

CS 164

- 1) cs164.net/lottery by 6pm today
- 2) hear back via email tomorrow
- 3) if lotteried in
 - email will explain when/where to get signature for study card
 - email will explain what to do for next week (teams, homework, etc.)

projects

SQL

Workbook1

100% Search in Sheet

Home Layout Tables Charts SmartArt Formulas Data Review

Edit Font Alignment Number Format Cells Themes

Paste Calibri (Body) 12 abc Wrap Text General Conditional Formatting Styles Actions Themes Aa

A1

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Sheet1 +

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localhost / localhost | x

localhost/phpMyAdmin/

phpMyAdmin

(Recent tables) ...

Server: localhost

Databases SQL Status Users Export Import More

General Settings

[Change password](#)

Server connection collation : utf8_unicode_ci

Appearance Settings

Language : English

Theme: pmahomme

- Font size: 82%

[More settings](#)

Database server

- Server: Localhost via UNIX socket
- Software: MariaDB
- Software version: 5.5.32-MariaDB - MariaDB Server
- Protocol version: 10
- User: jharvard@localhost
- Server charset: UTF-8 Unicode (utf8)

Web server

- Apache/2.4.6 (Fedora)
- Database client version: libmysql - mysqlnd 5.0.11-dev - 20120503 - \$Id: 40933630edef551dfaca71298a83fad8 \$
- PHP extension: mysqli
- [Show PHP information](#)

Terminal

File Edit View Terminal Tabs Help

jharvard@appliance (~): mysql -u jharvard -p

Enter password:

Welcome to the MariaDB monitor. Commands end with ; or \g.**Your MariaDB connection id is 1021****Server version: 5.5.32-MariaDB MariaDB Server****Copyright (c) 2000, 2013, Oracle, Monty Program Ab and others.****Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.**

MariaDB [(none)]> █

MariaDB [courses50]> DESCRIBE courses;

Field	Type	Null	Key	Default	Extra
id	int(10) unsigned	NO	PRI	NULL	auto_increment
name	varchar(255)	NO		NULL	

MariaDB [courses50]> DESCRIBE instructors;

Field	Type	Null	Key	Default	Extra
id	int(11)	NO	PRI	NULL	auto_increment
name	varchar(255)	NO		NULL	

MariaDB [courses50]> DESCRIBE course_instructor;

Field	Type	Null	Key	Default	Extra
course_id	int(10) unsigned	NO	MUL	NULL	
instructor_id	int(10) unsigned	NO		NULL	

```
MariaDB [courses50]> SELECT * FROM courses;
```

id	name
1	CS1
2	CS50
3	CS51

```
MariaDB [courses50]> SELECT * FROM instructors;
```

id	name
1	Leitner
2	Malan
3	Tov

```
MariaDB [courses50]> SELECT * FROM course_instructor;
```

course_id	instructor_id
1	1
2	2
3	1
3	3


```
MariaDB [courses50]> SELECT * FROM courses
-> JOIN course_instructor ON courses.id = course_instructor.course_id
-> JOIN instructors ON course_instructor.instructor_id = instructors.id;
```

id	name	course_id	instructor_id	id	name
1	CS1	1	1	1	Leitner
3	CS51	3	1	1	Leitner
2	CS50	2	2	2	Malan
3	CS51	3	3	3	Tov

indexes

- PRIMARY
- INDEX
- UNIQUE
- FULLTEXT

Table 14.1. Storage Engines Feature Summary

Feature	MyISAM	Memory	InnoDB	Archive	NDB
Storage limits	256TB	RAM	64TB	None	384EB
Transactions	No	No	Yes	No	Yes
Locking granularity	Table	Table	Row	Table	Row
MVCC	No	No	Yes	No	No
Geospatial data type support	Yes	No	Yes	Yes	Yes
Geospatial indexing support	Yes	No	No	No	No
B-tree indexes	Yes	Yes	Yes	No	No
T-tree indexes	No	No	No	No	Yes
Hash indexes	No	Yes	No [a]	No	Yes
Full-text search indexes	Yes	No	Yes [b]	No	No
Clustered indexes	No	No	Yes	No	No
Data caches	No	N/A	Yes	No	Yes
Index caches	Yes	N/A	Yes	No	Yes
Compressed data	Yes [c]	No	Yes [d]	Yes	No
Encrypted data [e]	Yes	Yes	Yes	Yes	Yes
Cluster database support	No	No	No	No	Yes
Replication support [f]	Yes	Yes	Yes	Yes	Yes
Foreign key support	No	No	Yes	No	No
Backup / point-in-time recovery [g]	Yes	Yes	Yes	Yes	Yes
Query cache support	Yes	Yes	Yes	Yes	Yes
Update statistics for data dictionary	Yes	Yes	Yes	Yes	Yes

race conditions



atomicity

```
INSERT INTO table (id, symbol, shares) VALUES(7, 'DVN.V', 10) ON  
DUPLICATE KEY UPDATE shares = shares + VALUES(shares)
```

locks

```
LOCK TABLES portfolio WRITE;  
SELECT balance FROM account WHERE number = 2;  
UPDATE account SET balance = 1500 WHERE number = 2;  
UNLOCK TABLES;
```

transactions

```
START TRANSACTION;  
UPDATE account SET balance = balance - 1000 WHERE number = 2;  
UPDATE account SET balance = balance + 1000 WHERE number = 1;  
COMMIT;
```

transactions

```
START TRANSACTION;  
UPDATE account SET balance = balance - 1000 WHERE number = 2;  
UPDATE account SET balance = balance + 1000 WHERE number = 1;  
SELECT balance FROM account WHERE number = 2;  
# suppose account #2 now has a negative balance  
ROLLBACK;
```