



# Deploying your First Java Application to AWS -1 (Amazon RDS)

Hans-On Workshop | Digital Summit '18

## Miracle Innovation Labs

Miracle Software Systems, Inc.

## Deploying your First Java Application to AWS - 1 (Amazon RDS)

### Introduction

The goal of this document is to configure RDS service which is highly reliable relational database provided by AWS to store and retrieve records. In this document we will configure MySQL database service which acts as a back end for the application.

This guide was prepared by [Miracle's Innovation Labs!](#)

### Pre-Requisites

All attendees must have their workstation (with Internet) to participate in the workshop (both PC and MAC are compatible).

- Active email ID for registering with AWS
- Download and Install Microsoft .NET Framework
- Download and Install Microsoft Visual Studio
- Download and Install MySQL workbench
- Text Editor such as Sublime Text (or) Notepad ++

### Technology Involved

- AWS account
- Microsoft .NET Framework
- Microsoft Visual Studio
- MySQL Workbench

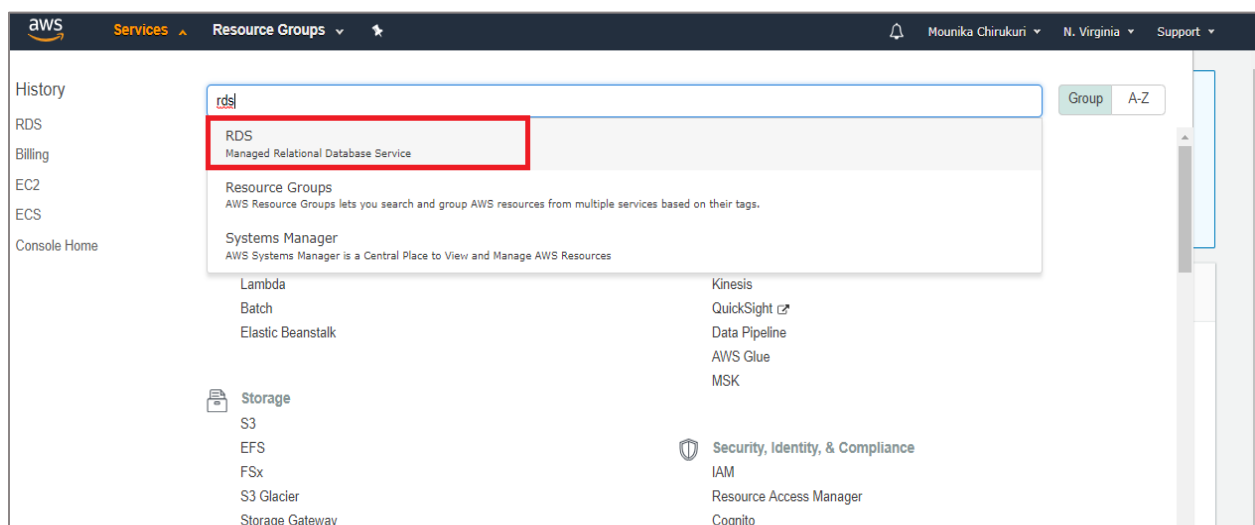
## Lab Steps

Let us get started with the workshop!

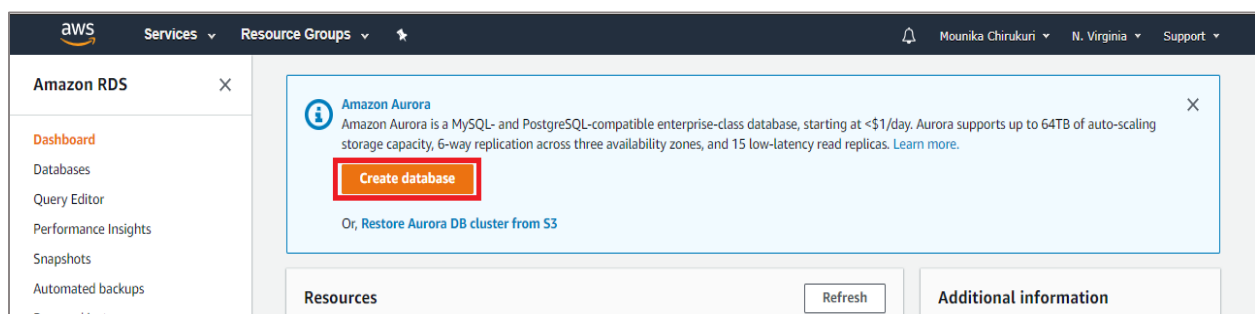
In this document, we will configure RDS with MySQL as our database along with required security group configurations and grab all the required details to configure the application like database connection string, database name, username, password and port. We will use those configuration details in application to communicate with the database and retrieve the required data.

### Step #1 | Database Creation using Amazon RDS

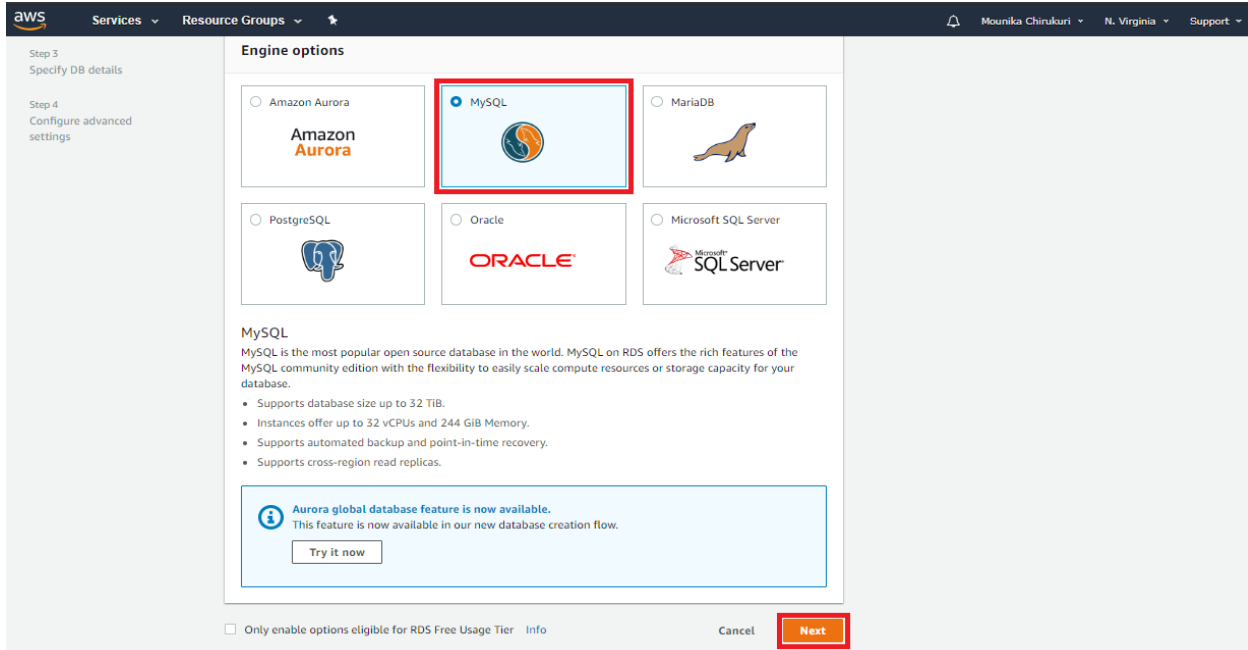
Go to AWS console and enter **RDS** in the search bar as shown below and select the RDS from the list of AWS services.



