Cloud Computing– Assignment 2

Title: Launch EC2 instance and deploy a website page on it.

Objective: To understand and implement EC2 service provided by AWS.

**Problem statement:** Write a program for web feed using PHP and HTML on Amazon EC2 instance.

Software Requirements: AWS account, Cygwin, MySQL, PHP, SSH.

Hardware Requirements: Laptop/Desktop.

Theory:

EC2 is short for Elastic Compute Cloud. It is a service which provides us with a virtual server called an instance. With an Amazon EC2, you can set up and configure the OS and install applications on this instance.

The architecture of launching an Amazon EC2 instance looks something like this:
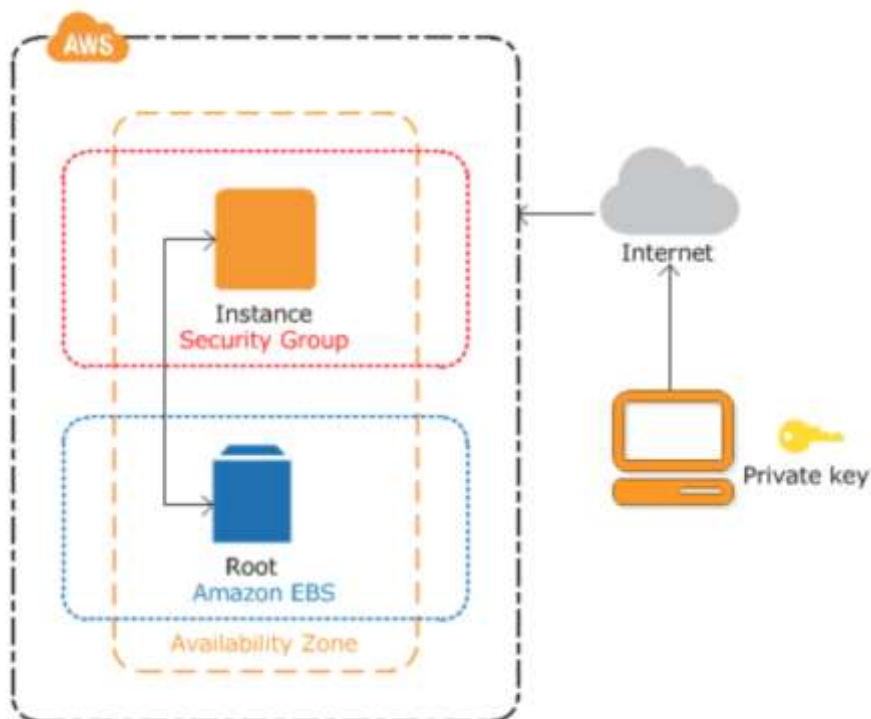
The Instance is an Amazon EBS-backed instance, i.e., root is an EBS volume. Amazon EBS (Elastic Block Storage) provides persistent block storage volumes for use to the instance. Amazon EBS provides the following:

- protects your instance from component failure

- offers high availability and durability

- offers consistent and low-latency performance

- scale your usage up or down within minutes

You can either specify the Availability Zone for your instance (where it should run), or AWS does that automatically for you.

To launch your instance, you need to secure it by specify a key pair and a security group.

A key pair consists of a private key and a public key. The public key will be uploaded to the AWS and inserted into the virtual server. You are suppose to keep the private key; it acts like a password but is much more secure. When you want to connect to an instance, you need to verify your identity. This is done by authentication using the private key.

Security groups are a fundamental service of AWS to control network traffic like a firewall. When an instance is launched, one or more security groups is associated with it.

Program Code:

Example of the key used:

-----BEGIN RSA PRIVATE KEY-----

MIIEpAIBAAKCAQEAurvu3lXWMWwTpmM0EeOqMUUQBp2Yd6PtvgOa
FsmcQrFwUxuJqhGNmAS50pKH

7r2u1SpD7FMb5p9Gp5L2cdB/W7/6DrbwVbxhGIrRWhAIf0k92V45iiyRd7ni
KqppLsoVL9pw41d/

tDzyn5xiguH0Tv41ce6ZQTkDrw3jJBle2AtseaQDborq+FCnqcboQR7VIQYCF
x+IRS+njYoDqBMb

Z0E8RKqR7bAplqHEBtVVYRlmvBlTkN3KCIwuD5SpqptVQvTQBzl2FG5M
8r3UDT/lht8gpysSAyxa

PgNc1crwu7QKhSx/p/g9znzEstoGw5JIk10dPX6xWKrN90hiGTw4VQIDAQA
BAoIBADO0CYWiOrZg

eGhfm3FAmkUeHDvYsvideRxdnvKkTBHjU3iPbWSbi5sF4/W8AMtH1frLwx
bSRC1s+IE5necRldHv

q+sbGByFFlVXSnQncFLeErP29POfN3/xBgBOQuVjqs4fK5anCYL8RSmQg
W4/5gdhN6ceK2z1vmFf

9P5vz+T9e2HgulVpRC4U3P3lP5MM1aIf1eTVXTT1Am5d+utmLl2xDUQyM
idcGTo4NT7OONOgsrbF

2lovsKQRPzpfm8GGxEEqyGC3WMsgEVWFg6Vm/UkE/1gUz52MmFDO8D
sdINIYbog6KJfxEOYsBuOM

MCv422XXT8hRRPGDc9hFNS3DNcECgYEA6nvRYEiAZ9ClCisDvNqIItxI
MO/7i90hqYVc2H6IqPvd

4Hqk4yqPM6X6egj37cKnHi307Vs6YaKiqUH3eiLw57PVYCeTOzdl8Cyiuxh
AR1cKZ0SeaVLKYenm

0RApJAgPFZa7vdNkYvuSXERMUUquHA+CTq59ppGpKqZqnfGl+A0CgYE
Ay95yDWgSOI/piIUxMIgh

l5AkGSZN+F36iD2cZ41okDeJPRKvVonRwFNxtxZHYz9lEt5SqC1QagKCoG
AKhOwpitHPT6iTjuH8

iJkz8F691nLWx11bCDGUMhgivR7NZMQ3q0BP9YUZW+vCsZKZDjU+eP9
ml5mR8Iac45+EN719p2kC

gYEAk6mrnd2qdzYOaMvTy7820fU0xRSrrVVxWGbypCdy+i+6dx3k7mWjzp
usk+NH9oOJaFj6j+rO

ZiPcGYjARzrvyIoYSjhB4J2vZUNGq1nHSOXIWGX++Ea5ylVZFLj/n4Avt6G
30v/njOnuLoqYIO1N

ncAqiFAcMqQyCvjH1XUS1pUCgYBDzUNZOhd1QEeG4+UsItopMgMPajHc
PEUqMnNl7R2teQrniONP

gJ6FvDrBjWNImrjewZnz3L41w4f2FnrpIjHevVCZSZNpnbcDJxCjDJ9ORvsva
tjvrK2Ay44iH7Bn

pupsxgLRwOZiL9KchAjrNMIGM8rG+IgU2nArM84hS6ASoQKBgQCyjIqS3
+Hhmf5w8V7XOj/7noMK

ZFvOnDLJOGzlpHFgkbgPl+UjPgTt61HVOSu5hcbWxXc4HAbuxziSlNuMC/
ESwhOuWi9dHtt82ziW

17CbHc+yPwM2fEa1lg247hqd8exfC6DKDgdR1mWDPwOGFhOlPWpfLqxrK
tEJoUwgd80z5Q==

-----END RSA PRIVATE KEY-----

The HTML code used for webpage:

```
<!DOCTYPE html>

<html lang="en">

<head>

  <meta charset="UTF-8">

  <title>Demo Login Page</title>


  <!-- Latest compiled and minified CSS -->

  <link                                    rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap.min.css"
integrity="sha384-
BVYiiSIFeK1dGmJRAkycuHAHRg32OmUcww7on3RYdg4Va+PmSTsz/K68
vbdEjh4u" crossorigin="anonymous">
```

```html
<!-- Optional theme -->

<link                                                    rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/css/bootstrap-
theme.min.css"                                              integrity="sha384-
rHyoN1iRsVXV4nD0JutlnGaslCJuC7uwjduW9SVrLvRYooPp2bWYgmgJQIX
wl/Sp" crossorigin="anonymous">


<!-- Latest compiled and minified JavaScript -->

<script
src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.7/js/bootstrap.min.js"
integrity="sha384-
Tc5IQib027qvyjSMfHjOMaLkfuWVxZxUPnCJA7l2mCWNIpG9mGCD8wG
NIcPD7Txa" crossorigin="anonymous"></script>


</head>
<body>
  <div class="container" style="margin-top: 50px; width: 850px;">
    <div class="col-md-6 col-md-offset-3">
      <div class="panel panel-primary">
        <div class="panel-heading">
          <h3>Login</h3>
        </div>


        <div style="padding: 10px;">
          <form action="logging.php" method="post" autocomplete="off">
            <label for="email">Email Address</label><br>
            <input               type="text"                name="email"
placeholder="you@hereandthere.com" class="form-control">
```

```html
        <br>

        <br>

        <label for="password">Password</label><br>

        <input type="password" name="password" class="form-control">


        <br><br>

        <input type="submit" value="Login" class="btn btn-danger btn-block">

      </form>

    </div>

   </div>

  </div>

 </div>

</body>

</html>
```

