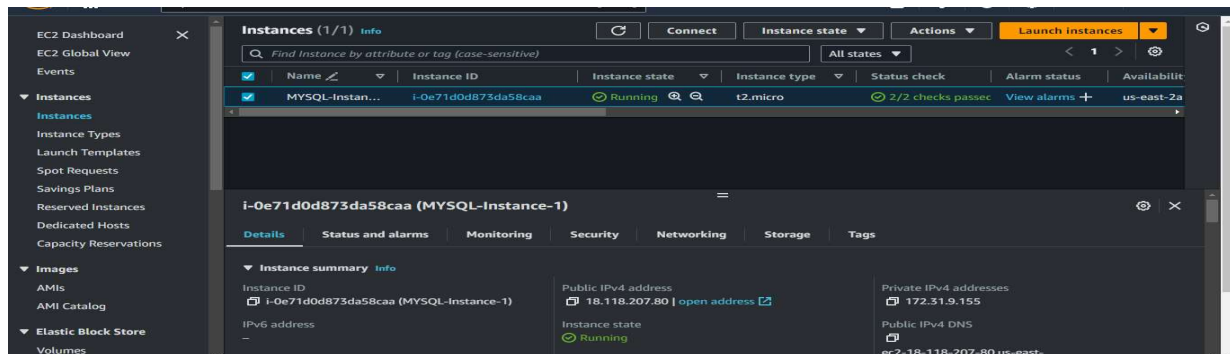
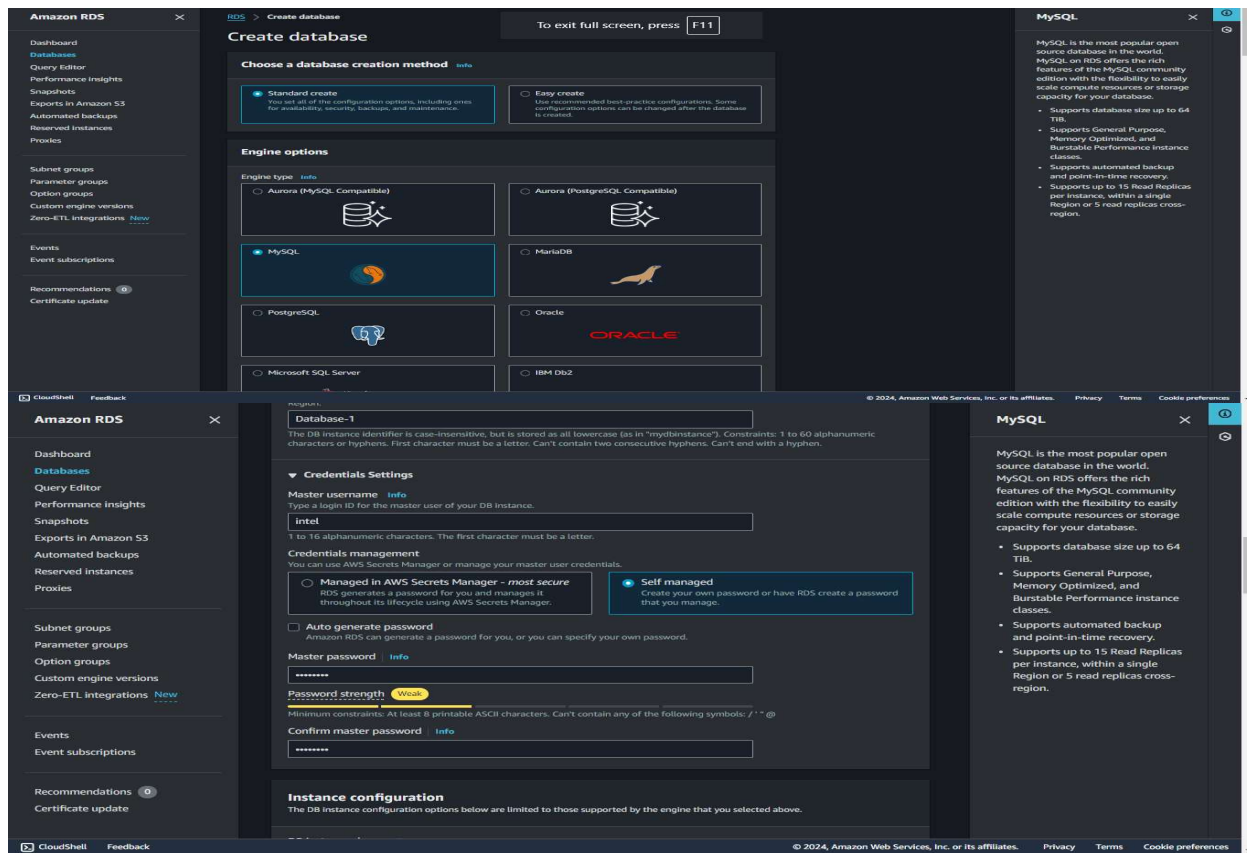