Amazon RDS opens a home page and then click on **Create database**.



Select **MySQL** as a database and click on **Next**.



Step 3  
Specify DB details

Step 4  
Configure advanced settings

### Engine options

☐ Amazon Aurora

☒ MySQL

☐ MariaDB

☐ PostgreSQL

☐ Oracle

☐ Microsoft SQL Server

**MySQL**  
MySQL is the most popular open source database in the world. MySQL on RDS offers the rich features of the MySQL community edition with the flexibility to easily scale compute resources or storage capacity for your database.

- Supports database size up to 32 TiB.
- Instances offer up to 32 vCPUs and 244 GiB Memory.
- Supports automated backup and point-in-time recovery.
- Supports cross-region read replicas.

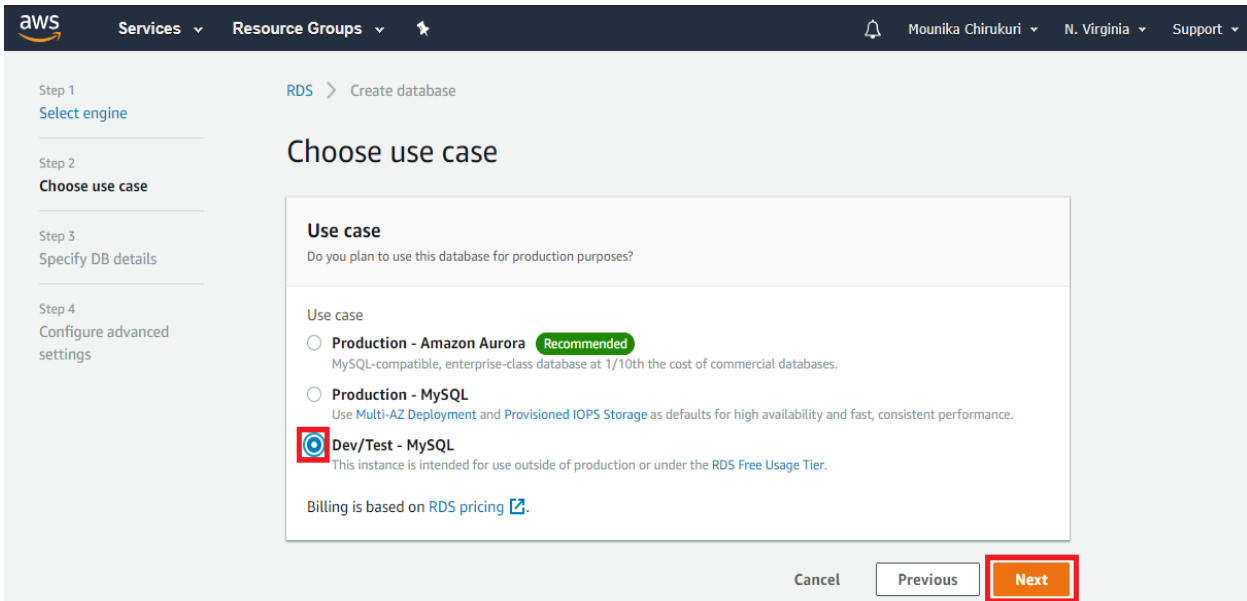
**Aurora global database feature is now available.**  
This feature is now available in our new database creation flow.

[Try it now](#)

☐ Only enable options eligible for RDS Free Usage Tier [Info](#)

[Cancel](#) [Next](#)

Choose the use case type as **Dev/Test-MySQL**, and click on **Next**.



Step 1  
[Select engine](#)

Step 2  
**Choose use case**

Step 3  
[Specify DB details](#)

Step 4  
[Configure advanced settings](#)

RDS > Create database

### Choose use case

**Use case**  
Do you plan to use this database for production purposes?

Use case

☐ **Production - Amazon Aurora** **Recommended**  
MySQL-compatible, enterprise-class database at 1/10th the cost of commercial databases.

☐ **Production - MySQL**  
Use Multi-AZ Deployment and Provisioned IOPS Storage as defaults for high availability and fast, consistent performance.

☒ **Dev/Test - MySQL**  
This instance is intended for use outside of production or under the [RDS Free Usage Tier](#).

Billing is based on [RDS pricing](#).

[Cancel](#) [Previous](#) [Next](#)

Specify **DB details** with select License model as **general-public-license** and **DB engine** version as **MySQL 5.6.40**.

aws Services Resource Groups Mounika Chirukuri N. Virginia Support

Step 1  
Select engine

Step 2  
Choose use case

Step 3  
Specify DB details

Step 4  
Configure advanced settings

RDS > Create database

## Specify DB details

**Instance specifications**  
Estimate your monthly costs for the DB Instance using the [AWS Simple Monthly Calculator](#)

DB engine  
MySQL Community Edition

License model [Info](#)  
general-public-license

DB engine version [Info](#)  
MySQL 5.6.40

[Known Issues/Limitations](#)  
Review the [Known Issues/Limitations](#) to learn about potential compatibility issues with specific database versions.

Select the option “Only enable options for RDS Free Usage Tier”. Select DB instance class as **db.t2.micro-1vCPU, 1GiB RAM**.

**Free tier**  
The Amazon RDS Free Tier provides a single db.t2.micro instance as well as up to 20 GiB of storage, allowing new AWS customers to gain hands-on experience with Amazon RDS. Learn more about the RDS Free Tier and the instance restrictions [here](#).

☒ Only enable options eligible for RDS Free Usage Tier [Info](#)

DB instance class [Info](#)  
db.t2.micro — 1 vCPU, 1 GiB RAM

Multi-AZ deployment [Info](#)  
☐ Create replica in different zone  
Creates a replica in a different Availability Zone (AZ) to provide data redundancy, eliminate I/O freezes, and minimize latency spikes during system backups.  
☐ No

Storage type [Info](#)  
General Purpose (SSD)

Allocated storage  
20 GiB  
(Minimum: 20 GiB, Maximum: 20 GiB) Higher allocated storage may improve IOPS performance.

Provide unique details for **DB instance identifier**, **Master username**, **Master password**, **Confirm password** and then click on **Next**.

### Settings

DB instance identifier [Info](#)

Specify a name that is unique for all DB instances owned by your AWS account in the current region.

DB instance identifier is case insensitive, but stored as all lower-case, as in "mydbinstance". Must contain from 1 to 63 alphanumeric characters or hyphens (1 to 15 for SQL Server). First character must be a letter. Cannot end with a hyphen or contain two consecutive hyphens.

Master username [Info](#)

Specify an alphanumeric string that defines the login ID for the master user.

Master Username must start with a letter. Must contain 1 to 16 alphanumeric characters.

Master password [Info](#)

Master Password must be at least eight characters long, as in "mypassword". Can be any printable ASCII character except "/", "", or "@".

Confirm password [Info](#)

Cancel

Previous

Next

In **Network&Security**, select Public accessibility as **yes** and Availability zone as **us-east-1a**, VPC security groups as **Choose existing security groups**.

