

**Diploma in**

**IT, Networking and Cloud**

**Elective Module 1**

**Cloud Application Developer**

**Lab Manual**

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## Learning Outcome

After completing this module, the student should be **Able to understand the Cloud, Architecture, App Development & Deployment in cloud environment.**

To meet the learning outcome, a student must complete the following activities

1. Create cloud account on IBM cloud and creating custom dashboard
2. Understanding IBM db2. Creating a database & running SQL query on IBM db2.
3. Create a chatbot using IBM Watson.
4. Create an object storage instance in IBM cloud.
5. Create a database and document using cloudant.
6. Load an external data(CSV) using db2.
7. Bluemix with cloudant.
8. Convert text to speech in IBM Cloud.
9. Perform operations on data using IBM Cloud Data Engine.
10. Create access groups in IBM Cloud using IAM.
11. Invite users and add them in access groups using IAM in IBM Cloud.
12. Customize your IBM Cloud Dashboard.

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## Activity 1

**Aim:** Create cloud account on IBM cloud and creating custom dashboard.

**Learning outcome:** Able to understand the Cloud, Architecture, App Development & Deployment in cloud environment.

**Duration:** 2 hours

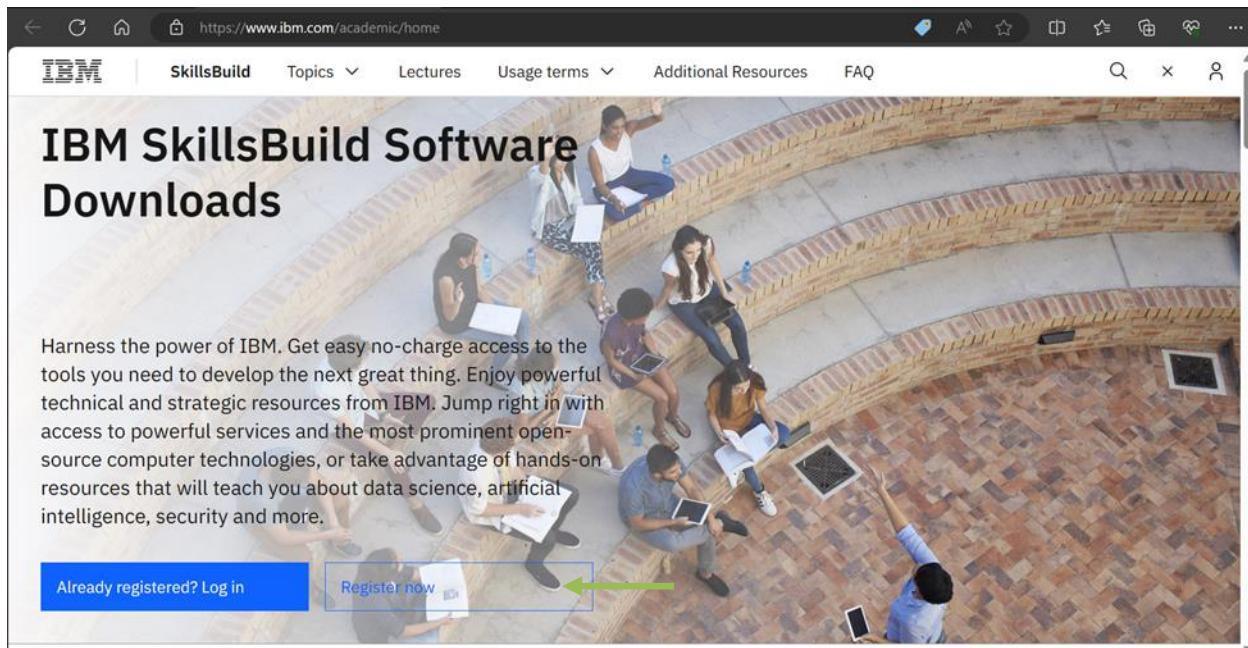
### List of Hardware/Software requirements:

