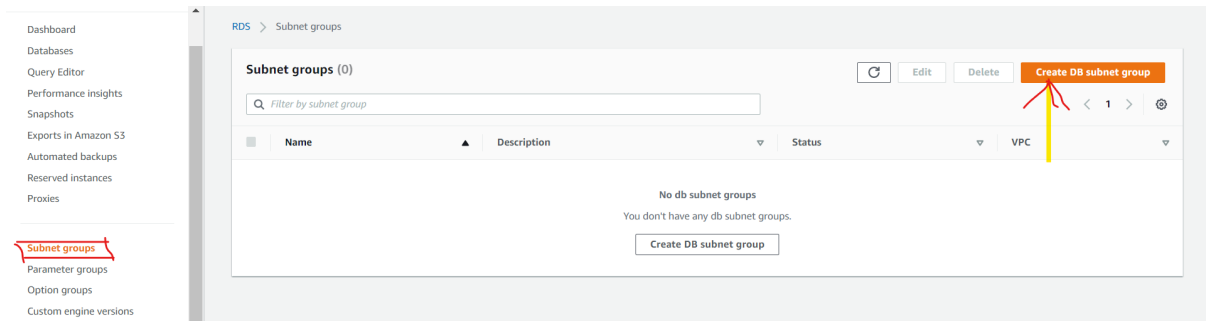


Creating RDS instance (mysql database)

>>> The prerequisite for rds creation is subnet group

1. Create subnet group

- Goto rds service and goto subnet group in the left side of the navigation pane and click on create db subnet group



- Give name for subnet group and select the custom vpc

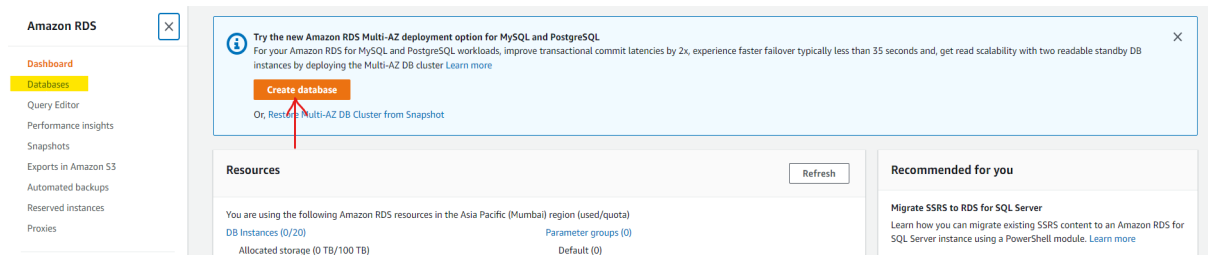
The screenshot shows the 'Create DB subnet group' form. It has three main sections: 'Name', 'Description', and 'VPC'. The 'Name' field contains 'rds-subnet-group'. The 'Description' field contains 'for rds'. The 'VPC' dropdown is set to 'my-vpc-01 (vpc-022004376fc125859)'. A red arrow points to the 'Create DB subnet group' button.