### Network & Security

Virtual Private Cloud (VPC) [Info](#)  
VPC defines the virtual networking environment for this DB instance.

Default VPC (vpc-c3ece9bb)

Only VPCs with a corresponding DB subnet group are listed.

Subnet group [Info](#)  
DB subnet group that defines which subnets and IP ranges the DB instance can use in the VPC you selected.

default

Public accessibility [Info](#)

☒ Yes  
EC2 instances and devices outside of the VPC hosting the DB instance will connect to the DB instances. You must also select one or more VPC security groups that specify which EC2 instances and devices can connect to the DB instance.

☐ No  
DB instance will not have a public IP address assigned. No EC2 instance or devices outside of the VPC will be able to connect.

Availability zone [Info](#)

us-east-1a

VPC security groups  
Security groups have rules authorizing connections from all the EC2 instances and devices that need to access the DB instance.

☐ Create new VPC security group

☒ Choose existing VPC security groups

Choose VPC security groups

default X

In Database options, enter the **Database name** and leave the other fields as default values.

**Database options**

Database name [Info](#)

Note: if no database name is specified then no initial MySQL database will be created on the DB Instance.

Port [Info](#)  
TCP/IP port the DB instance will use for application connections.


DB parameter group [Info](#)

Option group [Info](#)


IAM DB authentication [Info](#)  
☐ Enable IAM DB authentication  
Manage your database user credentials through AWS IAM users and roles.  
☒ Disable

Leave the details for Encryption. Change the **Backup retention** period as **0 days**.

**Backup**

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

Backup retention period [Info](#)  
Select the number of days that Amazon RDS should retain automatic backups of this DB instance.

 A backup retention period of zero days will disable automated backups for this DB Instance.

Backup window [Info](#)  
☐ Select window  
☐ No preference  
☒ Copy tags to snapshots



In the **Maintenance section**, please click on the Radio button **Disable auto minor version upgrade** and **No preference** option in **Maintenance Window** and then click on **Create database**.

### Maintenance

Auto minor version upgrade [Info](#)

☐ Enable auto minor version upgrade  
Enables automatic upgrades to new minor versions as they are released. The automatic upgrades occur during the maintenance window for the DB instance.

☒ **Disable auto minor version upgrade**

Maintenance window [Info](#)  
Select the period in which you want pending modifications or patches applied to the DB instance by Amazon RDS.

☐ Select window

☒ **No preference**

### Deletion protection

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

[Cancel](#) [Previous](#) [Create database](#)

Select the database you have created earlier, you can see the details of the database.

aws

Services

Resource Groups

Mounika Chirukuri

N. Virginia

Support

Amazon RDS

Dashboard

Databases

Query Editor

Performance Insights

Snapshots

Automated backups

Reserved instances

RDS > Databases

Databases

Group resources

Modify

Actions

Restore from S3

Create database

Filter instances

DB Name	Role	Engine	Region & AZ	Size	Status	CPU	Current activi
<input checked="" type="radio"/> digitalsummit	Instance	MySQL	us-east-1a	db.t2.micro	Available	1.00%	0 Con

Copy the **Endpoint** of the database and save it for further purpose.

The screenshot shows the AWS Management Console for an Amazon RDS instance named 'digitalsummit'. The left sidebar contains navigation links for Dashboard, Databases, Query Editor, Performance Insights, Snapshots, Automated backups, Reserved instances, Subnet groups, Parameter groups, Option groups, Events, Event subscriptions, and Recommendations. The main content area displays the instance details under the 'digitalsummit' heading. The 'Summary' section shows the DB Name, CPU usage (1.00%), Info (Available), Class (db.t2.micro), Role (Instance), Current activity (0 Connections), Engine (MySQL), and Region & AZ (us-east-1a). Below the summary, the 'Connectivity' tab is selected, showing the 'Endpoint & port' section with the endpoint 'digitalsummit.cwyafhmsarvs.us-east-1.rds.amazonaws.com' highlighted in a red box. Other sections include Networking (Availability zone: us-east-1a, VPC: vpc-c3ece9bb, Subnet group: default) and Security (VPC security groups: default (sg-4f6e2b3b) (active), Public accessibility: Yes, Certificate authority).

Click on **VPC security groups** as shown below.

The screenshot shows the AWS Management Console for the same Amazon RDS instance 'digitalsummit'. The 'Connectivity' tab is still selected, but the 'Security' section is now highlighted. The 'VPC security groups' section shows 'default (sg-4f6e2b3b) (active)' highlighted in a red box. The 'Endpoint & port' section shows the endpoint 'digitalsummit.cwyafhmsarvs.us-east-1.rds.amazonaws.com' highlighted in a blue box. The 'Networking' section shows the same details as before.

Click on **Inbound** tab and click on **Edit**.

Create Security Group

Actions

search : sg-4f6e2b3b

Add filter

	Name	Group ID	Group Name	VPC ID	Description
	sg-4f6e2b3b	default	vpc-c3ece9bb	default VPC security group	

Security Group: sg-4f6e2b3b

Description

Inbound

Outbound

Tags

Edit

Click on **Add Rule** to open the database port as shown below.

Edit inbound rules

Type	Protocol	Port Range	Source	Description
All TCP	TCP	0 - 65535	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop
All TCP	TCP	0 - 65535	Custom ::/0	e.g. SSH for Admin Desktop
SSH	TCP	22	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop
SSH	TCP	22	Custom ::/0	e.g. SSH for Admin Desktop
Custom TCP	TCP	51678	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop
Custom TCP	TCP	51678	Custom ::/0	e.g. SSH for Admin Desktop

Add Rule

NOTE: Any edits made on existing rules will result in the edited rule being deleted and a new rule created with the new details. This will cause traffic that depends on that rule to be dropped for a very brief period of time until the new rule can be created.

Cancel

Save

Here, we used MySQL DB default port for the DB as shown in above steps i.e., 3306. So we opened 3306 and select source as **Anywhere** and click on **Save**.

Edit inbound rules

Type	Protocol	Port Range	Source	Description
All TCP	TCP	0 - 65535	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop
All TCP	TCP	0 - 65535	Custom ::/0	e.g. SSH for Admin Desktop
SSH	TCP	22	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop
SSH	TCP	22	Custom ::/0	e.g. SSH for Admin Desktop
Custom TCP F	TCP	51678	Custom 0.0.0.0/0	e.g. SSH for Admin Desktop
Custom TCP F	TCP	51678	Custom ::/0	e.g. SSH for Admin Desktop
MYSQL/Auror	TCP	3306	Anywhere 0.0.0.0/0, ::/0	e.g. SSH for Admin Desktop

Add Rule

NOTE: Any edits made on existing rules will result in the edited rule being deleted and a new rule created with the new details. This will cause traffic that depends on that rule to be dropped for a very brief period of time until the new rule can be created.

Cancel
Save

Now, download **Microsoft Visual Studio** and **Microsoft .NET Framework** from GitHub and Install.

## Step #2 | Installing MySQL Workbench on Windows

Open the GitHub URL in the browser, and download the Zip.

Branch: master
New pull request

Create new file
Upload files
Find file
Clone or download

This branch is even with master.