1. Laptop / Desktop with windows 10
2. Internet

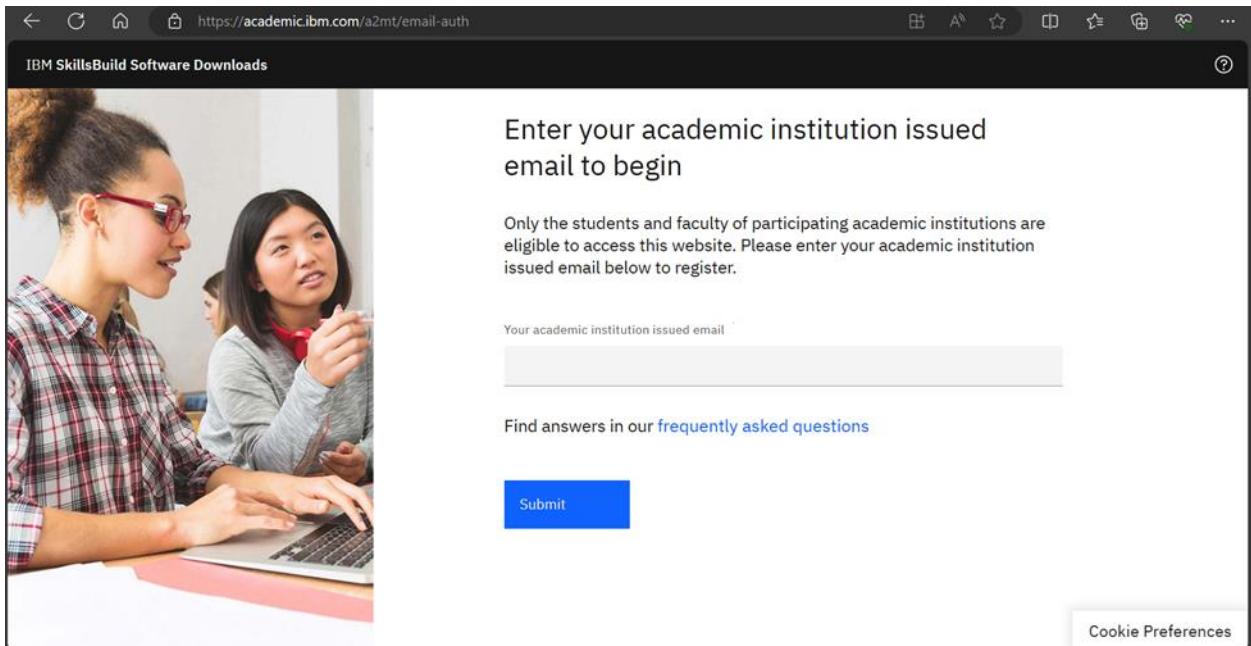
### Code/Program/Procedure (with comments):

#### Create cloud account on IBM cloud

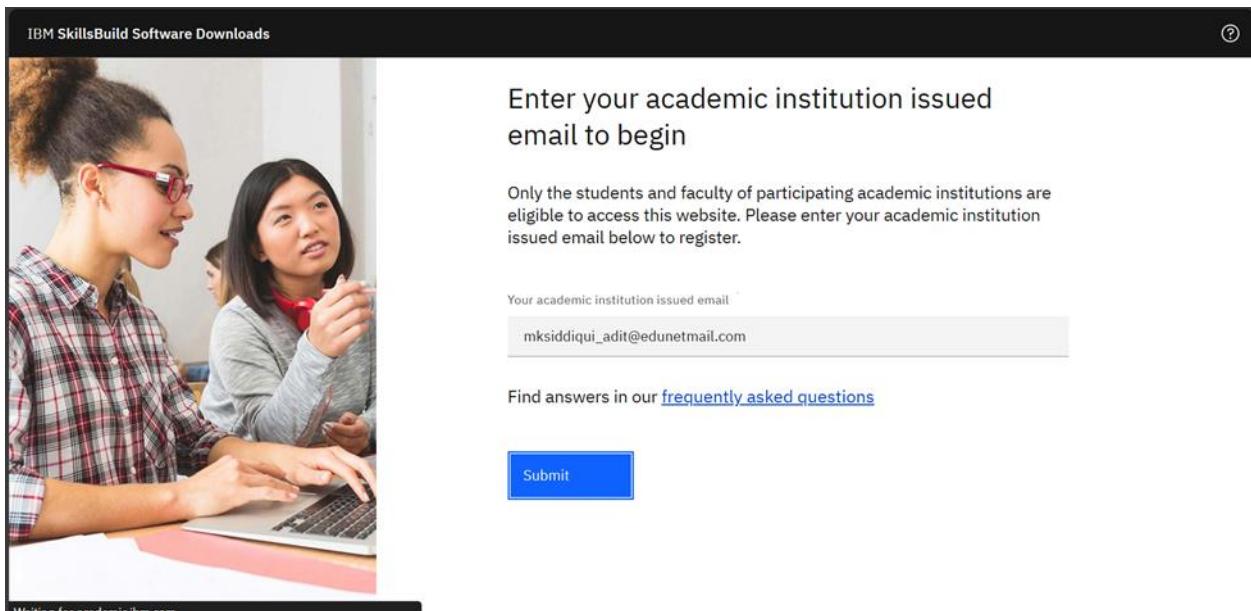
1. Open [IBM SkillsBuild Software Downloads](https://www.ibm.com/academic/home) in a browser
2. This takes you to a dashboard.



