**PROJECT TITLE : BIG DATA ANALYSIS WITH IBM CLOUD DATABASES**

**Phase 3 : Development Part 1**

**Start building the big data analysis solution using IBM Cloud Databases. Create an IBM Cloud account, choose the appropriate database service (e.g., Db2, MongoDB), and set up a database instance. Develop queries or scripts to explore and analyze the selected dataset. Perform basic data cleaning and transformation as needed.**

1. **Create an IBM Cloud Account:**

**If you don’t have an IBM cloud account, sign up for one. You can do this by visiting IBM cloud Website and following the registration process.**

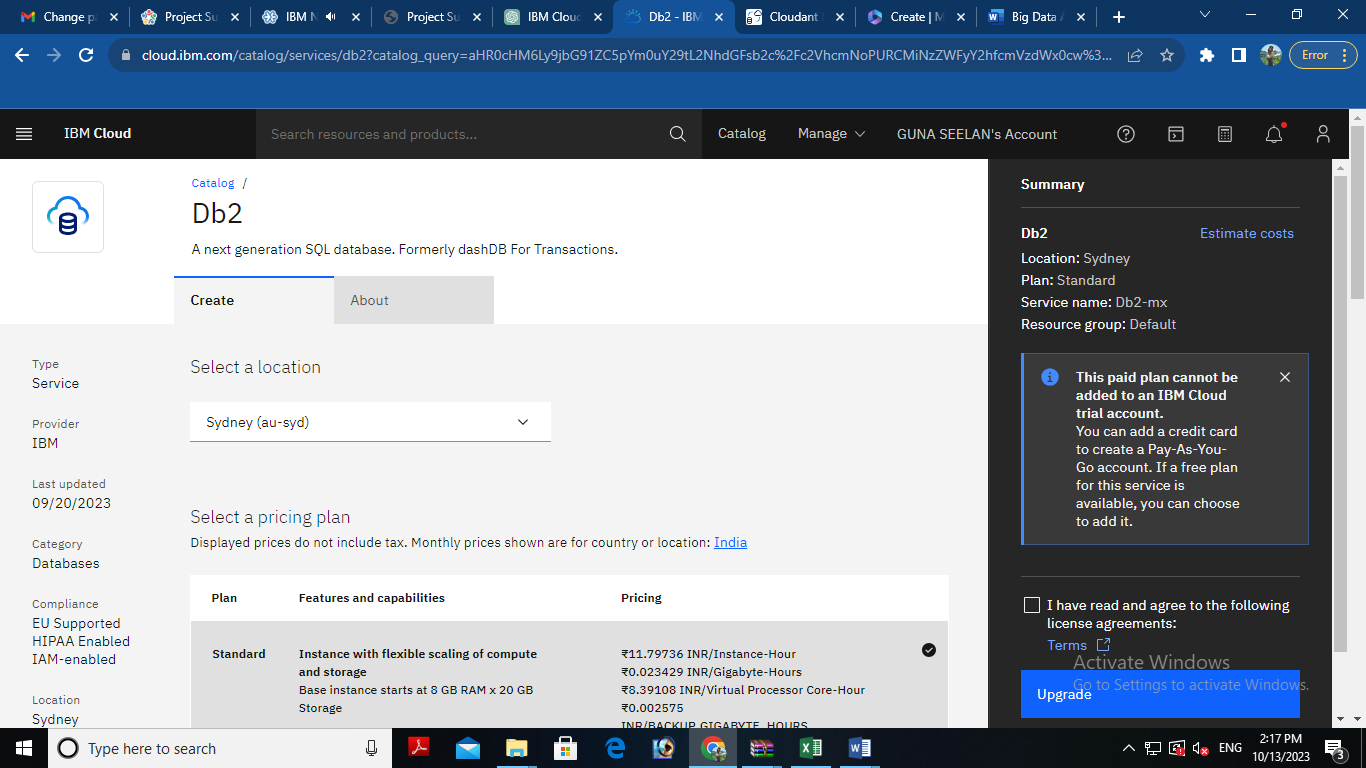
**2. Choose the Appropriate Database Service:**

**Select the IBM Cloud Database service that best suits your project's needs. As mentioned earlier, you can choose between Db2 or MongoDB, depending on your dataset and requirements.**