Initial commit

mysql-workbench-community-8.0.13-winx64.msi Initial commit

putty.exe Initial commit

Help people interested in this repository understand your project by adding a README.

Add a README



Clone with HTTPS
Use SSH

Use Git or checkout with SVN using the web URL.

https://github.com/ /Install

Open in Desktop
Download ZIP

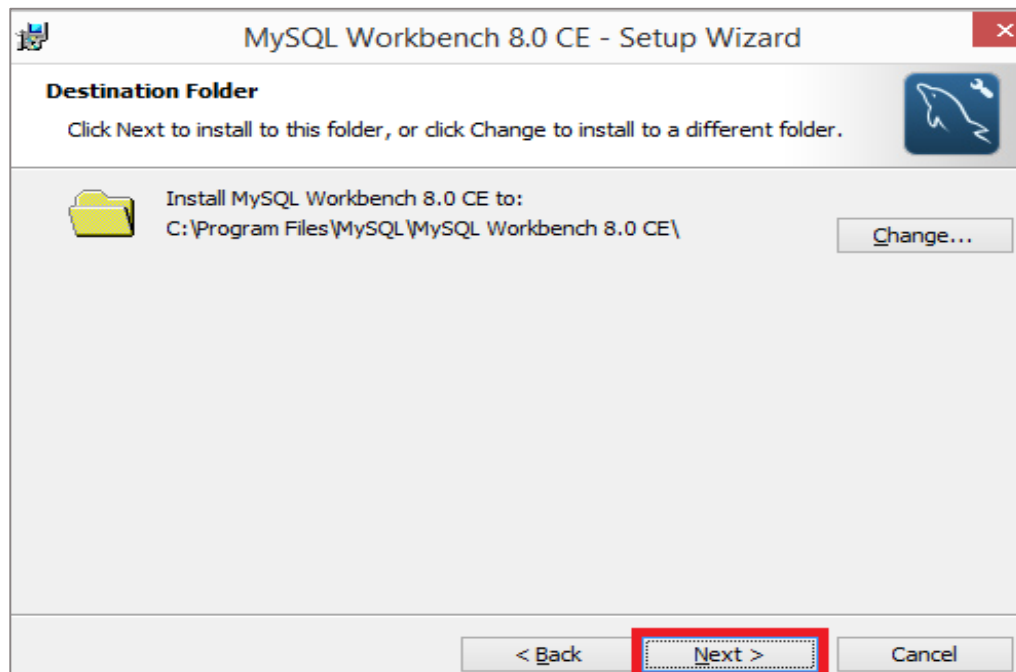
Once the download is done, check the Installer folder, you will be able to see **mysql-workbench windows Installer** in the folder. Double click on **mysql-workbench windows Installer**.

Name	Date modified	Type	Size
 mysql-workbench-community-8.0.13-wi...	12/6/2018 9:28 AM	Windows Installer ...	34,364 KB
 putty.exe	12/6/2018 9:28 AM	Application	835 KB

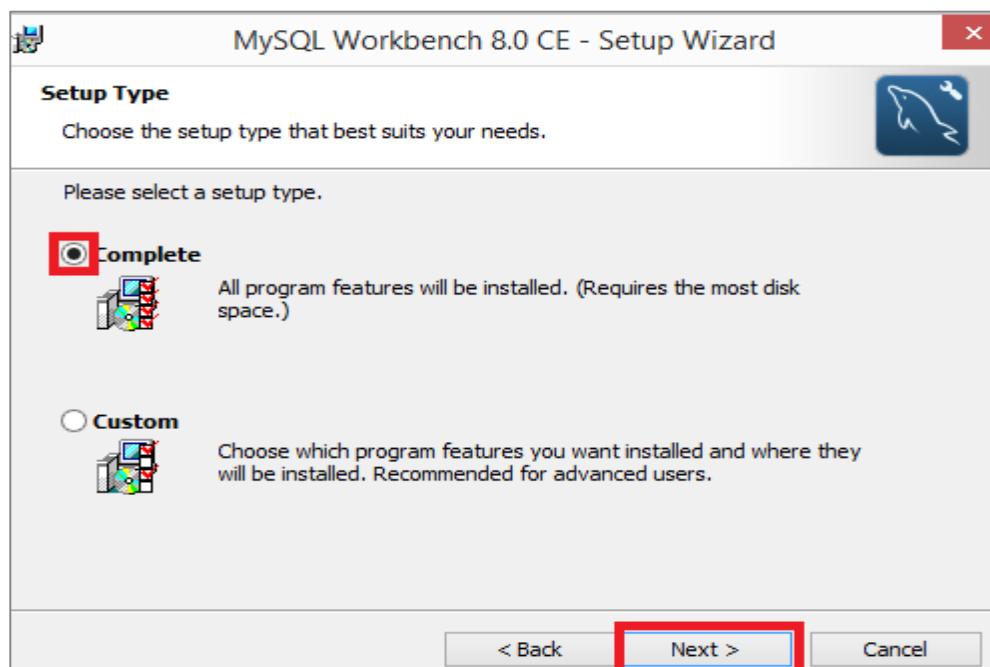
Click on **Next**.



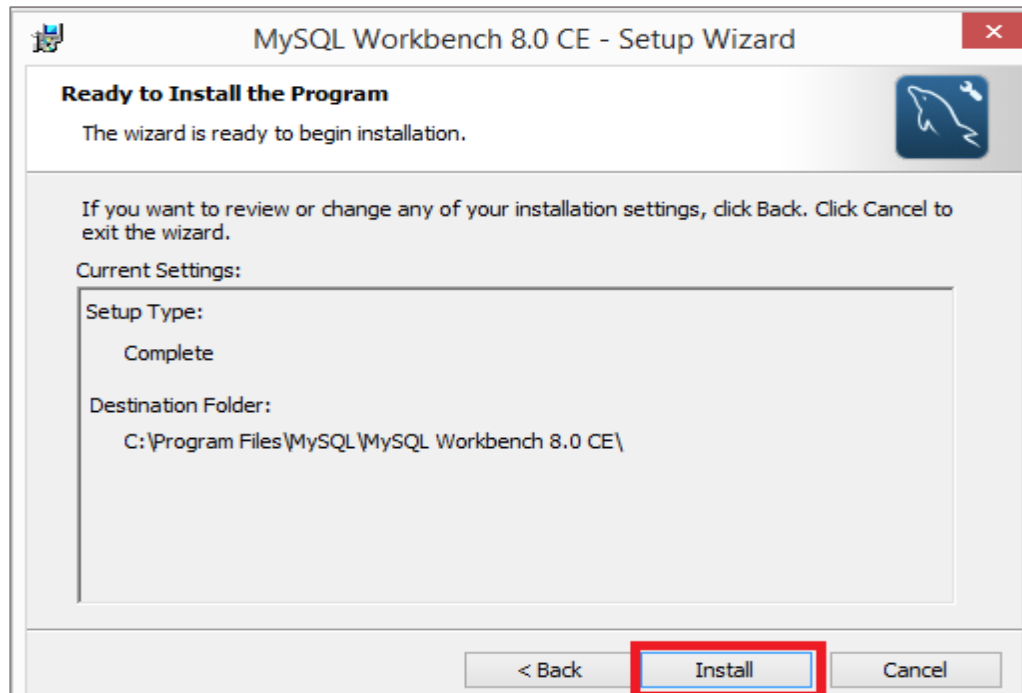
If you want to change the location of the installer, change the path and click on **Next**.



