		Copy		Delete	1111	name1	11111
<input type="checkbox"/>		Edit		Copy		Delete	2222	name2	22222
<input type="checkbox"/>		Edit		Copy		Delete	3333	name3	33333
<input type="checkbox"/>		Edit		Copy		Delete	4444	name4	44444
<input type="checkbox"/>		Edit		Copy		Delete	5555	name5	55555
<input type="checkbox"/>		Edit		Copy		Delete	6666	name6	66666
<input type="checkbox"/>		Edit		Copy		Delete	7777	name7	77777
<input type="checkbox"/>		Edit		Copy		Delete	8888	name8	88888
<input type="checkbox"/>		Edit		Copy		Delete	9999	name9	99999
<input type="checkbox"/>		Edit		Copy		Delete	10000	name10	100000
<input type="checkbox"/>		Edit		Copy		Delete	11111	name11	111111
<input type="checkbox"/>		Edit		Copy		Delete	12222	name12	122222
<input type="checkbox"/>		Edit		Copy		Delete	13333	name13	133333
<input type="checkbox"/>		Edit		Copy		Delete	14444	name14	144444
<input type="checkbox"/>		Edit		Copy		Delete	15555	name15	155555

SELECT * FROM returns;

Showing rows 0 - 14 (15 total, Query took 0.0002 seconds.)

SELECT * FROM `returns`

☐ Profiling [\[Edit inline \]](#) [\[Edit \]](#) [\[Explain SQL \]](#) [\[Create PHP code \]](#) [\[Refresh \]](#)

☐ Show all | Number of rows: 25 | Filter rows: Search this table

Extra options

				id	borrow_id	return_date	fees	remarks
<input type="checkbox"/>				111	11	2022-02-02	100	remarks1
<input type="checkbox"/>				222	22	2030-01-03	200	remarks2
<input type="checkbox"/>				333	33	2021-04-05	300	remarks3
<input type="checkbox"/>				444	44	2020-05-06	400	remarks4
<input type="checkbox"/>				555	55	2022-02-02	100	remarks5
<input type="checkbox"/>				666	66	2030-01-03	200	remarks6
<input type="checkbox"/>				777	77	2021-04-05	300	remarks7
<input type="checkbox"/>				888	88	2020-05-06	400	remarks8
<input type="checkbox"/>				999	99	2022-02-02	100	remarks9
<input type="checkbox"/>				1000	100	2030-01-03	200	remarks10
<input type="checkbox"/>				1111	111	2021-04-05	300	remarks11
<input type="checkbox"/>				1222	122	2020-05-06	400	remarks12
<input type="checkbox"/>				1333	133	2022-02-02	100	remarks13
<input type="checkbox"/>				1444	144	2030-01-03	200	remarks14
<input type="checkbox"/>				1555	155	2021-04-05	300	remarks15

SELECT * FROM user;

Showing rows 0 - 14 (15 total, Query took 0.0002 seconds.)

```
SELECT * FROM `user`
```

☐ Profiling [\[Edit inline \]](#) [\[Edit \]](#) [\[Explain SQL \]](#) [\[Create PHP code \]](#) [\[Refresh \]](#)

☐ Show all | Number of rows: 25 | Filter rows: Search this table | Sort

Extra options

	id	address	phone_no	date_of_expiry	borrow_id
<input type="checkbox"/> Edit Copy Delete	1	address1	1234567890	2019-12-31	11
<input type="checkbox"/> Edit Copy Delete	2	address2	2147483647	2020-10-01	22
<input type="checkbox"/> Edit Copy Delete	3	address3	2147483647	2013-03-03	33
<input type="checkbox"/> Edit Copy Delete	4	address4	2147483647	2001-04-03	44
<input type="checkbox"/> Edit Copy Delete	5	address5	1234567890	2009-02-02	55
<input type="checkbox"/> Edit Copy Delete	6	address6	2147483647	2010-01-03	66
<input type="checkbox"/> Edit Copy Delete	7	address7	2147483647	2011-04-05	77
<input type="checkbox"/> Edit Copy Delete	8	address8	2147483647	2012-05-06	88
<input type="checkbox"/> Edit Copy Delete	9	address9	1234567890	2013-06-07	99
<input type="checkbox"/> Edit Copy Delete	10	address10	2147483647	2014-07-08	100
<input type="checkbox"/> Edit Copy Delete	11	address11	2147483647	2015-08-09	111
<input type="checkbox"/> Edit Copy Delete	12	address12	2147483647	2016-09-10	122
<input type="checkbox"/> Edit Copy Delete	13	address13	1234567890	2017-10-11	133
<input type="checkbox"/> Edit Copy Delete	14	address14	2147483647	2018-11-12	144
<input type="checkbox"/> Edit Copy Delete	15	address15	2147483647	2019-12-13	155