**3. Set Up a Database Instance:**

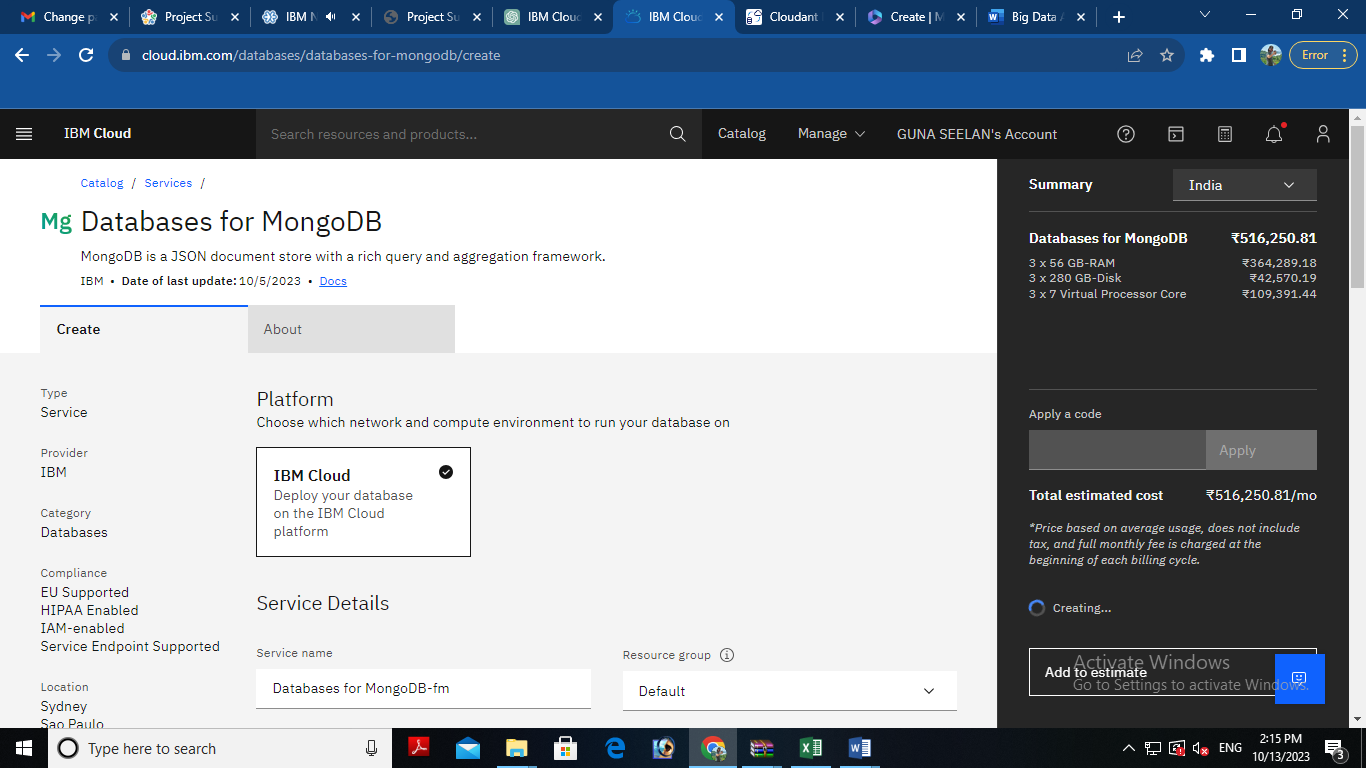
**For Db2:**

* **Log in to your IBM Cloud account.**
* **From the IBM Cloud dashboard, click on the "Create Resource" button.**
* **In the catalog, select "Databases" and then "Db2."**
* **Follow the on-screen instructions to configure your Db2 database instance, including specifying the instance name, region, and other settings.**
* **Create the instance.**

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**For MongoDB:**

* **Log in to your IBM Cloud account.**
* **From the IBM Cloud dashboard, click on the "Create Resource" button.**
* **In the catalog, select "Databases" and then "MongoDB."**
* **Follow the on-screen instructions to configure your MongoDB database instance, including specifying the instance name, region, and other settings.**
* **Create the instance.**