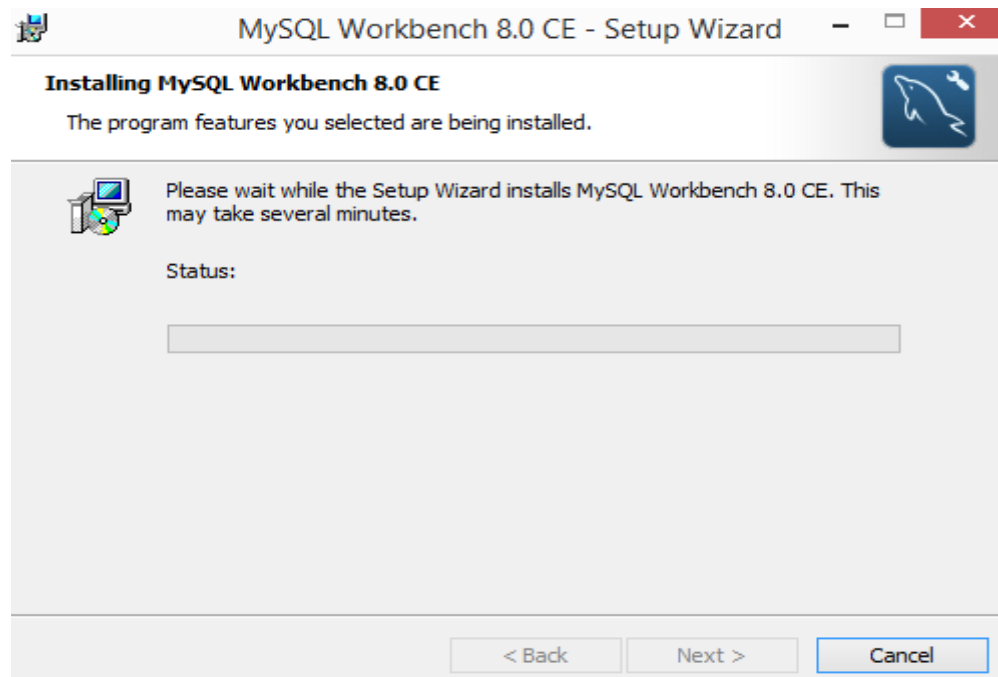
Setup Type will be **Complete** by default as shown, click on **Next**.



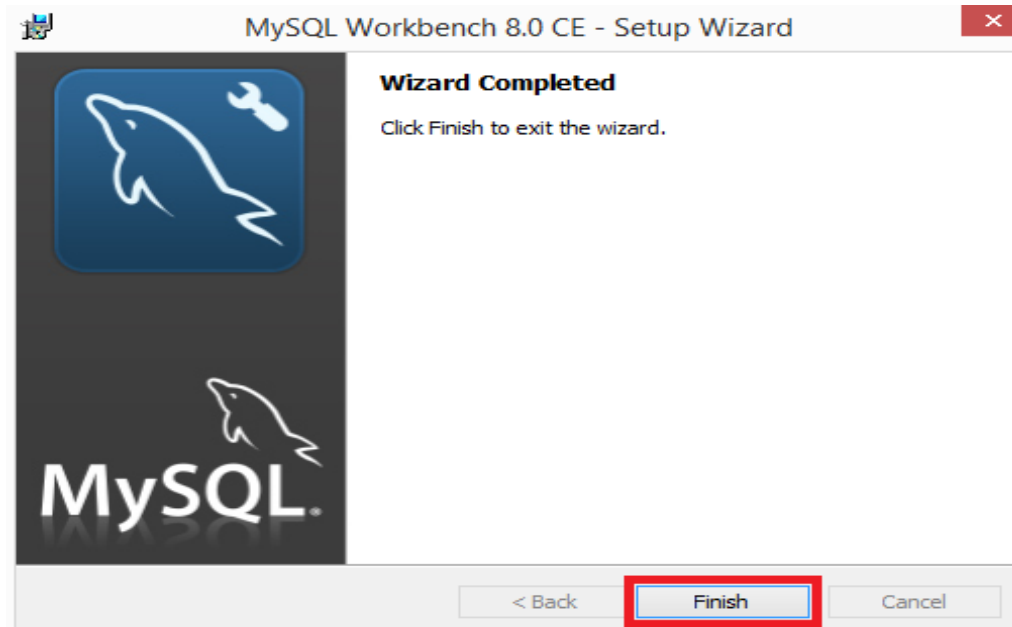
Click on **Install** to have MySQL Workbench on your machines.



Installation process starts as below.

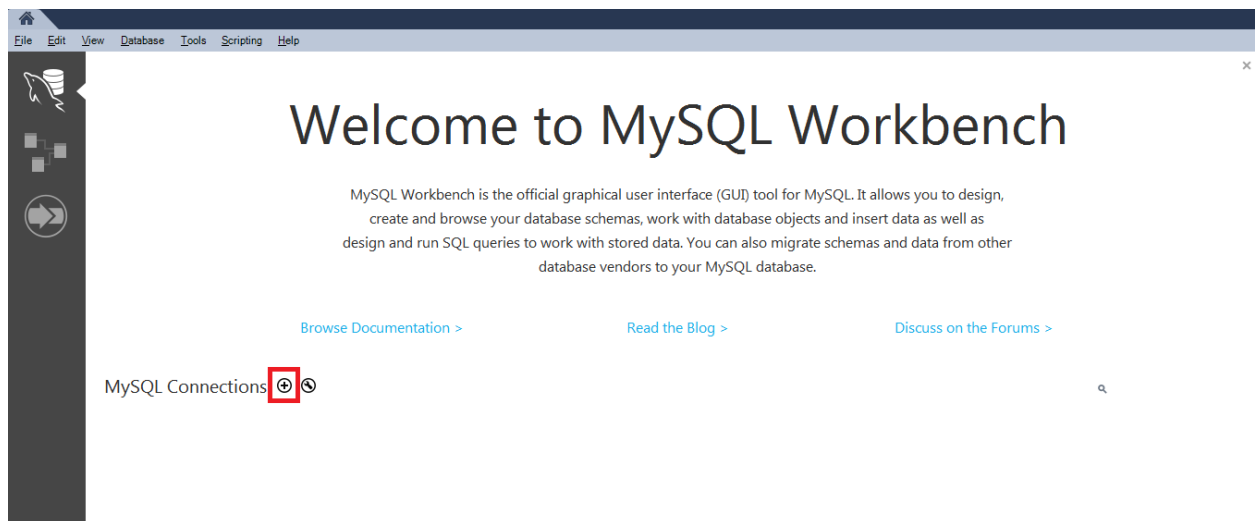


Click on **Finish** to complete the process.



## Step #3 | Connect MySQL DB using MySQL DB Connector

Open MySQL Workbench and click on new connection.