PHP code to establish connection:

```php
<?php

if ($_SERVER["REQUEST_METHOD"] == "POST")
{
        $servername = "localhost";
    $username = "admin";
    $password = "admin4321";
    $dbname = "exercise";


    $conn = mysqli_connect($servername,$username,$password,$dbname);


    if($conn)
    {
        echo "connection is established.";
    }
    else
    {
        die("Connection Failed ".mysqli_connect_error());
    }
}

?>
```

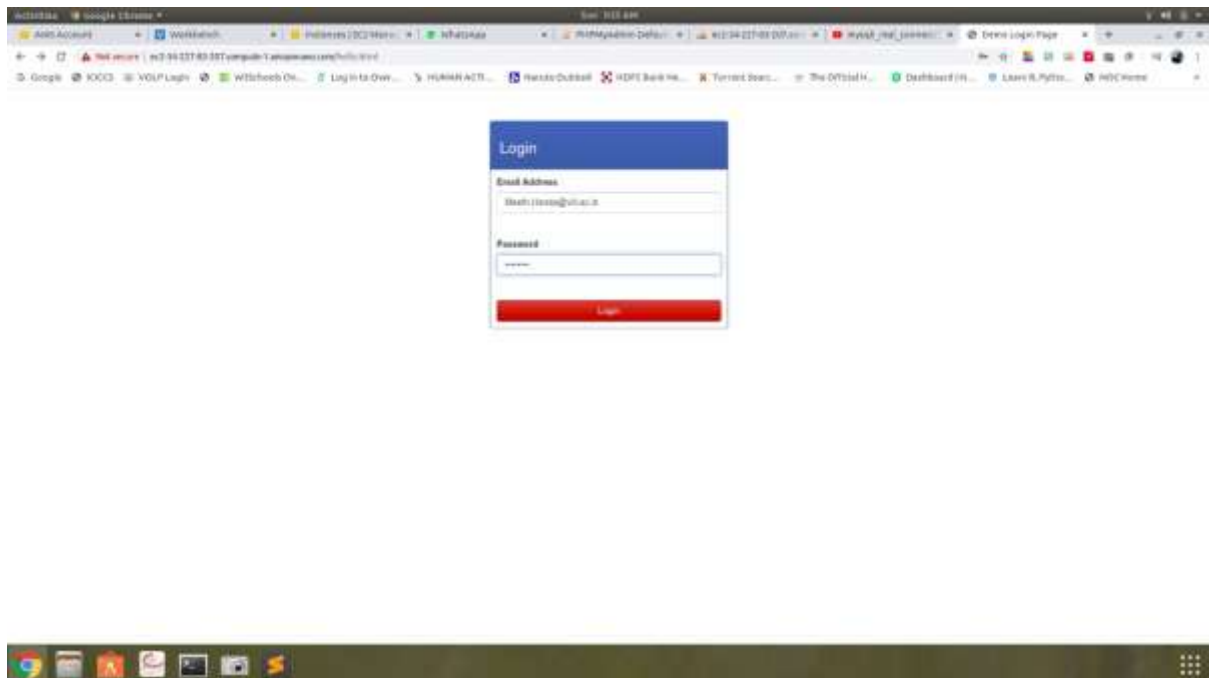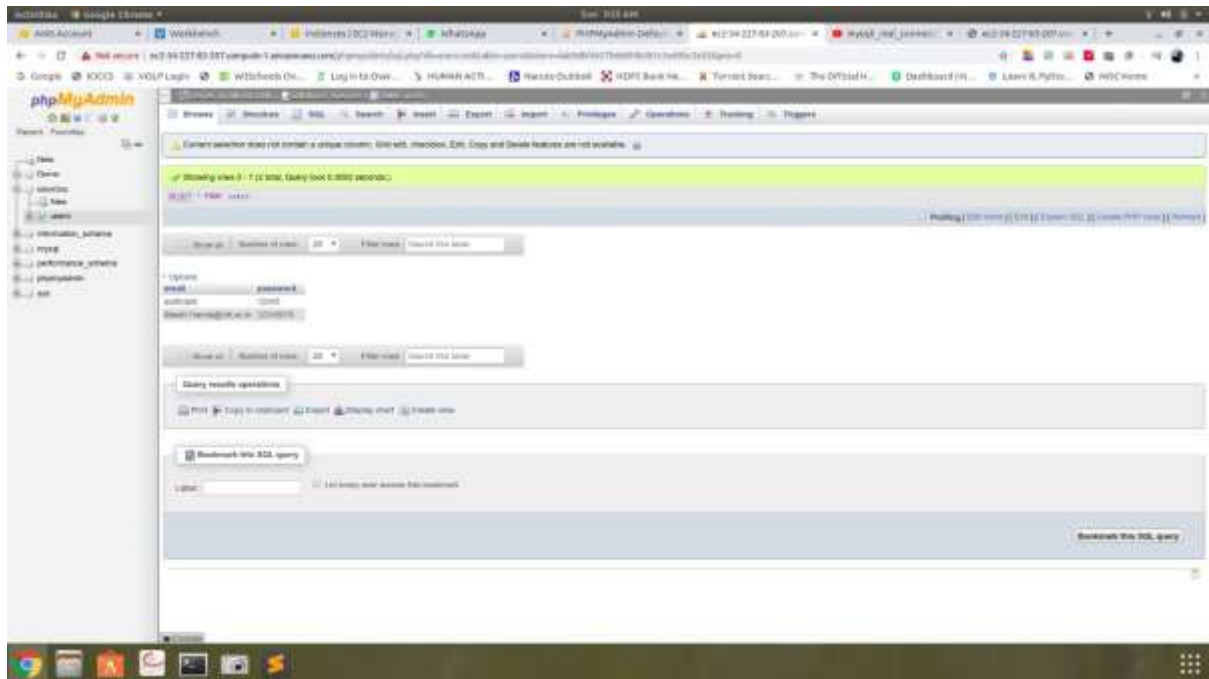PHP code to insert data:

```php
<?php
include("connection.php");