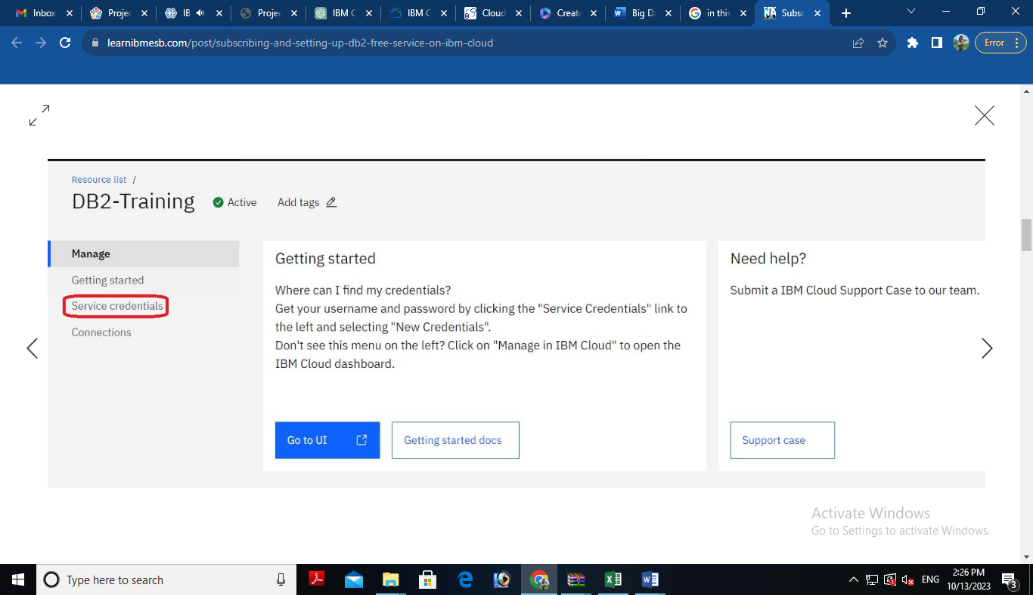
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**4. Develop Queries or Scripts:**

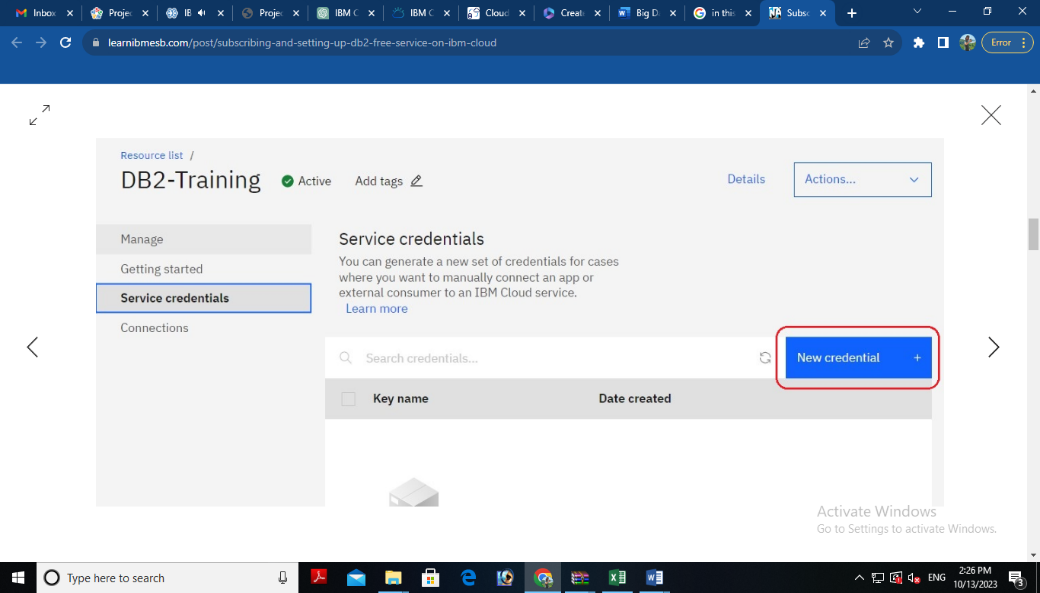
**After setting up your database instance, you can start developing queries or scripts to explore and analyze your dataset. The type of queries and scripts you write will depend on the nature of your dataset and your analysis goals. You can use SQL for Db2 or MongoDB's query language for MongoDB.**

## **Creating Service Credentials the IBM DB2 database**

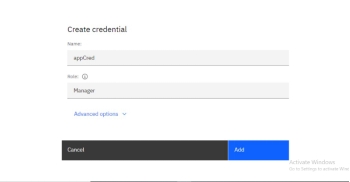
* In the resource list screen of IBM Cloud, click on the DB2 service (displayed under Services and software category) that you created
* From the service page, select the menu option "**Service Credentials**" to create / access the credentials of the db2 database