Furnish below details



**Connection Name:** <your-connection-name>

**Hostname :** <your-RDS-DB-endpoint>

**Port :** 3306

**Username :** <your-database-name>

**Default Schema :** <your-database-name>

Setup New Connection

Connection Name:  Type a name for the connection

Connection Method:  Method to use to connect to the RDBMS

Parameters

Hostname:  Port:  Name or IP address of the server host - and TCP/IP port.

Username:  Name of the user to connect with.

Password:   The user's password. Will be requested later if it's not set.

Default Schema:  The schema to use as default schema. Leave blank to select it later.

Click on **Store in Vault** to the save password of database.

Setup New Connection

Connection Name:  Type a name for the connection

Connection Method:  Method to use to connect to the RDBMS

Parameters

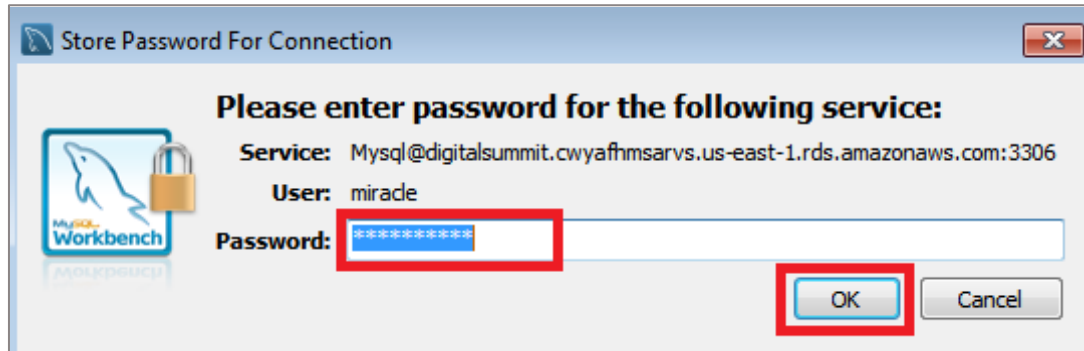
Hostname:  Port:  Name or IP address of the server host - and TCP/IP port.

Username:  Name of the user to connect with.

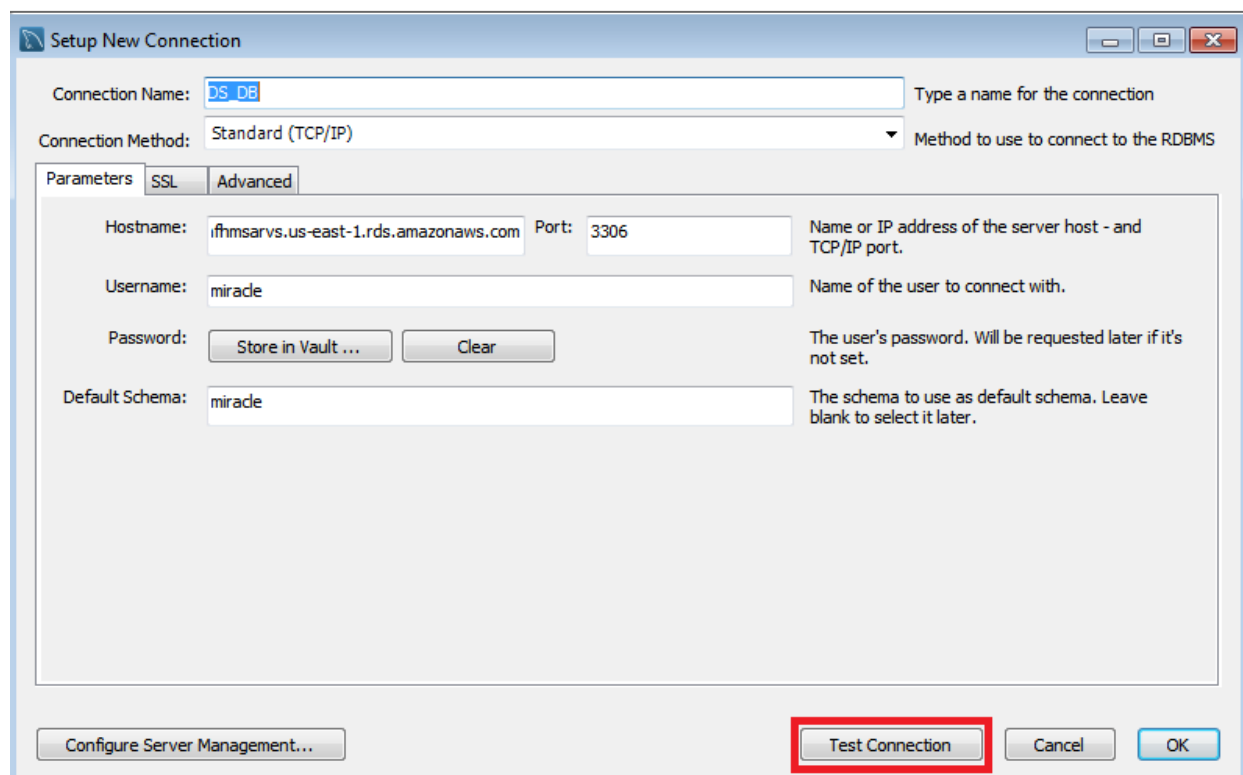
Password:   The user's password. Will be requested later if it's not set.

Default Schema:  The schema to use as default schema. Leave blank to select it later.

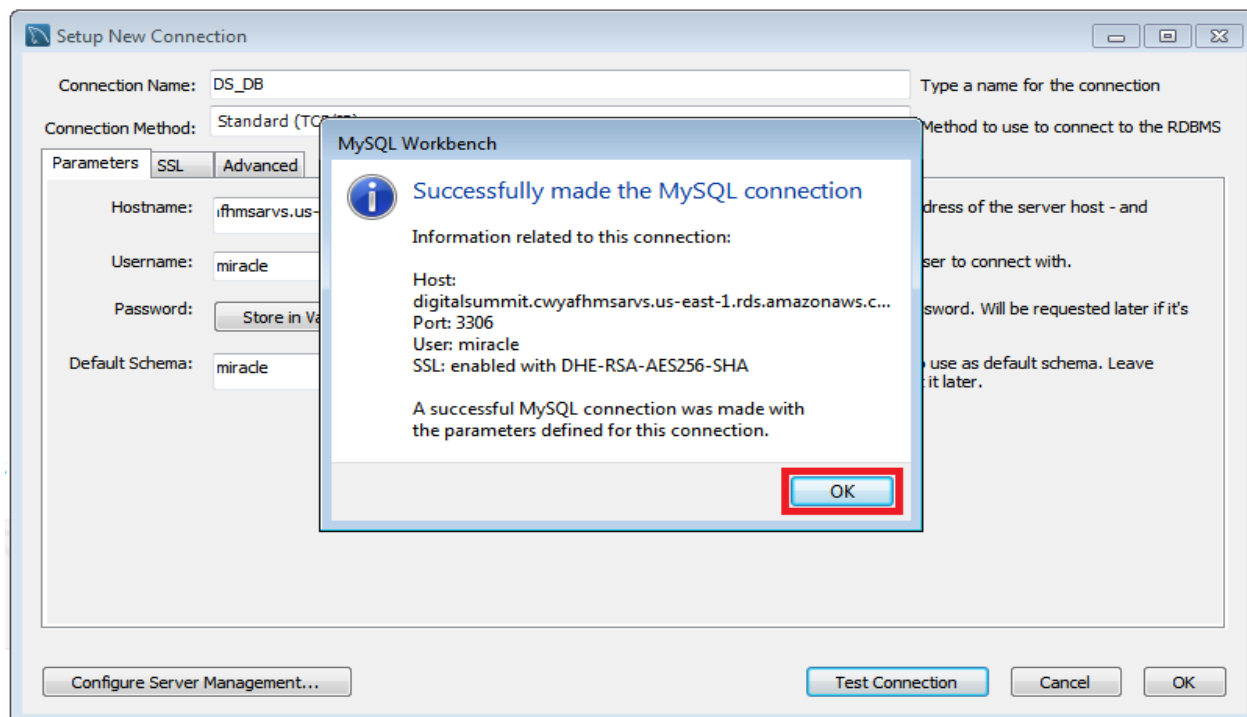
Enter the **Password** of your database and click on **OK**.