Creating indices

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0005 seconds.)

```
create index category_name_index on category(name);
```

[\[Edit inline \]](#) [\[Edit \]](#) [\[Create PHP code \]](#)

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0005 seconds.)

```
CREATE INDEX books_title_index ON books(title);
```

[\[Edit inline \]](#) [\[Edit \]](#) [\[Create PHP code \]](#)

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0004 seconds.)

```
CREATE INDEX books_author_index ON books(author);
```

[\[Edit inline \]](#) [\[Edit \]](#) [\[Create PHP code \]](#)

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0004 seconds.)

```
CREATE index borrow_user_id_index on borrow(user_id);
```

[\[Edit inline \]](#) [\[Edit \]](#) [\[Create PHP code \]](#)

MySQL returned an empty result set (i.e. zero rows). (Query took 0.0005 seconds.)

```
CREATE index user_address_index on user(address);
```

[\[Edit inline \]](#) [\[Edit \]](#) [\[Create PHP code \]](#)

Queries

1) `SELECT b.title, b.author FROM books b JOIN category c ON b.category_id = c.id WHERE c.name = 'name1';`

Without index:

Your SQL query has been executed successfully.

```
EXPLAIN SELECT b.title, b.author FROM books b JOIN category c ON b.category_id = c.id WHERE c.name = 'name1';
```

[Edit inline] [Edit] [Skip Explain SQL] [Analyze Explain at mariadb.org] [Create PHP code]

Extra options

id	select_type	table	type	possible_keys	key	key_len	ref	rows	Extra
1	SIMPLE	b	ALL	NULL	NULL	NULL	NULL	15	Using where
1	SIMPLE	c	eq_ref	PRIMARY	PRIMARY	4	library.b.category_id	1	Using where

Query results operations

With Index:

Your SQL query has been executed successfully.

```
EXPLAIN SELECT b.title, b.author FROM books b JOIN category c ON b.category_id = c.id WHERE c.name = 'name1';
```

[Edit inline] [Edit] [Skip Explain SQL] [Analyze Explain at mariadb.org] [Create PHP code]

Extra options

id	select_type	table	type	possible_keys	key	key_len	ref	rows	Extra
1	SIMPLE	c	ref	PRIMARY,category_name_index	category_name_index	203	const	1	Using where; Using index
1	SIMPLE	b	ref	category_id	category_id	5	library.c.id	1	

Query results operations

2) `SELECT * FROM borrow WHERE user_id = 111 AND book_id between 1 and 110;`

Without index:

Your SQL query has been executed successfully.

```
EXPLAIN SELECT * FROM borrow WHERE user_id = 111 AND book_id between 1 and 110;
```

[Edit inline] [Edit] [Skip Explain SQL] [Analyze Explain at mariadb.org] [Create PHP code]

Extra options

id	select_type	table	type	possible_keys	key	key_len	ref	rows	Extra
1	SIMPLE	borrow	ALL	NULL	NULL	NULL	NULL	15	Using where

Query results operations

With index

Your SQL query has been executed successfully.

```
EXPLAIN SELECT * FROM borrow WHERE user_id = 111 AND book_id between 1 and 110;
```

[[Edit inline](#)] [[Edit](#)] [[Skip Explain SQL](#)] [[Analyze Explain at mariadb.org](#)] [[Create PHP code](#)]

Extra options

id	select_type	table	type	possible_keys	key	key_len	ref	rows	Extra
1	SIMPLE	borrow	ref	borrow_user_id_index	borrow_user_id_index	5	const	1	Using where

3) SELECT * FROM returns WHERE borrow_id IN (SELECT id FROM borrow WHERE user_id = 111 AND book_id between 1 and 110);