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* Click on **New Credential** button in the Service Credential page to create a new credential

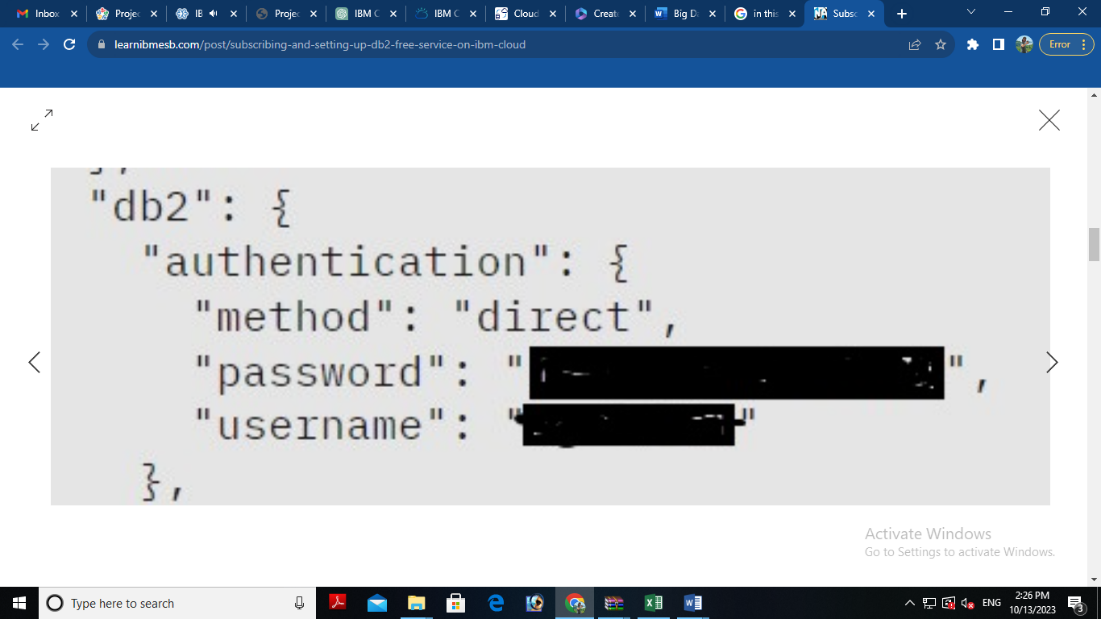


* **Provide the any name for service credential (e.g. appCred) and click on Add**



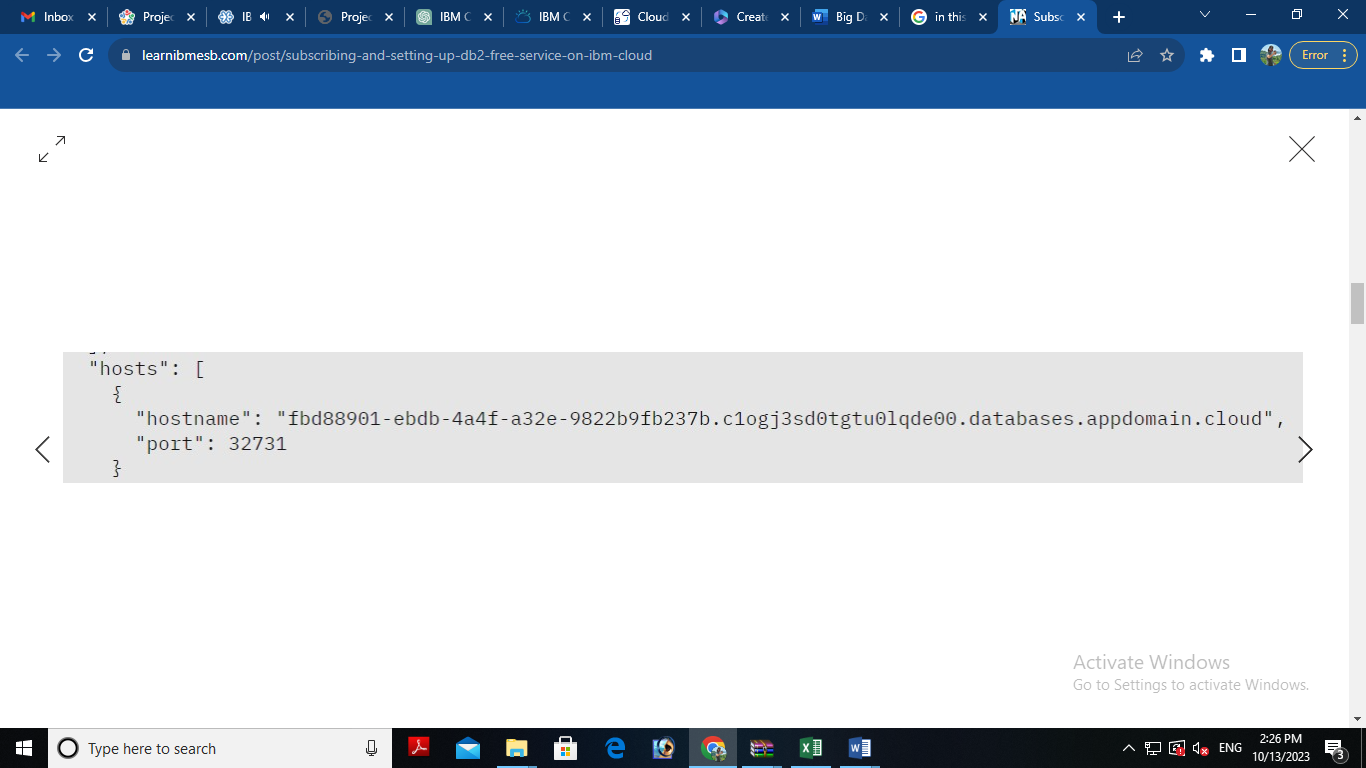
New credential gets created and is displayed. Expand the newly to created credential to get the all the details that is required for client application to connect to the database.