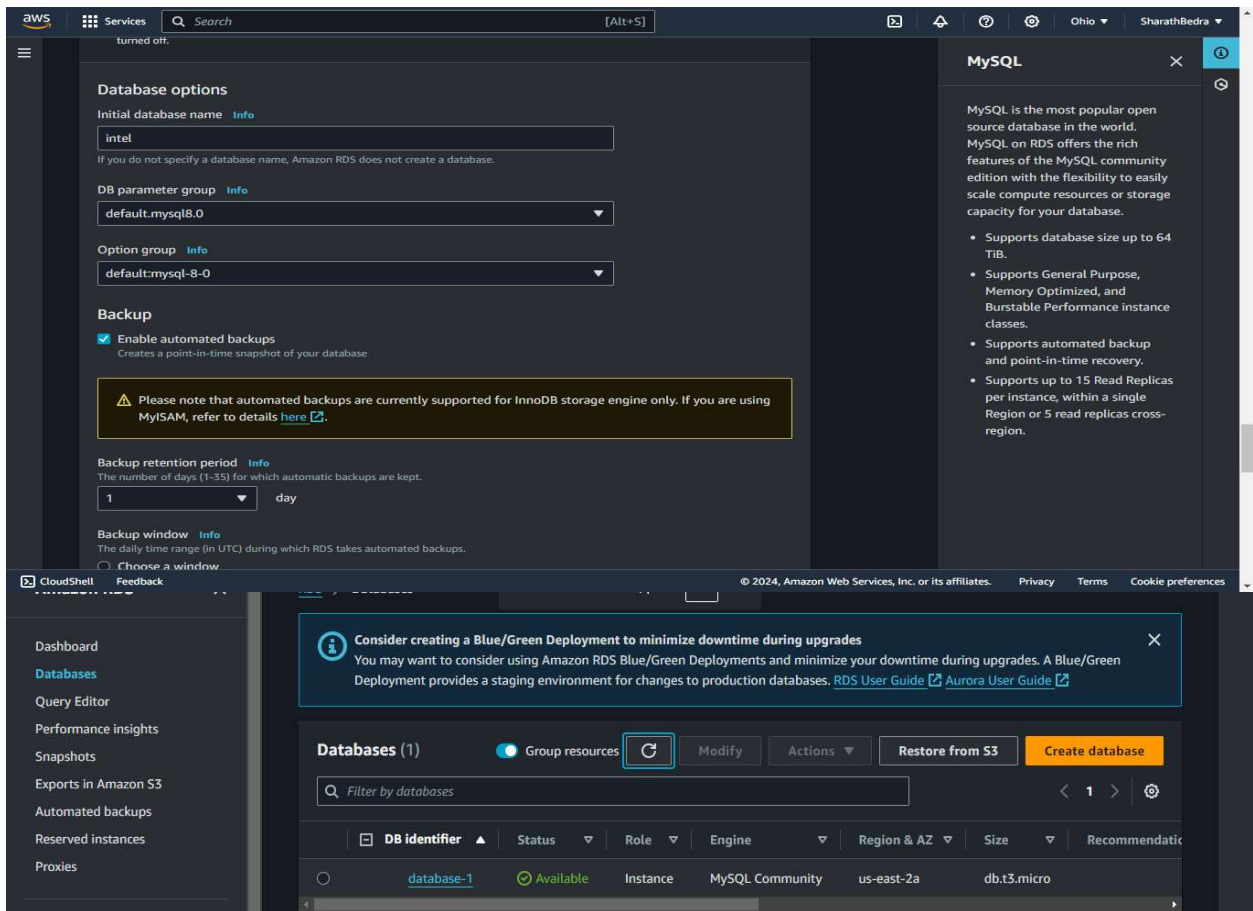
Project 1 – Deploying A Multi-Tier Website Using AWS EC2;