Without index:

Your SQL query has been executed successfully.

```
EXPLAIN SELECT * FROM returns WHERE borrow_id IN (SELECT id FROM borrow WHERE user_id = 111 AND book_id between 1 and 110);
```

[[Edit inline](#)] [[Edit](#)] [[Skip Explain SQL](#)] [[Analyze Explain at mariadb.org](#)] [[Create PHP code](#)]

Extra options

id	select_type	table	type	possible_keys	key	key_len	ref	rows	Extra
1	PRIMARY	returns	ALL	NULL	NULL	NULL	NULL	15	Using where
1	PRIMARY	borrow	eq_ref	PRIMARY	PRIMARY	4	library.returns.borrow_id	1	Using where

With index:

Your SQL query has been executed successfully.

```
EXPLAIN SELECT * FROM returns WHERE borrow_id IN (SELECT id FROM borrow WHERE user_id = 111 AND book_id between 1 and 110);
```

[[Edit inline](#)] [[Edit](#)] [[Skip Explain SQL](#)] [[Analyze Explain at mariadb.org](#)] [[Create PHP code](#)]

Extra options

id	select_type	table	type	possible_keys	key	key_len	ref	rows	Extra
1	PRIMARY	borrow	ref	PRIMARY,book_id,borrow_user_id_index	borrow_user_id_index	5	const	1	Using where
1	PRIMARY	returns	ref	borrow_id	borrow_id	5	library.borrow.id	1	

4) SELECT * FROM books WHERE price/5 > 100 AND price/5 < 200;

Without optimization (index present):

Your SQL query has been executed successfully.

```
EXPLAIN SELECT * FROM books WHERE price/5 > 100 AND price/5 < 200;
```

[Edit inline] [Edit] [Skip Explain SQL] [Analyze Explain at mariadb.org] [Create PHP code]

Extra options

id	select_type	table	type	possible_keys	key	key_len	ref	rows	Extra
1	SIMPLE	books	ALL	NULL	NULL	NULL	NULL	15	Using where

Query results operations

Print Copy to clipboard Create view

With optimization (index present):

SELECT * FROM books WHERE price > 500 AND price < 1000;

Your SQL query has been executed successfully.

```
EXPLAIN SELECT * FROM books WHERE price > 500 AND price < 1000;
```

[Edit inline] [Edit] [Skip Explain SQL] [Analyze Explain at mariadb.org] [Create PHP code]

Extra options

id	select_type	table	type	possible_keys	key	key_len	ref	rows	Extra
1	SIMPLE	books	ALL	books_price_index	NULL	NULL	NULL	15	Using where

Query results operations

Print Copy to clipboard Create view

5) SELECT * FROM books WHERE YEAR(publish_date) = 2022;

Without index and optimisation:

Your SQL query has been executed successfully.

```
EXPLAIN SELECT * FROM books WHERE YEAR(publish_date) = 2022;
```

[Edit inline] [Edit] [Skip Explain SQL] [Analyze Explain at mariadb.org] [Create PHP code]

Extra options

id	select_type	table	type	possible_keys	key	key_len	ref	rows	Extra
1	SIMPLE	books	ALL	NULL	NULL	NULL	NULL	15	Using where

Creating index: CREATE INDEX books_publish_date_index ON books(publish_date);

Show query box

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0004 seconds.)

```
CREATE INDEX books_publish_date_index ON books(publish_date);
```

[Edit inline] [Edit] [Create PHP code]

Optimised query: `SELECT * FROM books WHERE publish_date >= '2022-01-01' AND publish_date < '2023-01-01';`

Your SQL query has been executed successfully.

[EXPLAIN](#) `SELECT * FROM books WHERE publish_date >= '2022-01-01' AND publish_date < '2023-01-01';`

[\[Edit inline \]](#) [\[Edit \]](#) [\[Skip Explain SQL \]](#) [\[Analyze Explain at mariadb.org \]](#) [\[Create PHP code \]](#)

Extra options

id	select_type	table	type	possible_keys	key	key_len	ref	rows	Extra
1	SIMPLE	books	range	books_publish_date_index	books_publish_date_index	4	NULL	1	Using index condition