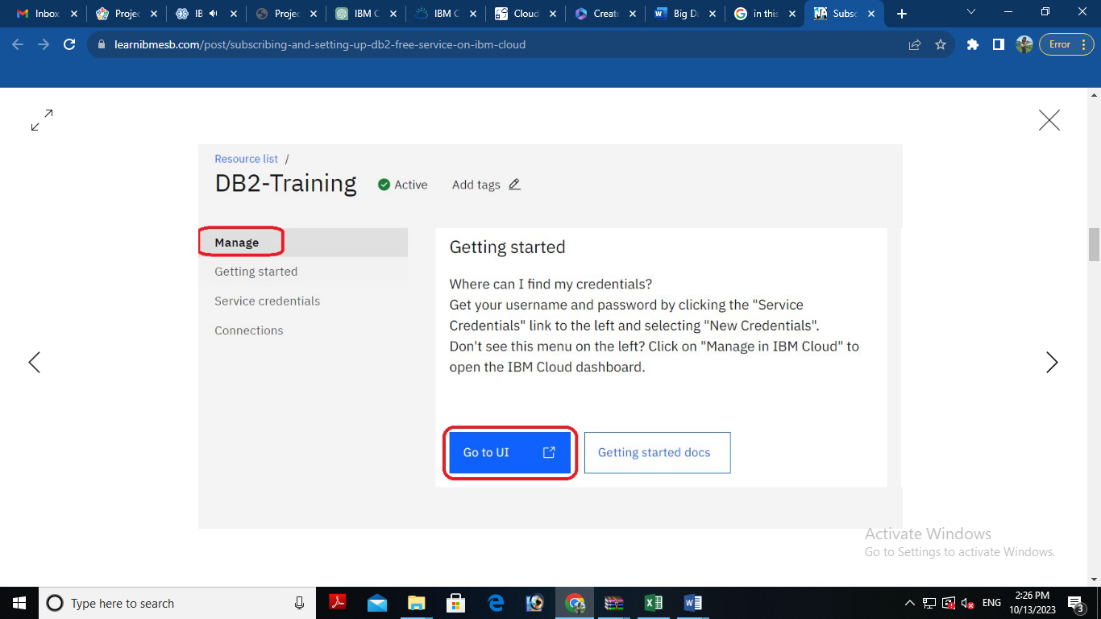
|  |  |
| --- | --- |
| **Property Name** | **Value** |
| **Database name** | *<database> [e.g. bludb]* |
| **Host name** | *<hostname>* |
| **Port** | *<port>* |
| **User Name** | *<username>* |
| **Password** | *<password>* |