I have Launched an EC2 Instance;



Created My-SQL database;





Let us copy the endpoint of the database and change it in our code;

```
*index - Notepad
File Edit Format View Help
</div>
<div class="form-group">
  <label for="email">Email:</label>
  <input type="text" class="form-control" name="email">
</div>
<button type="submit" class="btn btn-success">Submit</button>
</form></td>
<td colspan="4"></td>
</tr>
</table>
</div>
</div>
<?php
$firstname=$_POST['firstname'];
$email=$_POST['email'];
$servername = "database-1.cj2usy6mca6l.us-east-2.rds.amazonaws.com";
$username = "intel";
$password = "intel123";
$db = "intel";
// Create connection
$conn = new mysqli($servername, $username, $password, $db);

// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}
if(isset($_POST['firstname']) && isset($_POST['email'])) {
    $sql = "INSERT INTO data (firstname,email)
VALUES ('".$_firstname."', '".$_email."')";

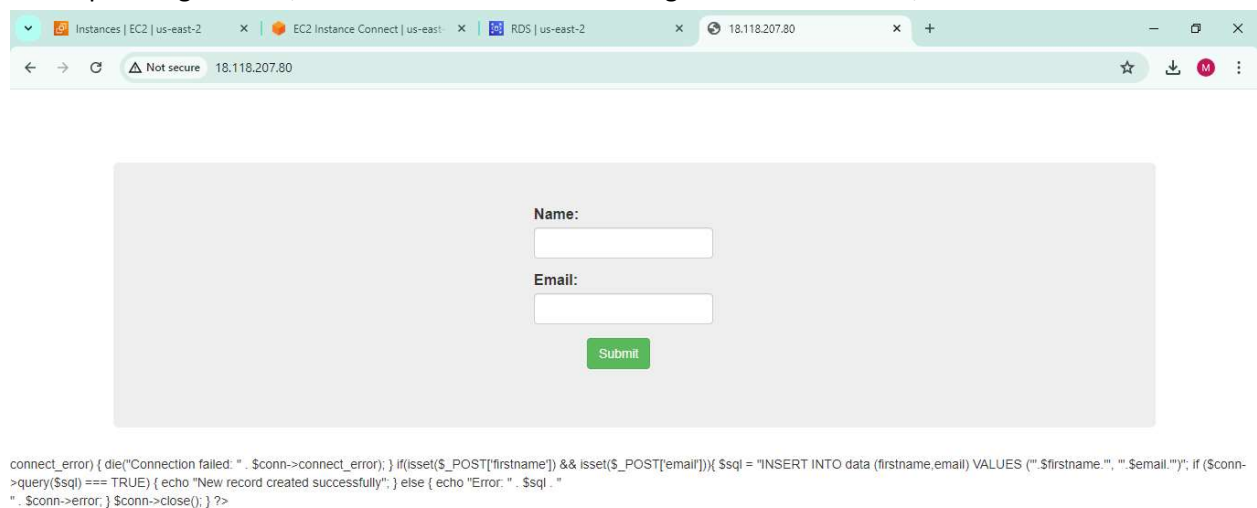
    if ($conn->query($sql) === TRUE) {
        echo "New record created successfully";
    } else {
        echo "Error: " . $sql . "<br>" . $conn->error;
    }
}
```