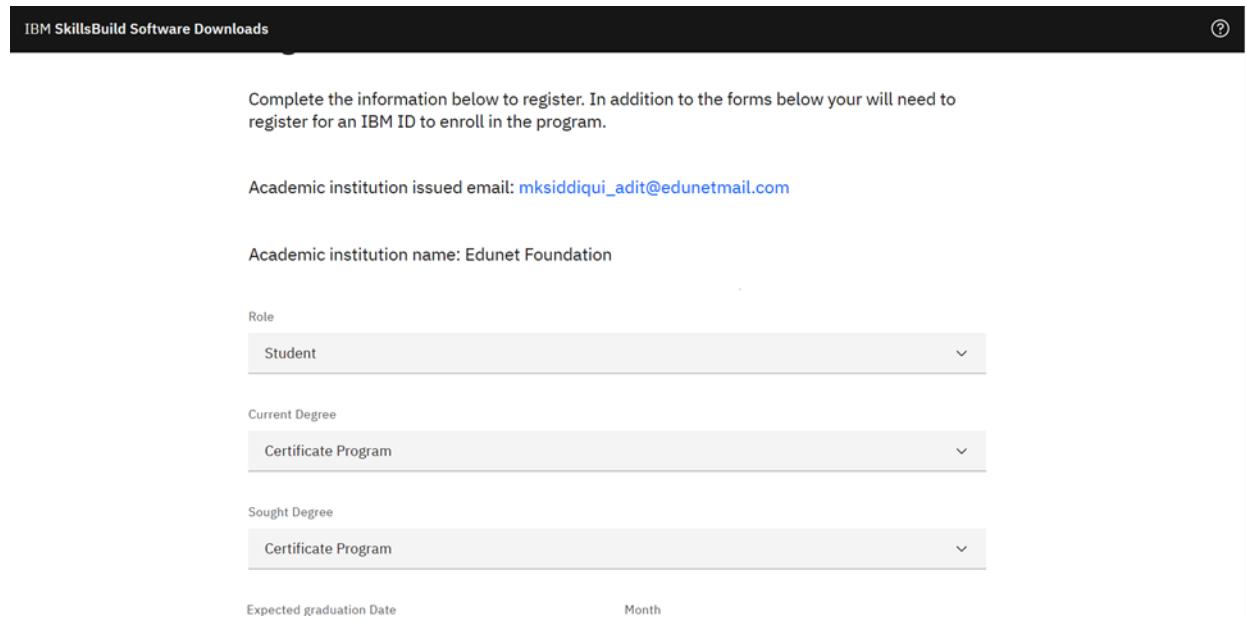
3. Click on **Register now**. And you are redirected to such a window.



4. Use your **official id** to register.



- 
5. Click on **Submit**
  6. Select
    - a. Role: **Student**
    - b. Current Degree: **Certificate Program**
    - c. Sought Degree: **Certificate Program**
    - d. Expected Graduation Date: **2024**
    - e. Expected Month: **September**
    - f. Enroll me: **Yes**
    - g. You will need to open the terms & privacy to accept.



The screenshot shows a registration form for the IBM SkillsBuild Software Downloads. At the top, there's a header bar with the text "IBM SkillsBuild Software Downloads" and a help icon. Below the header, a message says: "Complete the information below to register. In addition to the forms below your will need to register for an IBM ID to enroll in the program." It asks for the academic institution issued email, which is "mksiddiqui\_adit@edunetmail.com". The academic institution name is listed as "Edunet Foundation". The form includes dropdown menus for selecting the role ("Student"), current degree ("Certificate Program"), and sought degree ("Certificate Program"). There are also fields for "Expected graduation Date" and "Month". A vertical scroll bar is visible on the right side of the form.