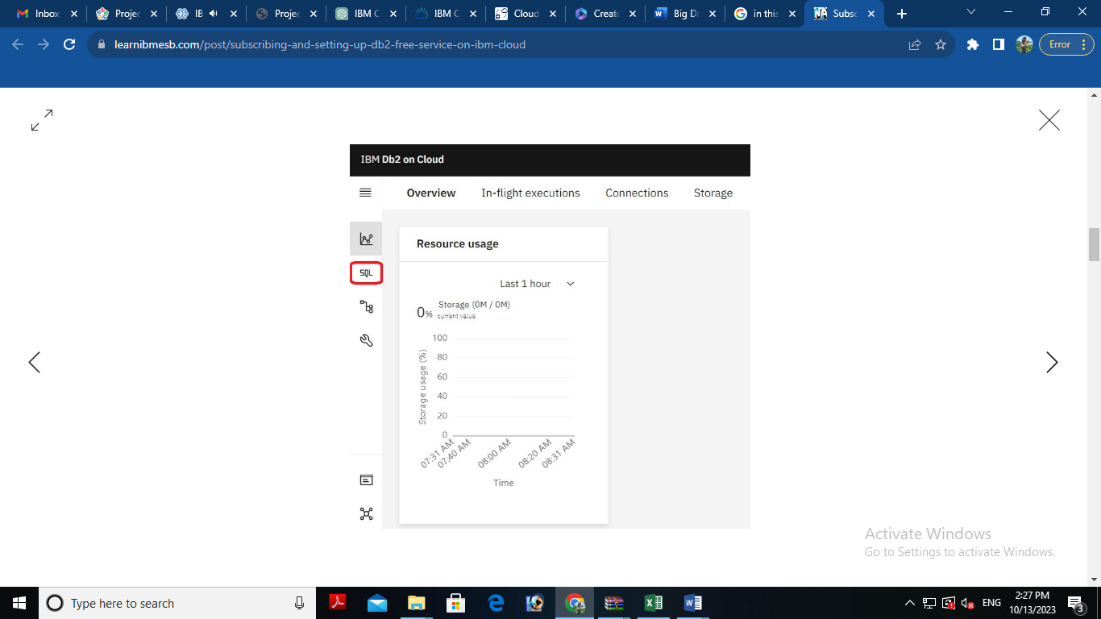


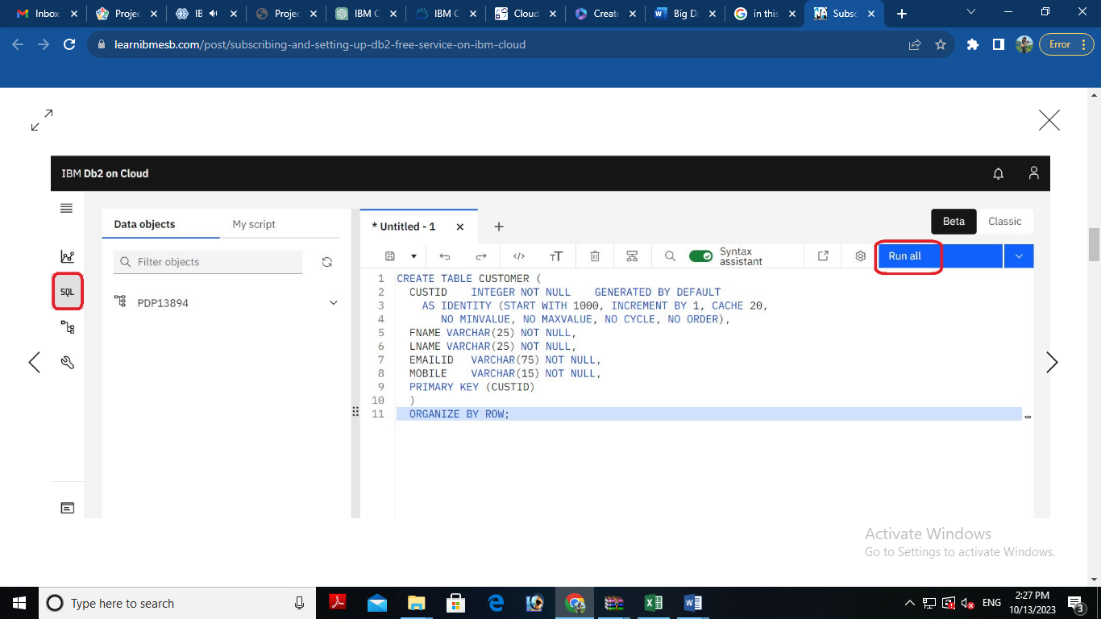
## **3. Setting up IBM DB2 database**

* In the resource list screen of IBM Cloud, click on the DB2 service (displayed under Services and software category) that you created, if the page is not already opened.
* From the service page, select the menu option "**Manage**" and click on Go to UI to launch the DB2 console