Now we shall create index.php file inside our instance upload our new code inside that file;

```
ubuntu@ip-10-0-1-93:/var/www/html$ ls
ubuntu@ip-10-0-1-93:/var/www/html$ sudo nano index.php
ubuntu@ip-10-0-1-93:/var/www/html$ ls
ubuntu@ip-10-0-1-93:/var/www/html$ sudo nano index.php

</div>
<button type="submit" class="btn btn-success">Submit</button>
</form></td>
<td colspan="4"></td>
</tr>
</table>
</div>
</div>
<?php
$firstname=$ _POST['firstname'];
$email=$ _POST['email'];
$servername = "database-1.cj2usy6mca6l.us-east-2.rds.amazonaws.com";
$username = "intel";
$password = "intel123";
$db = "intel";
// Create connection
$conn = new mysqli($servername, $username, $password, $db);
// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}
if(isset($_POST['firstname']) && isset($_POST['email'])) { $sql = "INSERT INTO data (firstname,email) VALUES ('".$_POST['firstname']."','".$_POST['email']."')"; if ($conn->query($sql) === TRUE) { echo "New record created successfully"; } else { echo "Error: " . $sql . " ". $conn->error; } $conn->close(); } ?>
```

After uploading that file, if we browse our Public-IP we get with some errors;



Now we shall install mysql-server;

```
ubuntu@ip-172-31-9-155:/var/www/html$ ls
index.php
ubuntu@ip-172-31-9-155:/var/www/html$ sudo nano index.php
ubuntu@ip-172-31-9-155:/var/www/html$ sudo apt-get install mysql-server -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libbgi-fast-perl libbgi-pm-perl libclone-perl libencode-locale-perl libevent-pthreads-2.1-7t64 libfcgi-bin libfcgi-perl libfcgi0t64
  libhtml-parser-perl libhtml-tagset-perl libhtml-template-perl libhttp-date-perl libhttp-message-perl libio-html-perl liblwp-mediatypes-perl
  libmecab2 libprotobuf-lite32t64 libtimedate-perl liburi-perl mecab-ipadic mecab-ipadic-utf8 mecab-utils mysql-client-8.0
  mysql-client-core-8.0 mysql-common mysql-server mysql-server-8.0 mysql-server-core-8.0
Suggested packages:
  libdata-dump-perl libipc-sharedcache-perl libio-compress-brotli-perl libbusiness-isbn-perl libregexp-ipv6-perl libwww-perl mailx tinycal
The following NEW packages will be installed:
  libbgi-fast-perl libbgi-pm-perl libclone-perl libencode-locale-perl libevent-pthreads-2.1-7t64 libfcgi-bin libfcgi-perl libfcgi0t64
  libhtml-parser-perl libhtml-tagset-perl libhtml-template-perl libhttp-date-perl libhttp-message-perl libio-html-perl liblwp-mediatypes-perl
  libmecab2 libprotobuf-lite32t64 libtimedate-perl liburi-perl mecab-ipadic mecab-ipadic-utf8 mecab-utils mysql-client-8.0
  mysql-client-core-8.0 mysql-common mysql-server mysql-server-8.0 mysql-server-core-8.0
0 upgraded, 28 newly installed, 0 to remove and 22 not upgraded.
Need to get 29.6 MB of archives.
After this operation, 242 MB of additional disk space will be used.
Get:1 http://us-east-2.ec2.archive.ubuntu.com/ubuntu noble/main amd64 mysql-common all 5.8+1.1.0build1 [6746 B]
Get:2 http://us-east-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 mysql-client-core-8.0 amd64 8.0.37-0ubuntu0.24.04.1 [2794 kB]
Get:3 http://us-east-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 mysql-client-8.0 amd64 8.0.37-0ubuntu0.24.04.1 [22.4 kB]
Get:4 http://us-east-2.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libevent-pthreads-2.1-7t64 amd64 2.1.12-stable-9ubuntu2 [7982 B]
Get:5 http://us-east-2.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libmecab2 amd64 0.996-14ubuntu4 [201 kB]
Get:6 http://us-east-2.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libprotobuf-lite32t64 amd64 3.21.12-8.2build1 [238 kB]
Get:7 http://us-east-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 mysql-server-core-8.0 amd64 8.0.37-0ubuntu0.24.04.1 [17.5 MB]
Get:8 http://us-east-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 mysql-server-8.0 amd64 8.0.37-0ubuntu0.24.04.1 [1428 kB]
Get:9 http://us-east-2.ec2.archive.ubuntu.com/ubuntu noble/main amd64 libhtml-tagset-perl all 3.20-6 [11.3 kB]
```