- Select the az and data subnets and then click on create

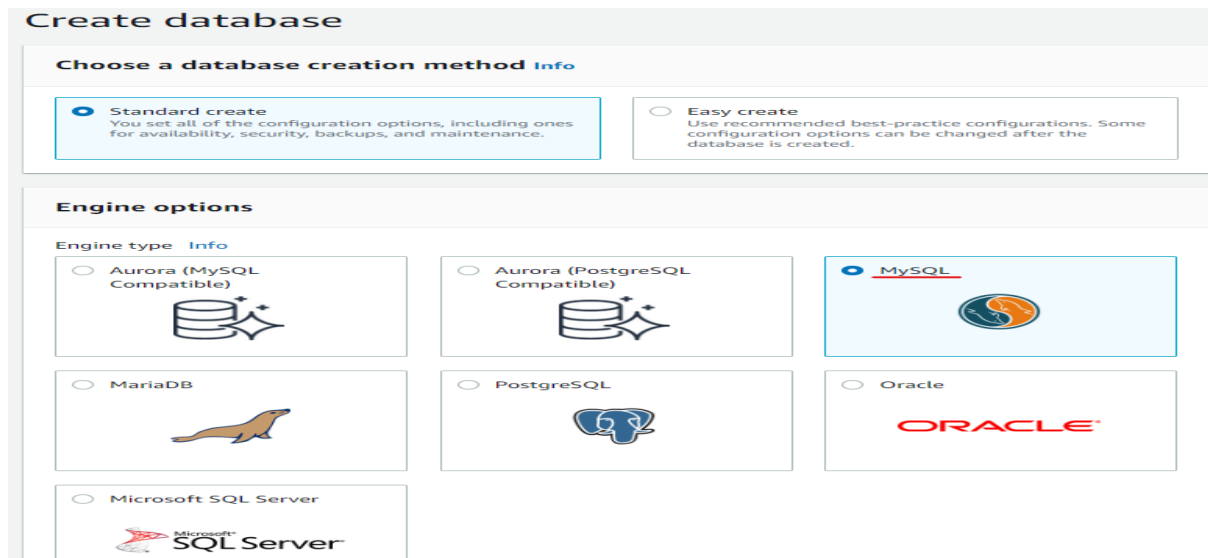
The screenshot shows the 'Add subnets' form. It has two main sections: 'Availability Zones' and 'Subnets'. Under 'Availability Zones', three zones are selected: 'ap-south-1a', 'ap-south-1b', and 'ap-south-1c'. Under 'Subnets', three subnets are selected: 'subnet-04811ccfea9722d44 (10.0.208.0/21)', 'subnet-0e0ea2fb7e3226fd0 (10.0.200.0/21)', and 'subnet-0770dcfa9a2f93b2e (10.0.192.0/21)'. A table at the bottom shows the selected subnets. A red arrow points to the 'Create' button.

Availability zone	Subnet ID	CIDR block
ap-south-1a	subnet-0770dcfa9a2f93b2e	10.0.192.0/21
ap-south-1b	subnet-0e0ea2fb7e3226fd0	10.0.200.0/21
ap-south-1c	subnet-04811ccfea9722d44	10.0.208.0/21

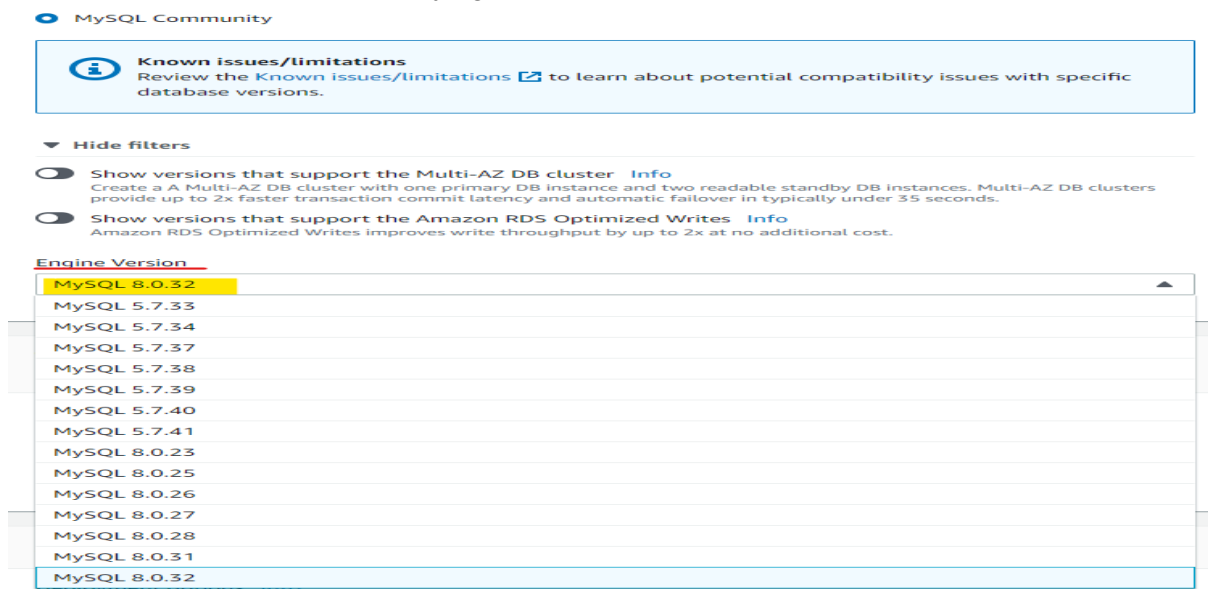
2. Goto the rds service and click on create database



a. Select the database(now i am going with mysql)



b. Choose the version. Always go with the latest version



c. Select the production in the templates and single db instance for cost optimization. If u go multi-az db cluster or multi-az db instance,db instances may create across the zones so u may get a lot of charge because rds is a highly chargeable component in the aws because of storage. So for now go with single db instance which will create in a single instance

Templates

Choose a sample template to meet your use case.