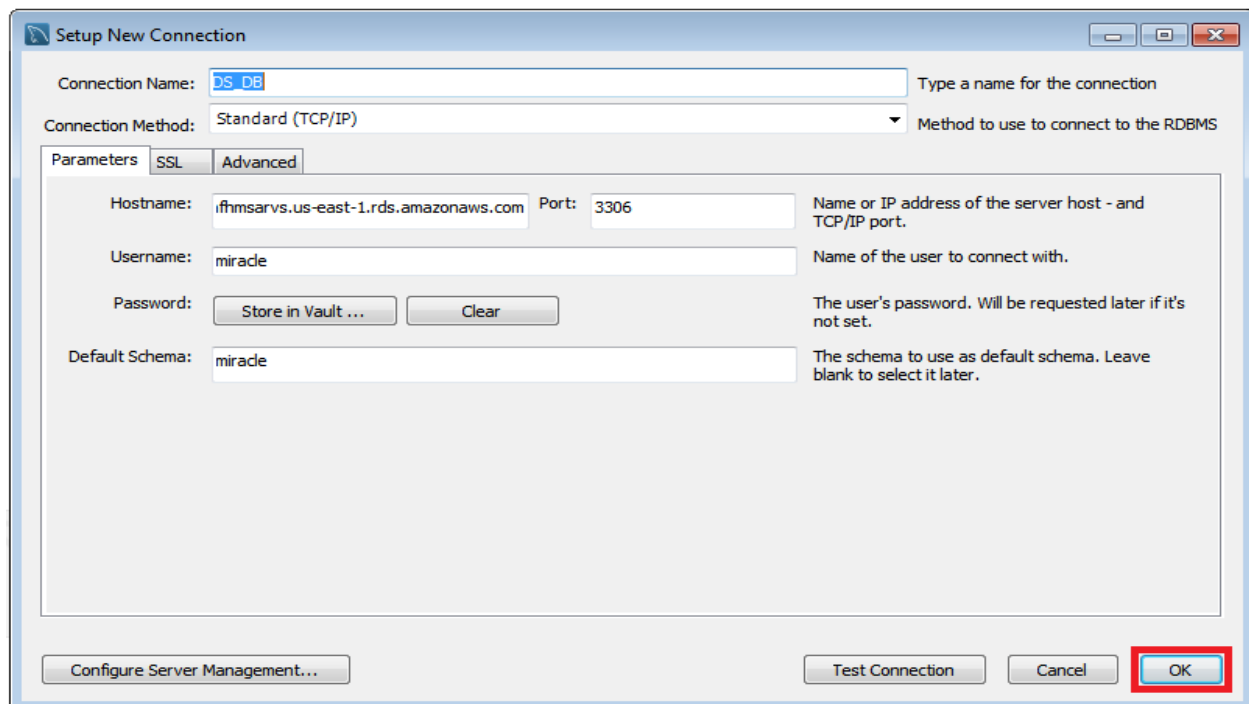
Click on **Test Connection** to check whether connection is established with RDS DB.



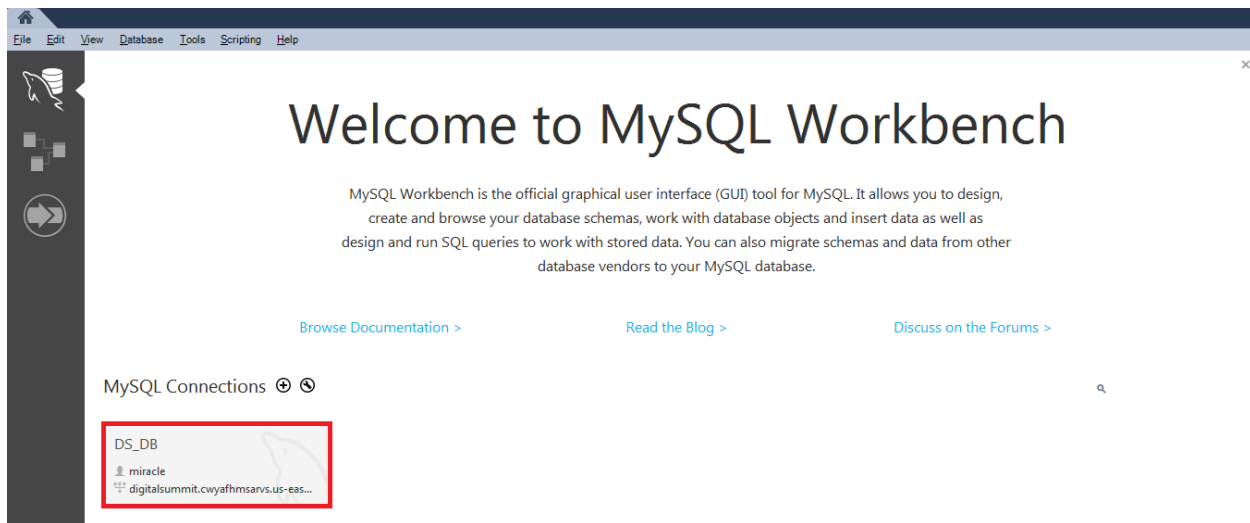
Popup will be displayed once you select the Test Connection as below, click on **OK**.