Now we shall connect to our RDS;

```
ubuntu@ip-172-31-9-155:/var/www/html$ sudo mysql -h database-1.cj2usy6mca6l.us-east-2.rds.amazonaws.com -u intel -pintel123
mysql: [Warning] Using a password on the command line interface can be insecure.
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 31
Server version: 8.0.35 Source distribution

Copyright (c) 2000, 2024, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

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

mysql>
```

Created a Table named data;

```
aws Services Search [Alt+S] Ohio SharathBedra

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affiliates. Other names may be trademarks of their respective
owners.

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

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| intel      |
| mysql      |
| performance_schema |
| sys       |
+-----+
5 rows in set (0.00 sec)

mysql> use intel
Database changed
mysql> create table data (firstname varchar(20),email varchar(20));
Query OK, 0 rows affected (0.02 sec)

mysql> select * from data;
Empty set (0.01 sec)

mysql> insert into data values('IPL','iplt20@gmail.com');
Query OK, 1 row affected (0.01 sec)

mysql> select * from data;
+-----+-----+
| firstname | email |
+-----+-----+
| IPL       | iplt20@gmail.com |
+-----+-----+
1 row in set (0.00 sec)

mysql>
```

Now connecting to same instance with new tab and shall host php.file;

```
aws Services Search [Alt+S] Ohio SharathBedra

ubuntu@ip-172-31-9-155:~$ sudo add-apt-repository -y ppa:ondrej/php
PPA publishes dbgsym, you may need to include 'main/debug' component
Repository: 'Types: deb
URIs: https://ppa.launchpadcontent.net/ondrej/php/ubuntu/
Suites: noble
Components: main
'
Description:
Co-installable PHP versions: PHP 5.6, PHP 7.x, PHP 8.x and most requested extensions are included. Only Supported Ubuntu Releases (https://wiki.ubuntu.com/Releases) are provided.

Debian oldstable and stable packages are provided as well: https://deb.sury.org/#debian-dpa

You can get more information about the packages at https://deb.sury.org

BUGS&FEATURES: This PPA now has a issue tracker:
https://deb.sury.org/#bug-reporting

CAVEATS:
1. If you are using php-gearman, you need to add ppa:ondrej/pkg-gearman
2. If you are using apache2, you are advised to add ppa:ondrej/apache2
3. If you are using nginx, you are advised to add ppa:ondrej/nginx-mainline
   or ppa:ondrej/nginx

PLEASE READ: If you like my work and want to give me a little motivation, please consider donating regularly: https://donate.sury.org/

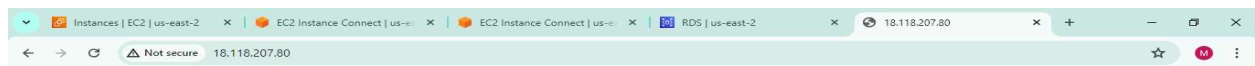
WARNING: add-apt-repository is broken with non-UTF-8 locales, see
https://github.com/oerdnj/deb.sury.org/issues/56 for workaround:

$ LC_ALL=C.UTF-8 add-apt-repository ppa:ondrej/php
More info: https://launchpad.net/~ondrej/+archive/ubuntu/php
```