$email = $_POST['email'];
$password = $_POST['password'];


$query = "INSERT INTO users VALUES ('$email','$password')";
$data = mysqli_query($conn, $query);
if($data)
{
        echo "Data is inserted..";
}
else
{
        echo "Problem!!!!";
}
?>
```
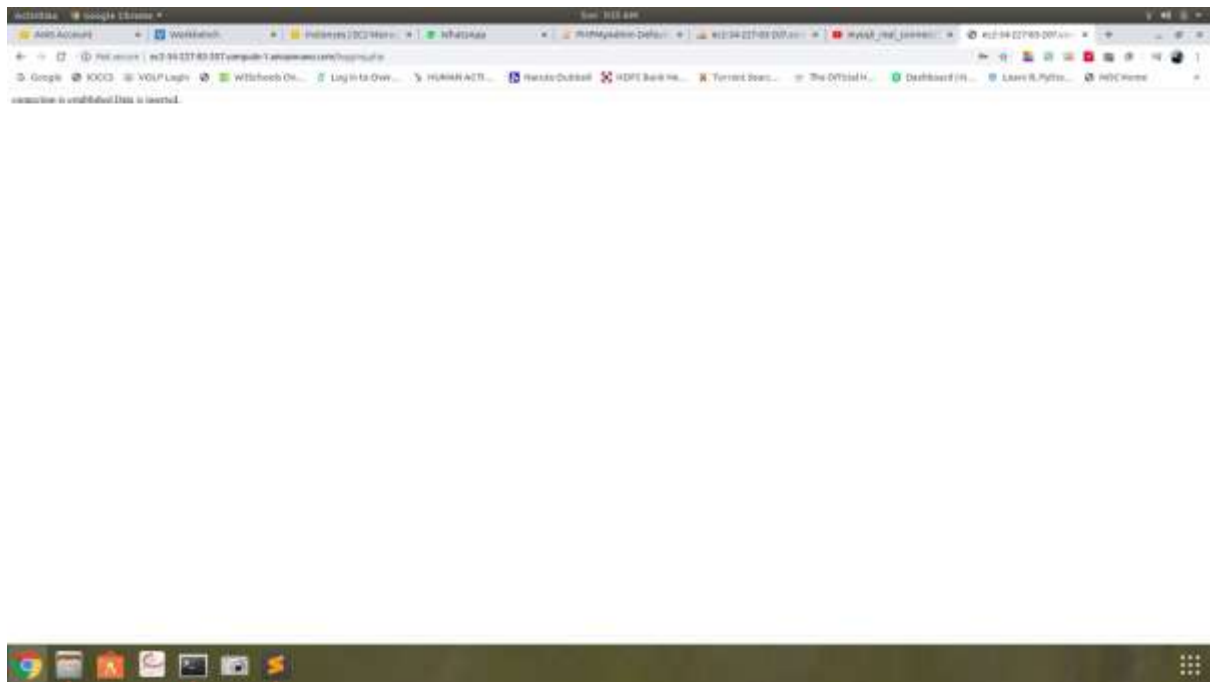
Output Screenshots:

Conclusion:

The EC2 instance is launched successfully using AWS platform.

PHP connection is established and SSH and HTTP are added to the security group of the instance.

Webpage containing a login form is successfully deployed on the virtual server created.