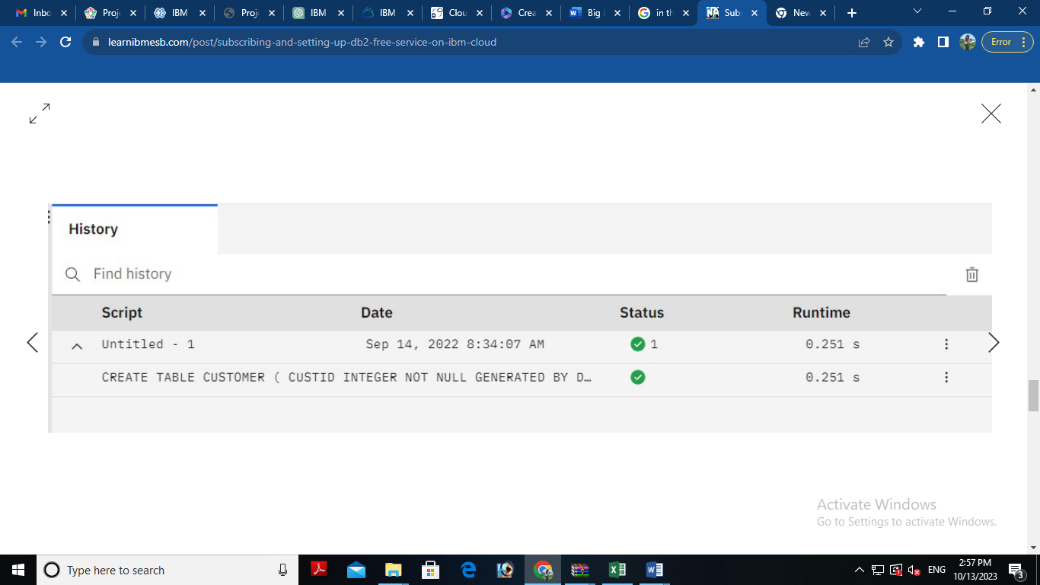
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* **IBM DB2 on cloud console is opened. To create database objects, click on SQL menu option from the left-side menu.** ****
* **SQL editor is opened up for you. Type the query that you want to execute in the SQL editor and click Run all**

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* **The status of the query execution is displayed at the bottom of the SQL editor as shown below**

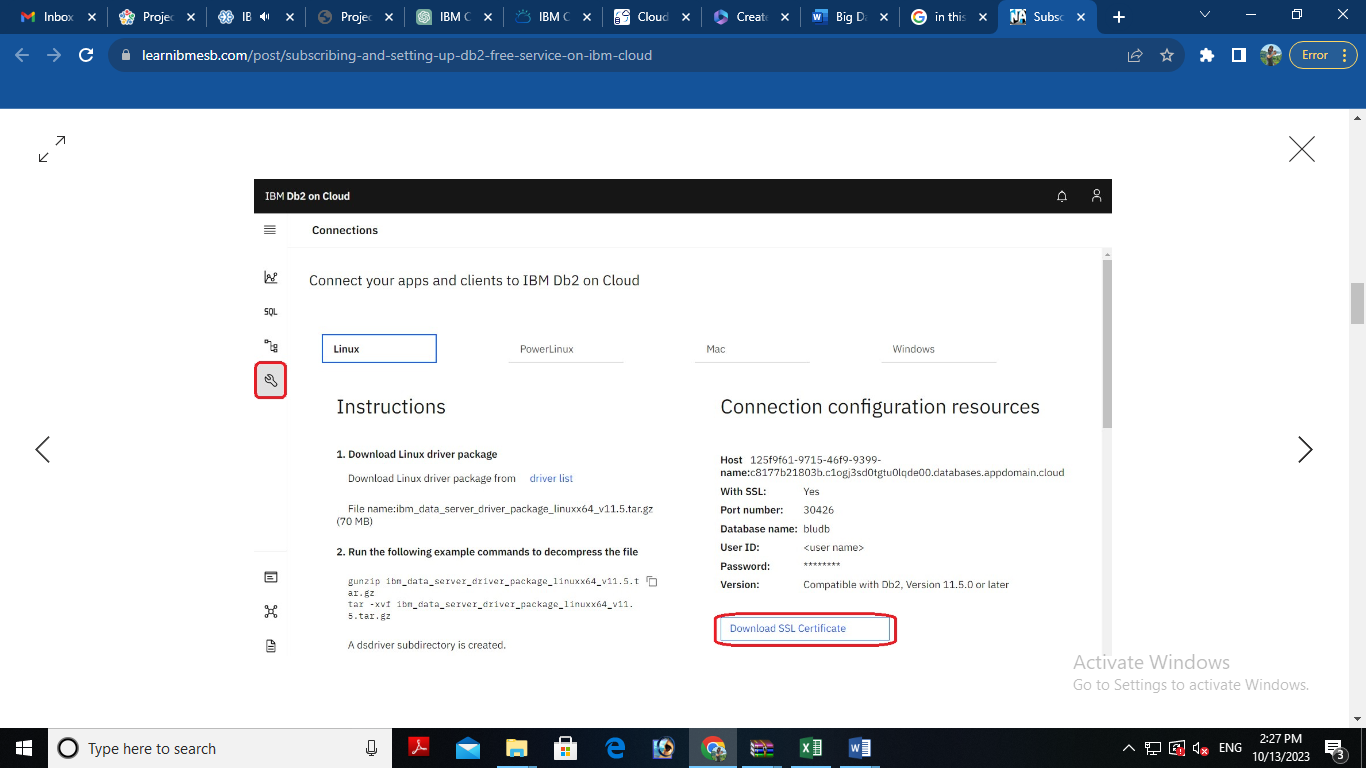
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## **4. Downloading DB2 SSL Certificate and converting to PEM format**