Now we shall establish a connection between our source code and database by installing the dependencies;

```
aws Services Search [Alt+S]
ubuntu@ip-172-31-9-155:~$ sudo apt-get install php5.6 mysql-client php5.6-mysqli -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Note, selecting 'php5.6-mysql' instead of 'php5.6-mysqli'
The following additional packages will be installed:
  debsumorg-archive-keyring libapache2-mod-php5.6 libpcre3 php-common php5.6-cli php5.6-common php5.6-json php5.6-opcache php5.6-readline
Suggested packages:
  php-pear
The following NEW packages will be installed:
  debsumorg-archive-keyring libapache2-mod-php5.6 libpcre3 mysql-client php-common php5.6 php5.6-cli php5.6-common php5.6-json php5.6-mysql
  php5.6-opcache php5.6-readline
0 upgraded, 12 newly installed, 0 to remove and 25 not upgraded.
Need to get 4127 kB of archives.
After this operation, 15.1 MB of additional disk space will be used.
Get:1 http://us-east-2.ec2.archive.ubuntu.com/ubuntu noble/universe amd64 libpcre3 amd64 2:8.39-15build1 [248 kB]
Get:2 http://us-east-2.ec2.archive.ubuntu.com/ubuntu noble-updates/main amd64 mysql-client all 8.0.37-0ubuntu0.24.04.1 [9414 B]
Get:3 https://ppa.launchpadcontent.net/ondrej/php/ubuntu noble/main amd64 debsumorg-archive-keyring all 2024.02.05+ubuntu24.04.1+deb.sury.org+1
[4332 B]
Get:4 https://ppa.launchpadcontent.net/ondrej/php/ubuntu noble/main amd64 php-common all 2:94+ubuntu24.04.1+deb.sury.org+1 [13.0 kB]
Get:5 https://ppa.launchpadcontent.net/ondrej/php/ubuntu noble/main amd64 php5.6-common amd64 5.6.40-77+ubuntu24.04.1+deb.sury.org+1 [686 kB]
Get:6 https://ppa.launchpadcontent.net/ondrej/php/ubuntu noble/main amd64 php5.6-json amd64 5.6.40-77+ubuntu24.04.1+deb.sury.org+1 [19.0 kB]
Get:7 https://ppa.launchpadcontent.net/ondrej/php/ubuntu noble/main amd64 php5.6-opcache amd64 5.6.40-77+ubuntu24.04.1+deb.sury.org+1 [68.0 kB]
Get:8 https://ppa.launchpadcontent.net/ondrej/php/ubuntu noble/main amd64 php5.6-readline amd64 5.6.40-77+ubuntu24.04.1+deb.sury.org+1 [13.9 kB]
Get:9 https://ppa.launchpadcontent.net/ondrej/php/ubuntu noble/main amd64 php5.6-cli amd64 5.6.40-77+ubuntu24.04.1+deb.sury.org+1 [1386 kB]
Get:10 https://ppa.launchpadcontent.net/ondrej/php/ubuntu noble/main amd64 libapache2-mod-php5.6 amd64 5.6.40-77+ubuntu24.04.1+deb.sury.org+1 [13
34 kB]
Get:11 https://ppa.launchpadcontent.net/ondrej/php/ubuntu noble/main amd64 php5.6 all 5.6.40-77+ubuntu24.04.1+deb.sury.org+1 [191 kB]
Get:12 https://ppa.launchpadcontent.net/ondrej/php/ubuntu noble/main amd64 php5.6-mysql amd64 5.6.40-77+ubuntu24.04.1+deb.sury.org+1 [154 kB]
Fetched 4127 kB in 6s (687 kB/s)
Selecting previously unselected package debsumorg-archive-keyring.
(Reading database ... 69078 files and directories currently installed.)
Preparing to unpack .../00-debsumorg-archive-keyring_2024.02.05+ubuntu24.04.1+deb.sury.org+1_all.deb ...
Unpacking debsumorg-archive-keyring (2024.02.05+ubuntu24.04.1+deb.sury.org+1) ...
Selecting previously unselected package libpcre3:amd64.
Preparing to unpack .../01-libpcre3_2:8.39-15build1_amd64.deb ...
Unpacking libpcre3:amd64 (2:8.39-15build1) ...
Selecting previously unselected package php-common.
Preparing to unpack .../02-php-common_2:94+ubuntu24.04.1+deb.sury.org+1_all.deb ...
```

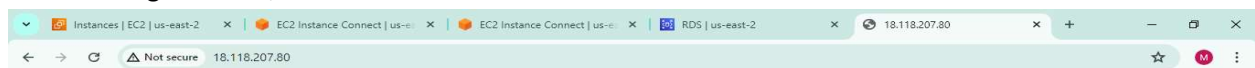
Now we didn't get any error;



Name:

Email:

Now a data got stored;



Name:

Email:

New record created successfully


```
us-east-2.console.aws.amazon.com/ec2-instance-connect/ssh?connType=standard&instanceId=i-0e71d0d873da58caa&osUser=ubuntu&region=us-east-2&sshPort=22#/  
AWS Services Search [Alt+S]  
5 rows in set (0.00 sec)  
mysql> use intel  
Database changed  
mysql> create table data (firstname varchar(20),email varchar(20));  
Query OK, 0 rows affected (0.02 sec)  
mysql> select * from data;  
Empty set (0.01 sec)  
mysql> insert into data values('IPL','iplt20@gmail.com');  
Query OK, 1 row affected (0.01 sec)  
mysql> select * from data;  
+-----+-----+  
| firstname | email |  
+-----+-----+  
| IPL       | iplt20@gmail.com |  
+-----+-----+  
1 row in set (0.00 sec)  
mysql> select * from data;  
+-----+-----+  
| firstname | email |  
+-----+-----+  
| IPL       | iplt20@gmail.com |  
| Sharath   | sharath20@gmail.com |  
+-----+-----+  
2 rows in set (0.01 sec)  
mysql>
```

Now we shall create an image of the running instance and then using that image we shall create a launch template;

EC2 Dashboard

EC2 Global View

Events

Instances

Instances

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts

Capacity Reservations

Images

AMIs

AMI Catalog

Elastic Block Store

Volumes

Amazon Machine Images (AMIs) (1)

Recycle Bin

EC2 Image Builder

Actions

Launch instance from AMI

Owned by me

Find AMI by attribute or tag

	Name	AMI name	AMI ID	Source	Owner
<input type="checkbox"/>	MyImage-1		ami-00e58493645d5355b	730335234967/MyImage-1	730335234

Select an AMI

EC2 Dashboard

EC2 Global View

Events

Instances

Instances

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts

Capacity Reservations

Images

AMIs

AMI Catalog

Elastic Block Store

Volumes

Launch Templates (1/1)

Actions

Create launch template

Search

	Launch Template ID	Launch Template Name	Default Version	Latest Version	Create Time
<input checked="" type="checkbox"/>	lt-004eb9f61a1b621f8	Template-1	1	1	2024-07-23T17:17:04.000

Template-1 (lt-004eb9f61a1b621f8)

Launch template details

Actions

Delete template

Launch template ID
lt-004eb9f61a1b621f8

Launch template name
Template-1

Default version
1

Owner
arn:aws:iam::730335234967:root

Details

Versions

Template tags

Creating an Auto-Scaling Group;

The screenshot shows the AWS Management Console interface for creating an Auto Scaling group. The main heading is "Configure group size and scaling - optional". Below this, there are several sections for configuration:

- Group size:** Set the initial size of the Auto Scaling group. The desired capacity type is set to "Units (number of instances)". The desired capacity is set to 2.
- Scaling limits:** Set limits on how much your desired capacity can be increased or decreased. The min desired capacity is 1, and the max desired capacity is 3.
- Automatic scaling - optional:** This section is currently collapsed.
- Instance maintenance policy:** Replacement behavior is set to "No policy". Min healthy percentage is 0, and Max healthy percentage is 0.
- Instance scale-in protection:** Instance scale-in protection is disabled.
- Step 5: Add notifications:** No notifications are currently added.
- Step 6: Add tags:** No tags are currently added.

At the bottom, there are buttons for "Cancel", "Previous", and "Create Auto Scaling group".

So, new instances got launched;

The screenshot shows the AWS Management Console interface for the "Instances" page. The table below lists the instances that have been launched:

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public I
	i-0a5d34fe1b9683aef	Running	t2.micro	2/2 checks passed	View alarms	us-east-2b	ec2-18-
	i-0083bddf093d50e8	Running	t2.micro	Initializing	View alarms	us-east-2c	ec2-13-
MySQL-Instan...	i-0e71d0d873da58caa	Running	t2.micro	2/2 checks passed	View alarms	us-east-2a	ec2-18-

Below the table, the details for the instance "i-0e71d0d873da58caa (MySQL-Instance-1)" are shown:

- Instance summary:** Instance ID: i-0e71d0d873da58caa (MySQL-Instance-1), IP name: ip-172-31-9-155.us-east-2.compute.internal, Hostname type: t2.micro.
- Public IPv4 address:** 18.118.207.80 | open address
- Private IPv4 address:** 172.31.9.155
- Public IPv4 DNS:** ec2-18-118-207-80-us-east-2.compute.amazonaws.com | open address
- Private IP DNS name (IPv4 only):** ip-172-31-9-155.us-east-2.compute.internal
- Elastic IP addresses:** -