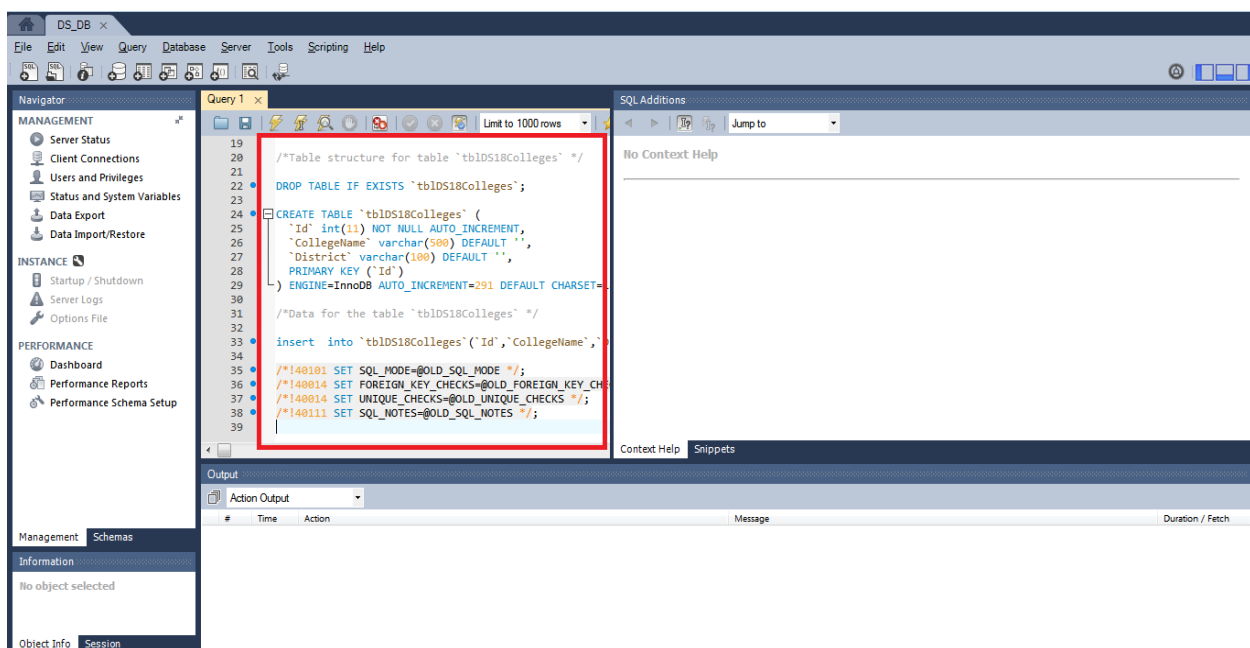
Click on **OK**.



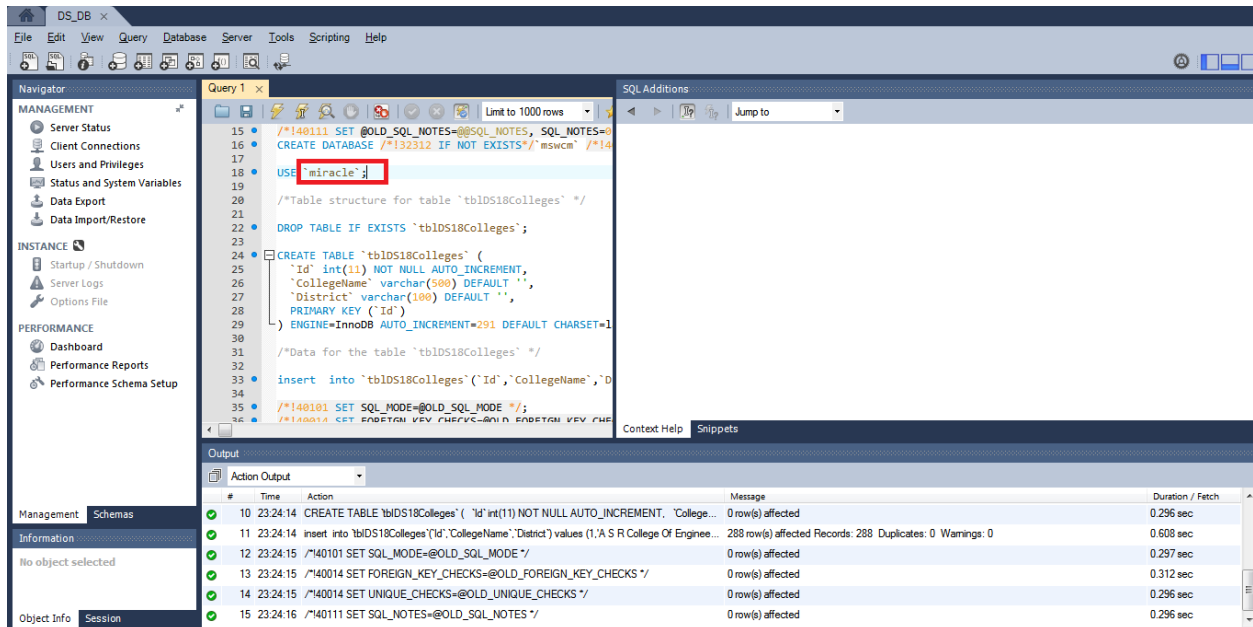
Click on the MySQL connection name you have created in earlier steps.



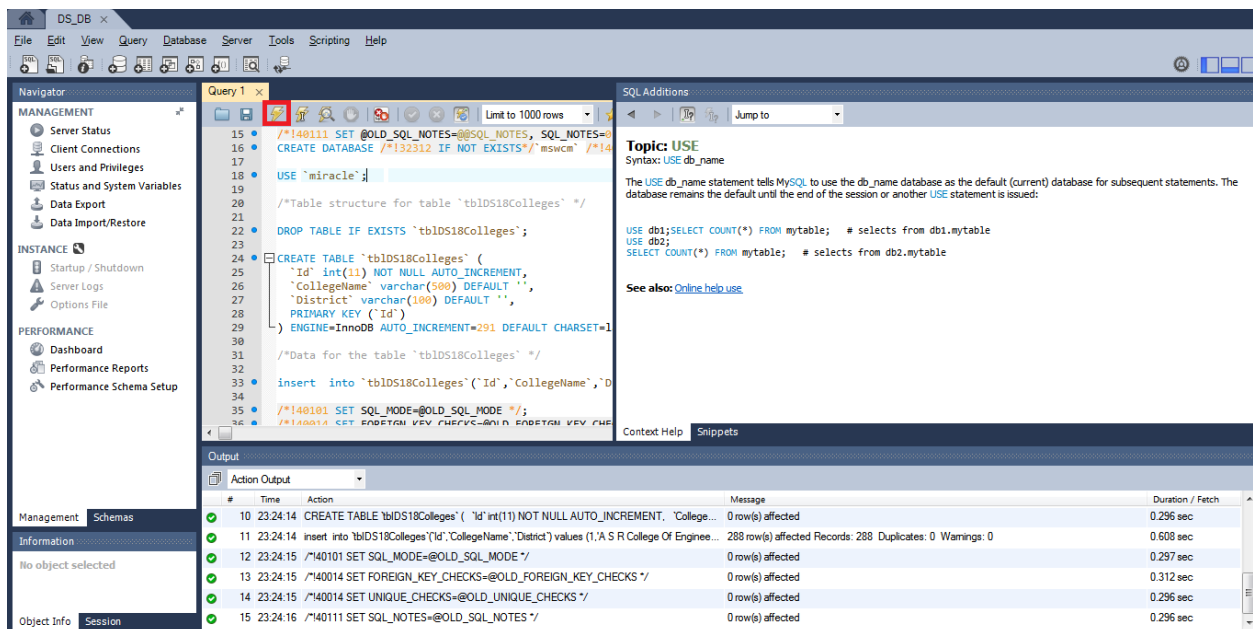
Open the **s&d.sql** file from Git Repo folder (which you downloaded earlier) and paste the code in the left side of the box, which helps to create Table and insert data in your database.



Change the database name with your DB name.



Click on the Run to execute the script.



Now you will get data into your database.

For any questions regarding the lab please feel free to reach out to [innovation@miraclesoft.com](mailto:innovation@miraclesoft.com). We hope you enjoyed this!