**In the console for IBM DB2, click on the spanner like icon which denotes Administration. On the resulting page, click on Download SSL Certificate button**

**The SSL Certificate gets downloaded into the local machine, which is in DER format (cert file). To convert the cert file to PEM format, we can use the link SSL Converter - Convert SSL Certificates to different formats.**

* **In the SSL Converter website specify the following**
* **Certificate File to Convert: Upload the downloaded certificate file**
* **Type of Current Certificate: DER/Binary**
* **Type To Convert To: Standard PEM**
* **Click on Convert Certificate button to download the certificate in PEM format.**

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**5. Perform Data Cleaning and Transformation:**

**As part of your data analysis, you may need to perform data cleaning and transformation. This can involve removing duplicates, handling missing data, and converting data types. The specific data cleaning and transformation tasks will depend on your dataset and analysis requirements. Remember that I can provide guidance, answer questions, and help with SQL queries or MongoDB queries if you encounter specific issues during your project. Feel free to ask for assistance with any part of your project, and I'll do my best to help you successfully complete it.**

**Basic Data Retrieval**

**SELECT \***

**FROM climate\_data**

**WHERE location = 'YourLocation'**

**AND date BETWEEN 'StartDate' AND 'EndDate';**

**Average Temperature**

**SELECT AVG(temperature) AS average\_temperature**

**FROM climate\_data**

**WHERE location = 'YourLocation'**

**AND date BETWEEN 'StartDate' AND 'EndDate';**

**Maximum Temperature**

**SELECT MAX(temperature) AS max\_temperature**

**FROM climate\_data**

**WHERE location = 'YourLocation'**

**AND date BETWEEN 'StartDate' AND 'EndDate';**

**Minimum Temperature**

**SELECT MIN(temperature) AS min\_temperature**

**FROM climate\_data**

**WHERE location = 'YourLocation'**

**AND date BETWEEN 'StartDate' AND 'EndDate';**

**Precipitation Sum**

**SELECT SUM(precipitation) AS total\_precipitation**

**FROM climate\_data**

**WHERE location = 'YourLocation'**

**AND date BETWEEN 'StartDate' AND 'EndDate';**

**Monthly Average Temperature**

**SELECT EXTRACT(MONTH FROM date) AS month, AVG(temperature) AS average\_temperature**

**FROM climate\_data**

**WHERE location = 'YourLocation'**

**AND EXTRACT(YEAR FROM date) = 'Year'**

**GROUP BY EXTRACT(MONTH FROM date)**

**ORDER BY month;**

**Trend Analysis**

**SELECT YEAR(date) AS year, AVG(temperature) AS average\_temperature**

**FROM climate\_data**

**WHERE location = 'YourLocation'**

**GROUP BY YEAR(date)**

**ORDER BY year;**