IBM SkillsBuild Software Downloads

---

Expected graduation Date      Month

2024      Sep

Department

Computer Science

Enroll me in the IBM badge program. [What is this?](#)

Yes  
 No

Please click on the links below to read and accept the program agreement and privacy statement

I agree to the [Software Downloads terms of service](#)  
 I agree to the [privacy consent](#)

**Register**

IBM SkillsBuild Software Downloads

---

Expected grad Date: 2024

Department: Computer Science

Enroll me in the IBM badge program?  Yes  No

Please click on the links below to read and accept the program agreement and privacy statement

I agree to the [Software Downloads terms of service](#)  
 I agree to the [privacy consent](#)

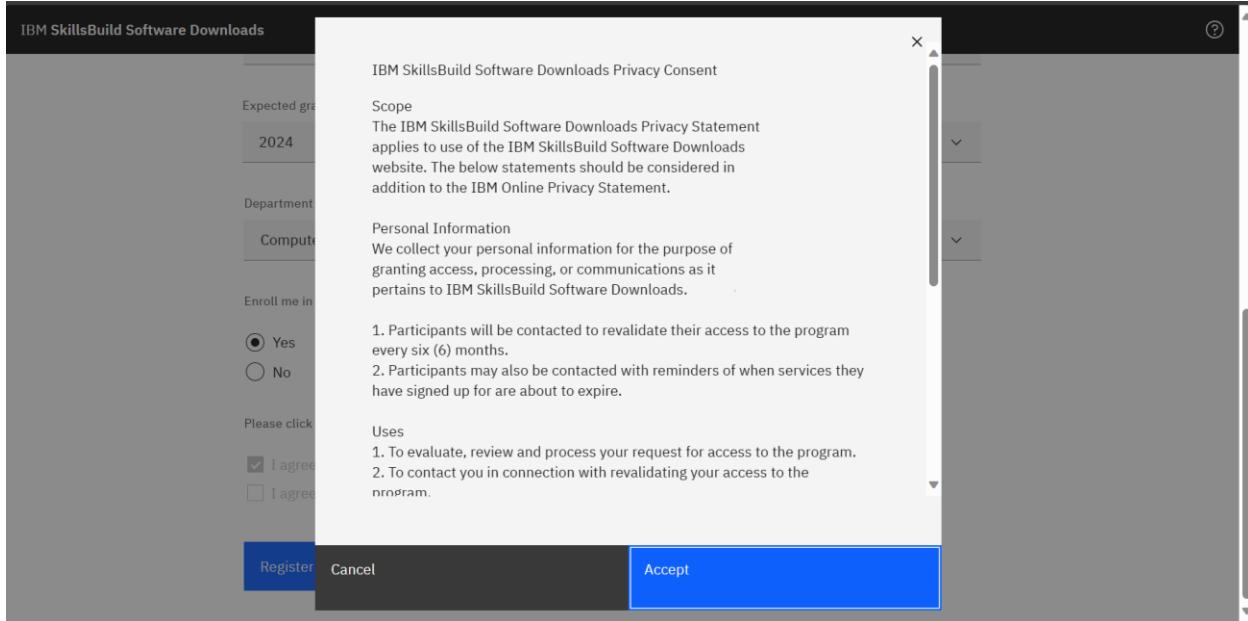
**Register** **Cancel** **Accept**

IBM SkillsBuild Software Downloads Agreement

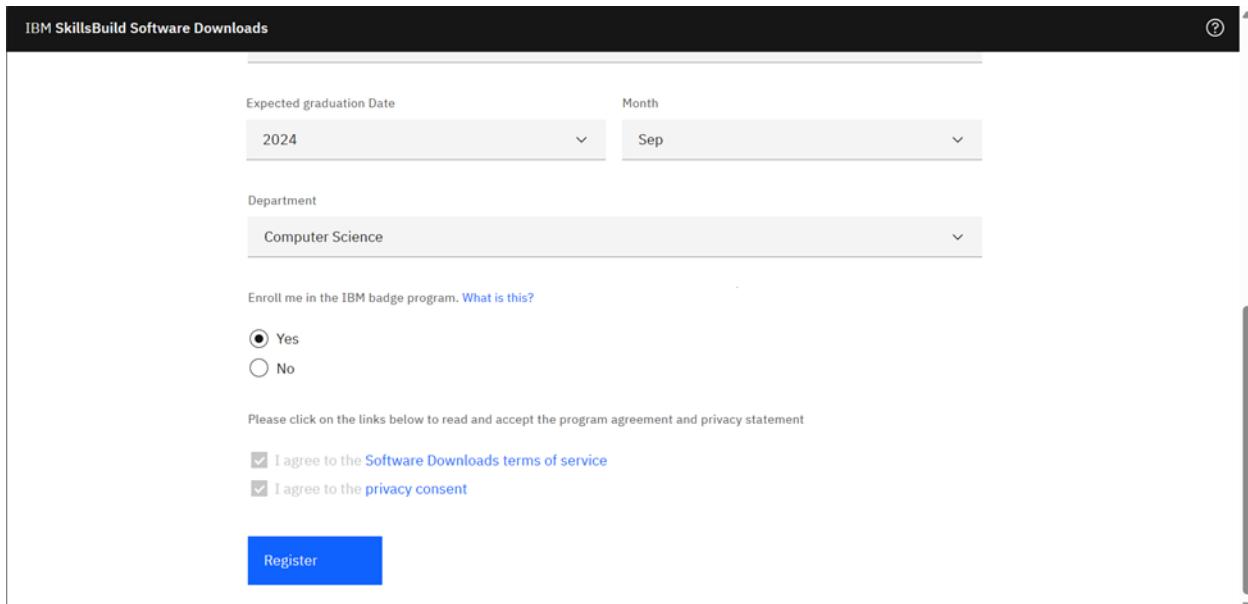
The purpose of this IBM SkillsBuild Software Downloads agreement ("Agreement") is to make available certain software, resources, cloud services for educational and non-commercial