Production

Use defaults for high availability and fast, consistent performance.



Dev/Test

This instance is intended for development use outside of a production environment.



Free tier

Use RDS Free Tier to develop new applications, test existing applications, or gain hands-on experience with Amazon RDS. [Info](#)

Availability and durability

Deployment options [Info](#)

The deployment options below are limited to those supported by the engine you selected above.



Multi-AZ DB Cluster - *new*

Creates a DB cluster with a primary DB instance and two readable standby DB instances, with each DB instance in a different Availability Zone (AZ). Provides high availability, data redundancy and increases capacity to serve read workloads.



Multi-AZ DB instance

Creates a primary DB instance and a standby DB instance in a different AZ. Provides high availability and data redundancy, but the standby DB instance doesn't support connections for read workloads.



Single DB instance

Creates a single DB instance with no standby DB instances.

- d. In the settings options choose a name for ur database and by default aws will give u a user called master user give a name it or u can go with default,if u want to store the credentials of master user u can enable manage master credentials in aws secrets manager. It will store master credentials (for don't choose it) and if you want to go with the auto password enable auto generate a password.It will give a password after the creation of rds. Here i'm going with the custom password.

Settings

DB instance identifier [Info](#)

Type a name for your DB instance. The name must be unique across all DB instances owned by your AWS account in the current AWS Region.

mysql-rds

The DB instance identifier is case-insensitive, but is stored as all lowercase (as in "mydbinstance"). Constraints: 1 to 60 alphanumeric characters or hyphens. First character must be a letter. Can't contain two consecutive hyphens. Can't end with a hyphen.

▼ Credentials Settings

Master username [Info](#)

Type a login ID for the master user of your DB instance.

master-user

1 to 16 alphanumeric characters. First character must be a letter.



Manage master credentials in AWS Secrets Manager

Manage master user credentials in Secrets Manager. RDS can generate a password for you and manage it throughout its lifecycle.



If you manage the master user credentials in Secrets Manager, some RDS features aren't supported.

[Learn more](#)



Auto generate a password

Amazon RDS can generate a password for you, or you can specify your own password.

Master password [Info](#)

.....

Constraints: At least 8 printable ASCII characters. Can't contain any of the following: / (slash), ' (single quote), " (double quote) and @ (at sign).

Confirm master password [Info](#)

.....

- e. Select the instance type

Instance configuration

The DB instance configuration options below are limited to those supported by the engine that you selected above.



Amazon RDS Optimized Writes - *new* [Info](#)



Show instance classes that support Amazon RDS Optimized Writes

DB instance class [Info](#)



Standard classes (includes m classes)



Memory optimized classes (includes r and x classes)



Burstable classes (includes t classes)

db.m5.2xlarge

8 vCPUs 32 GiB RAM Network: 4,750 Mbps

Q

db.m5.large

2 vCPUs 8 GiB RAM Network: 4,750 Mbps

db.m5.xlarge

4 vCPUs 16 GiB RAM Network: 4,750 Mbps

db.m5.2xlarge

8 vCPUs 32 GiB RAM Network: 4,750 Mbps

db.m5.4xlarge

16 vCPUs 64 GiB RAM Network: 4,750 Mbps

db.m5.8xlarge

32 vCPUs 128 GiB RAM Network: 4,750 Mbps

- f. In the storage select the storage type like instance ebs volume types it will have types choose any one and enable autoscaling so that if the selected consumed it will allocate extra data automatically

Storage

Storage type [Info](#)

General Purpose SSD (gp3)

Performance scales independently from storage

Allocated storage [Info](#)

200

GiB

Minimum: 20 GiB. Maximum: 65,536 GiB

► Advanced settings

Baseline IOPS of 3,000 IOPS and storage throughput of 125 MiBps are included for allocated storage less than 400 GiB.

Storage autoscaling [Info](#)

Provides dynamic scaling support for your database's storage based on your application's needs.

☒ Enable storage autoscaling

Enabling this feature will allow the storage to increase after the specified threshold is exceeded.