research only to qualifying students, employees or contractors with educational institutions. As an authorized representative, you accept the terms of this Agreement by completing the registration process at [ibm.biz/academic](http://ibm.biz/academic).

This Agreement and any IBM license agreements or any other agreements under which Eligible Resources are made available are the complete agreement between you and IBM regarding the use of those Eligible Resources. This Agreement replaces any prior oral or written communications between you and IBM regarding this offering. If there is a conflict between any of the terms of other applicable licenses and agreements and those of this Agreement, the terms of this Agreement prevail to the extent that the terms conflict.

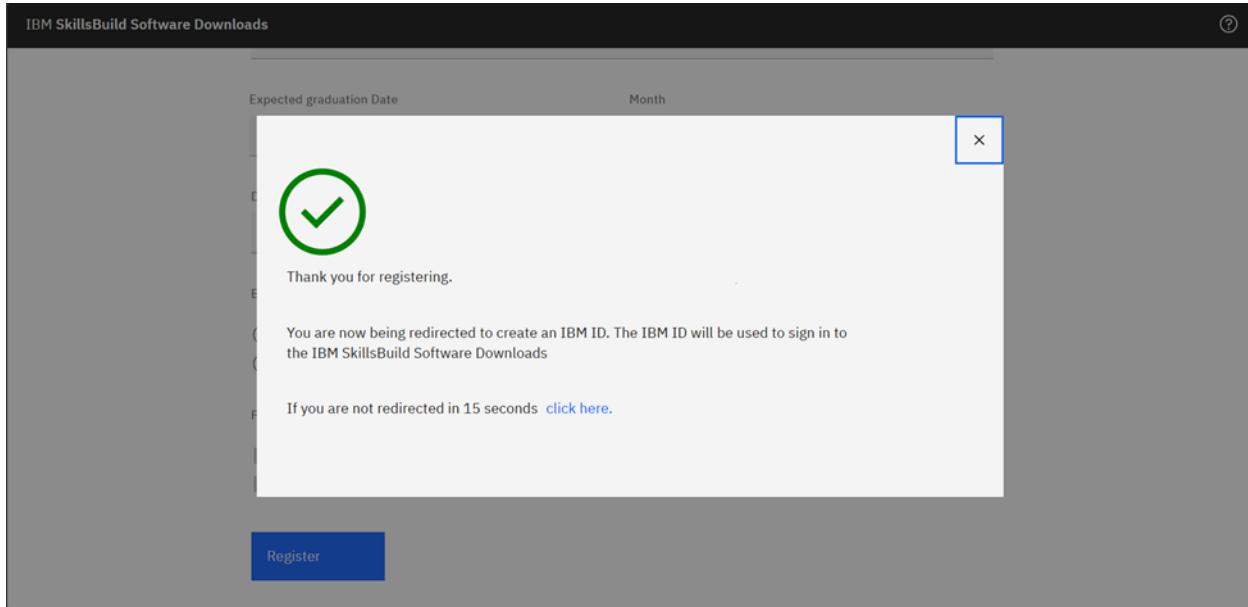
**Definitions**



## 7. This will check both.



## 8. Click on register



## 9. This redirects you to a details page. Fill in your details. Create a password of at least 12 characters with upper case, a small case, a number & a special character.

AutoFill with LinkedIn

E-mail (i)

mksiddiqui\_adit@edunetmail.com (i) ✓

We'll send you a 7 digit code that you'll use to verify your email in step 3.

First name

Mohammad Kashif

Last name

Siddiqui

Password

..... (i) ✓ ⚡

Country or region of residence

India

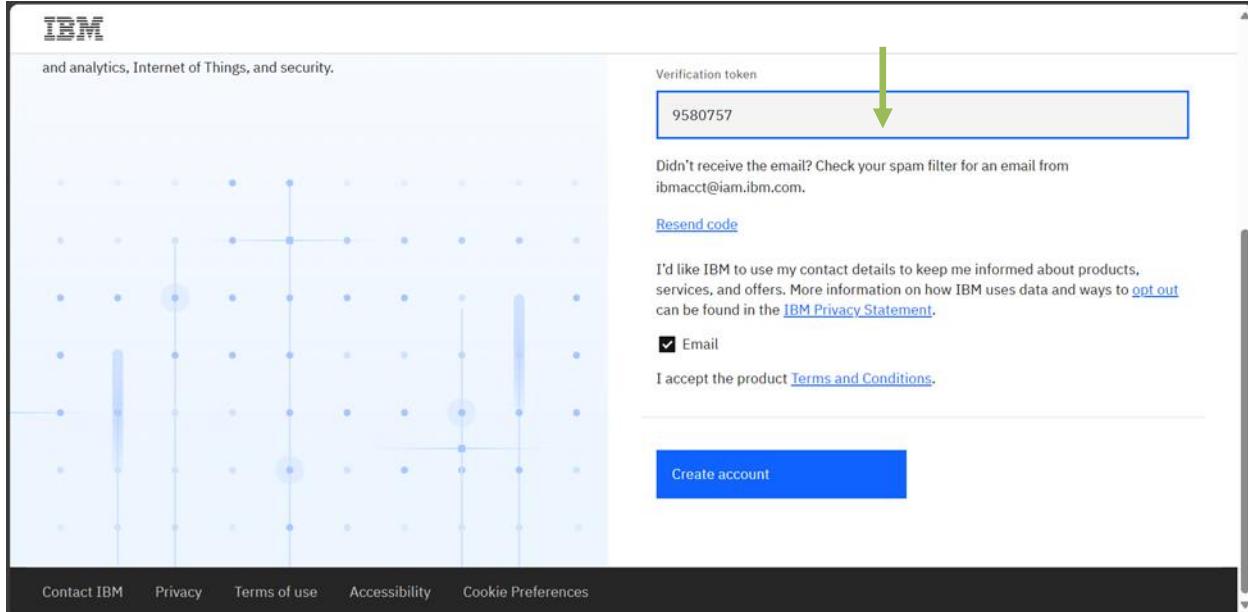
Next

## 10. Professional information- your Organization. Put in Edunet Foundation

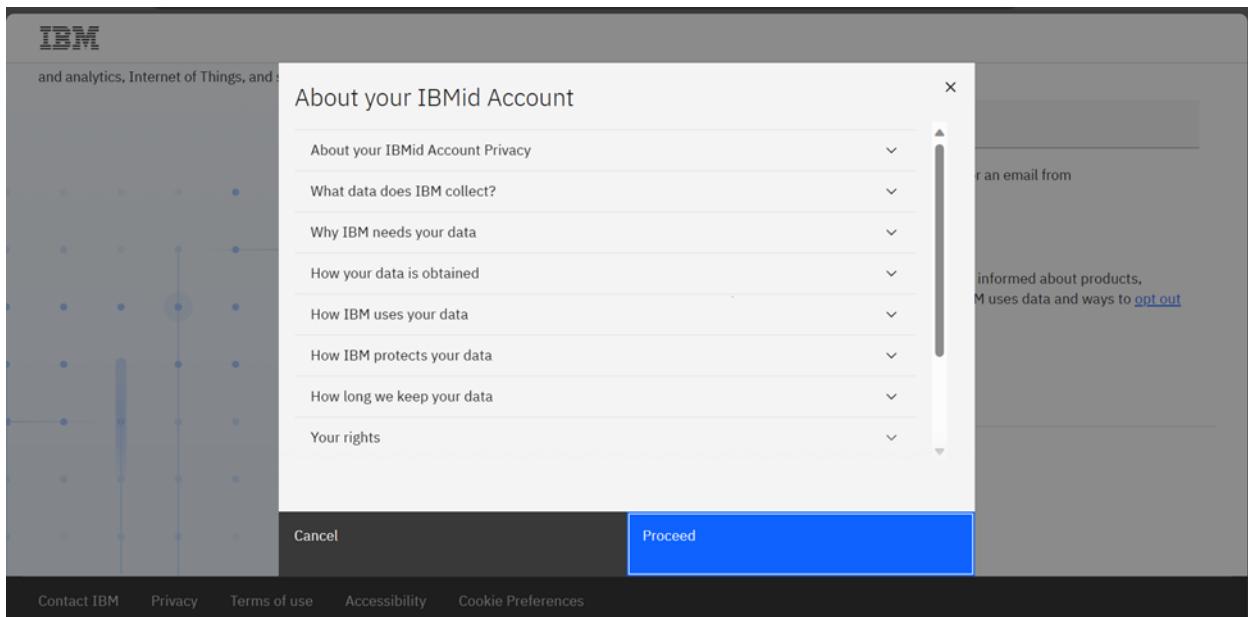
The screenshot shows the 'IBM SkillsBuild Software Downloads' page. At the top, there's a heading 'IBM SkillsBuild Software Downloads' and a link 'Already have an IBM account? [Log in](#)'. Below this, there are two expandable sections: 'Account information' (selected) and 'Additional information'. Under 'Account information', there is a 'Company' field containing 'Edunet Foundation', which is highlighted with a blue border. Below the company field is a 'Next' button. Further down, there's a section titled '3. Verify email' with a 'Create account' button.

## 11. You need to verify your mail now. Check your mailbox for a code from IBM. Copy the code & fill in the verification code, to **CREATE account**.

The screenshot shows the 'edunet foundation' email inbox. The left sidebar includes links for Mail, Contacts, Calendar, Tasks, Preferences, and Mail Folders (Inbox, Sent, Drafts, Junk, Trash). The inbox lists one message from 'IBM Security' with the subject 'New User Registration - IBMid: Confirmation code IBM id C...' and the time '15:39'. A tooltip says 'To view a message, click on it.' The top right corner shows the user's email address 'mksiddiqui a...tmail.com' and a search bar.



## 12. Privacy information, and PROCEED



## 13. It might take a few minutes to create the account.

## 14. You would receive another code in your mailbox. Fill in the code and verify (only the last 6 digits).

IBM

## Enter code sent to your email

For added security, we sent a 6-digit code to mks\*\*\*\*\*@edunetmail.com.  
Please enter the code below within 20 minutes