Maximum storage threshold [Info](#)

Charges will apply when your database autoscales to the specified threshold

1000

GiB

The minimum value is 220 GiB and the maximum value is 65,536 GiB

- g. In the connectivity section go with manual connection to ec2 and select the custom vpc and automatically subnet group will come

Connectivity [Info](#)

Compute resource

Choose whether to set up a connection to a compute resource for this database. Setting up a connection will automatically change connectivity settings so that the compute resource can connect to this database.

☒ Don't connect to an EC2 compute resource

Don't set up a connection to a compute resource for this database. You can manually set up a connection to a compute resource later.

☐ Connect to an EC2 compute resource

Set up a connection to an EC2 compute resource for this database.

Network type [Info](#)

To use dual-stack mode, make sure that you associate an IPv6 CIDR block with a subnet in the VPC you specify.

☒ IPv4

Your resources can communicate only over the IPv4 addressing protocol.

☐ Dual-stack mode

Your resources can communicate over IPv4, IPv6, or both.

Virtual private cloud (VPC) [Info](#)

Choose the VPC. The VPC defines the virtual networking environment for this DB instance.

my-vpc-01 (vpc-022004376fc125859)

Only VPCs with a corresponding DB subnet group are listed.

ⓘ After a database is created, you can't change its VPC.

DB subnet group [Info](#)

Choose the DB subnet group. The DB subnet group defines which subnets and IP ranges the DB instance can use in the VPC that you selected.

rds-subnet-group

Public access [Info](#)

☐ Yes

RDS assigns a public IP address to the database. Amazon EC2 instances and other resources outside of the VPC can connect to your database. Resources inside the VPC can also connect to the database. Choose one or more VPC security groups that specify which resources can connect to the database.

☒ No

RDS doesn't assign a public IP address to the database. Only Amazon EC2 instances and other resources inside the VPC can connect to your database. Choose one or more VPC security groups that specify which resources can connect to the database.

VPC security group (firewall) [Info](#)

Choose one or more VPC security groups to allow access to your database. Make sure that the security group rules allow the appropriate incoming traffic.

☒ Choose existing

Choose existing VPC security groups

☐ Create new

Create new VPC security group

Existing VPC security groups

Choose one or more options

default X

Availability Zone [Info](#)

No preference

RDS Proxy

RDS Proxy is a fully managed, highly available database proxy that improves application scalability, resiliency, and security.

☐ Create an RDS Proxy [Info](#)

RDS automatically creates an IAM role and a Secrets Manager secret for the proxy. RDS Proxy has additional costs. For more information, see [Amazon RDS Proxy pricing](#).

Certificate authority - optional [Info](#)

Using a server certificate provides an extra layer of security by validating that the connection is being made to an Amazon database. It does so by checking the server certificate that is automatically installed on all databases that you provision.

rds-ca-2019 (default)

If you don't select a certificate authority, RDS chooses one for you.

► Additional configuration

Never allow rds to public and sg will be able to modify later also so for now go with default sg

h. Go with password authentication

Database authentication

Database authentication options [Info](#)

☒ Password authentication
Authenticates using database passwords.

☐ Password and IAM database authentication
Authenticates using the database password and user credentials through AWS IAM users and roles.

☐ Password and Kerberos authentication
Choose a directory in which you want to allow authorized users to authenticate with this DB instance using Kerberos Authentication.

i. Monitoringin the retention period always go with the maximum one

Monitoring

Performance Insights [Info](#)

Enabling Performance Insights will automatically enable the MySQL Community performance schema. [Learn more](#)

☒ Turn on Performance Insights [Info](#)

Retention period [Info](#)

7 days (free tier)

AWS KMS key [Info](#)

(default) aws/rds

Account
419740680543

KMS key ID
alias/aws/rds

You can't change the KMS key after enabling Performance Insights.

► Additional configuration
Enhanced Monitoring

j. Give the database name

▼ Additional configuration

Database options, encryption turned on, backup turned on, backtrack turned off, maintenance, CloudWatch Logs, delete protection turned on.

Database options

Initial database name [Info](#)

mysql-rds

If you do not specify a database name, Amazon RDS does not create a database.

DB parameter group [Info](#)

default.mysql8.0


Option group [Info](#)

default:mysql-8-0

k. Backup settings set work off timings

Backup

- ☒ **Enable automated backups**
Creates a point-in-time snapshot of your database

 Please note that automated backups are currently supported for InnoDB storage engine only. If you are using MyISAM, refer to details [here](#).

Backup retention period [Info](#)

The number of days (1–35) for which automatic backups are kept.

7 days

Backup window [Info](#)

The daily time range (in UTC) during which RDS takes automated backups.

- ☒ Choose a window
☐ No preference

Start time

00 : 19 UTC

Duration

0.5 hours

- ☒ Copy tags to snapshots

Backup replication [Info](#)

- ☐ **Enable replication in another AWS Region**
Enabling replication automatically creates backups of your DB instance in the selected Region, for disaster recovery, in addition to the current Region.

l. encryption

Encryption

- ☒ **Enable encryption**
Choose to encrypt the given instance. Master key IDs and aliases appear in the list after they have been created using the AWS Key Management Service console. [Info](#)

AWS KMS key [Info](#)

(default) aws/rds

Account

419740680543

KMS key ID

alias/aws/rds

Log exports


Select the log types to publish to Amazon CloudWatch Logs

- ☐ Audit log
☐ Error log
☐ General log
☐ Slow query log

IAM role

The following service-linked role is used for publishing logs to CloudWatch Logs.

RDS service-linked role

 Ensure that general, slow query, and audit logs are turned on. Error logs are enabled by default. [Learn more](#)

Maintenance

Auto minor version upgrade [Info](#)

- ☒ **Enable auto minor version upgrade**
Enabling auto minor version upgrade will automatically upgrade to new minor versions as they are released. The automatic upgrades occur during the maintenance window for the database.

Maintenance window [Info](#)

Select the period you want pending modifications or maintenance applied to the database by Amazon RDS.

- ☒ Choose a window
☐ No preference

Start day

Monday

Start time


19 : 00 UTC

Duration

0.5 hours

Deletion protection

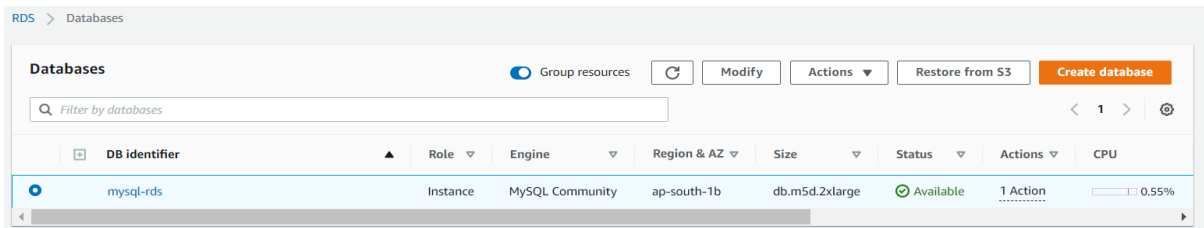
- ☒ **Enable deletion protection**
Protects the database from being deleted accidentally. While this option is enabled, you can't delete the database.

 You are responsible for ensuring that you have all of the necessary rights for any third-party products or services that you use with AWS services.

Cancel

Create database

Now the rds is created successfully



Now try to connect to rds from local

```
C:\Users\Anil>telnet mysql-rds.ct3ipxrkwhfs.ap-south-1.rds.amazonaws.com "3306"
Connecting To mysql-rds.ct3ipxrkwhfs.ap-south-1.rds.amazonaws.com...Could not open connection
to the host, on port 3306: Connect failed
```

Local to private subnet we can't connect directly.

We can connect via ssh tunnelling (see the doc ssh tunnelling)

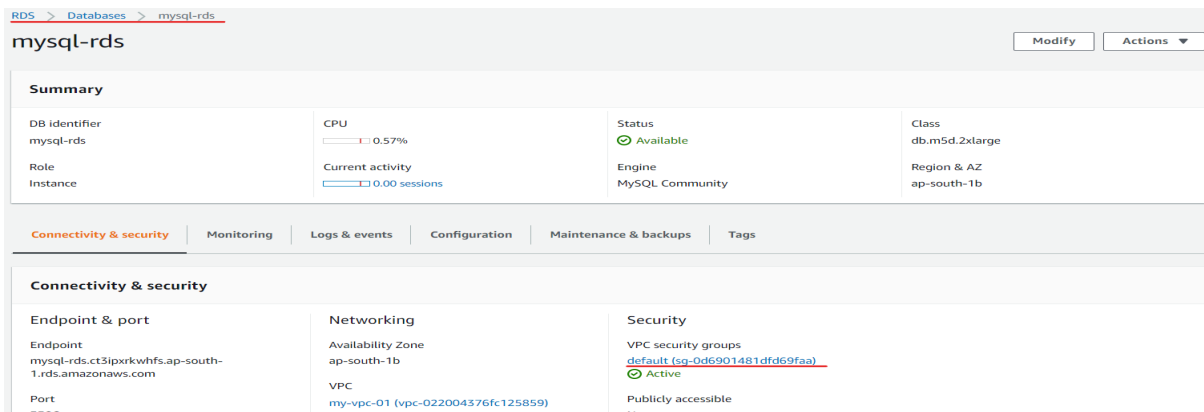
Or

We can connect from the bastion. Try from bastion

```
[root@ip-10-0-221-181 ~]# telnet mysql-rds.ct3ipxrkwhfs.ap-south-1.rds.amazonaws.com 3306
Trying 10.0.207.129...
telnet: connect to address 10.0.207.129: Connection timed out
```

We have to allow 3306 from bastion for the connection

>>>goto the rds and select it in the connectivity and configuration section we have all details about the rds click on the security group id in the security column



Click on the sg it will take you to the sg and at there edit inbound rule allow 3306 from bastion-sg and try the same command again it will connect

```
sh-5.2$ telnet mysql-rds.ct3ipxrkwhfs.ap-south-1.rds.amazonaws.com 3306
Trying 10.0.207.129...
Connected to mysql-rds.ct3ipxrkwhfs.ap-south-1.rds.amazonaws.com.
Escape character is '^]'.
```

Well Telnet is saying just whether there is connectivity or not. Now we are confirmed connectivity is there from bastion to ec2.

Like ssh we need mysql client to connect to the rds.soo install mysql client in the bastion

To install mysql client run the following commands

```
sudo dnf update -y
```

```
sudo dnf install -y httpd wget php-fpm php-mysqli php-json php php-devel
```

```
sudo dnf install mariadb105-server -y
```

These commands will install the mysql client

Now mysql is there in the bastion. Connect with rds

```
mysql -h <rds endpoint> -u <username> -p
```

```
mysql -h mysql-rds.ct3ipxrkwfhs.ap-south-1.rds.amazonaws.com -u master_user -p
```

```
sh-5.2$ mysql -h mysql-rds.ct3ipxrkwfhs.ap-south-1.rds.amazonaws.com -u master_user -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MySQL connection id is 210
Server version: 8.0.32 Source distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MySQL [(none)]>
```

Now u r in the rds

Run some commands

show databases; -----gives the list of databases

create database <databaseName> -----creates a database

use <databaseName> -----enters into that database

show tables; -----shows tables

select * from <tableName> -----shows the columns and rows of the selected table

```
MySQL [(none)]> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| mysql_rds |
| performance_schema |
| sys |
+-----+
5 rows in set (0.002 sec)
```

```
MySQL [(none)]> create database test;
Query OK, 1 row affected (0.008 sec)
```

```
MySQL [(none)]> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| mysql_rds |
| performance_schema |
| sys |
| test |
+-----+
6 rows in set (0.001 sec)
```


Observe the outputs test database is created

```
MySQL [test]> use mysql;
```

Reading table information for completion of table and column names

You can turn off this feature to get a quicker startup with `-A`

Database changed

```
MySQL [mysql]> show tables;
```

```

Tables_in_mysql
columns_priv
component
db
default_roles
engine_cost
func
general_log
global_grants
gtid_executed
help_category
help_keyword
help_relation
help_topic
innodb_index_stats
innodb_table_stats
password_history
plugin
procs_priv
proxies_priv
rds_configuration
rds_global_status_history
rds_global_status_history_old
rds_heartbeat2
rds_history
rds_replication_status
rds_sysinfo
replication_asynchronous_connection_failover
replication_asynchronous_connection_failover_managed
replication_group_configuration_version
replication_group_member_actions
role_edges
server_cost
servers
slave_master_info
slave_relay_log_info
slave_worker_info
slow_log
tables_priv
time_zone
time_zone_leap_second
time_zone_name
time_zone_transition
time_zone_transition_type
user

```

```
MySQL [mysql]> select * from user;
```

[illegible]