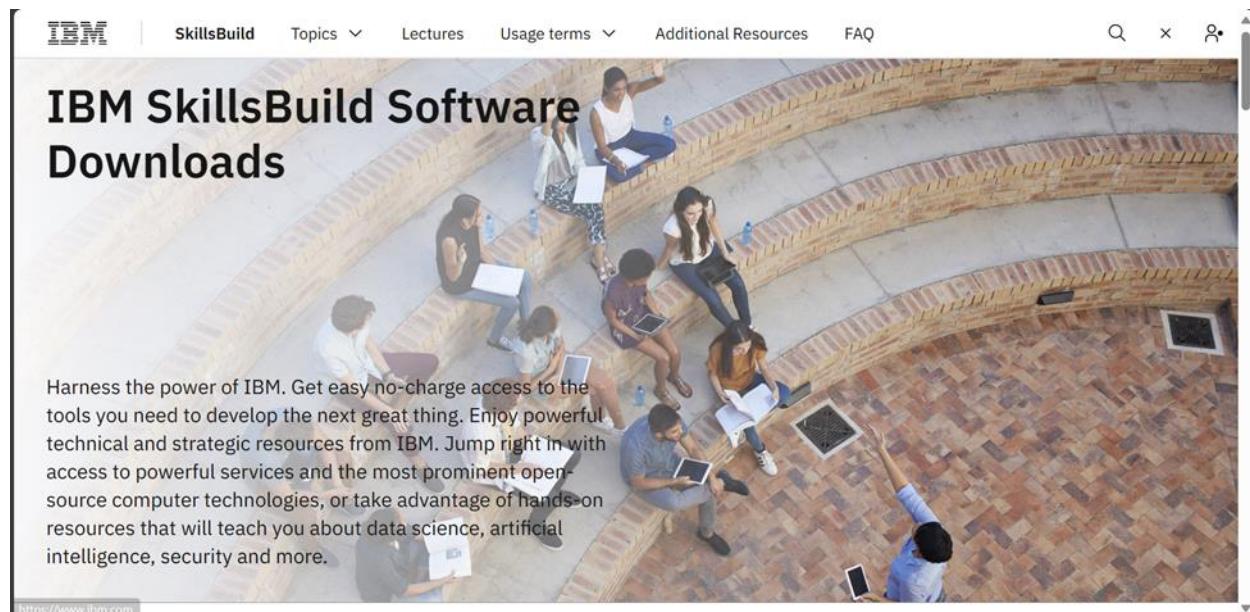
Enter email code

7851-

[Verify](#)

[Didn't receive the email?](#)  
Check your spam filter for an email from  
ibmacct@iam.ibm.com  
[Resend code](#)

15. This redirects you to the **homepage of IBM academics**



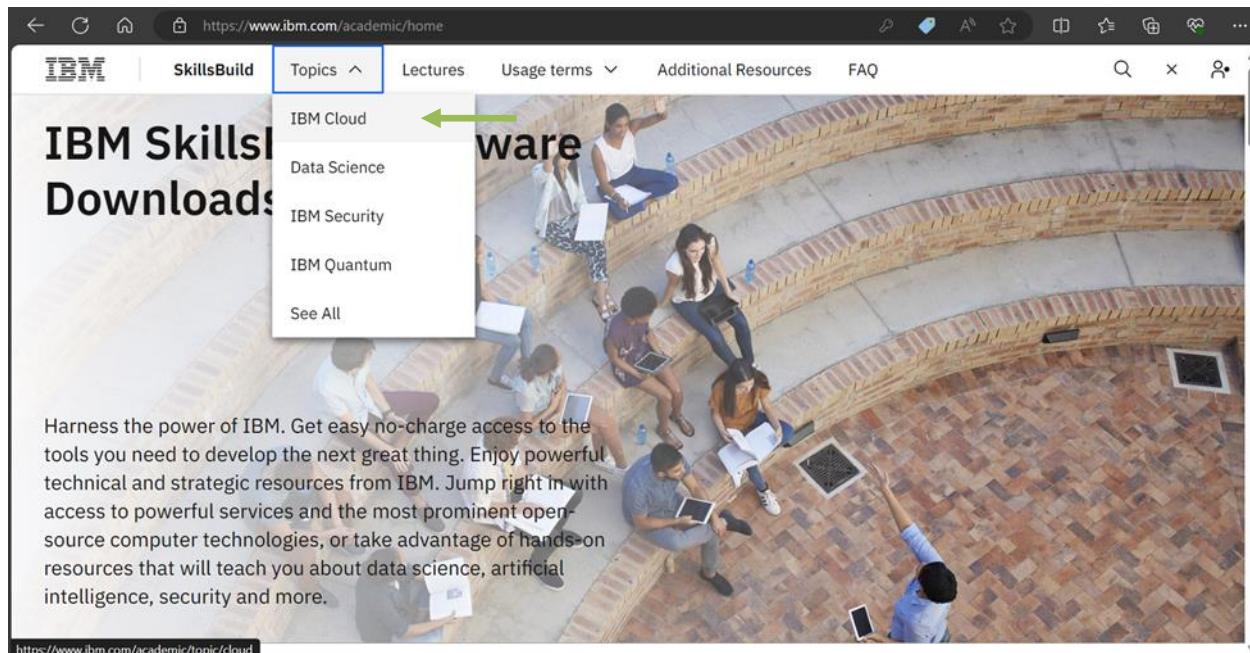
IBM | SkillsBuild Topics Lectures Usage terms Additional Resources FAQ

## IBM SkillsBuild Software Downloads

Harness the power of IBM. Get easy no-charge access to the tools you need to develop the next great thing. Enjoy powerful technical and strategic resources from IBM. Jump right in with access to powerful services and the most prominent open-source computer technologies, or take advantage of hands-on resources that will teach you about data science, artificial intelligence, security and more.

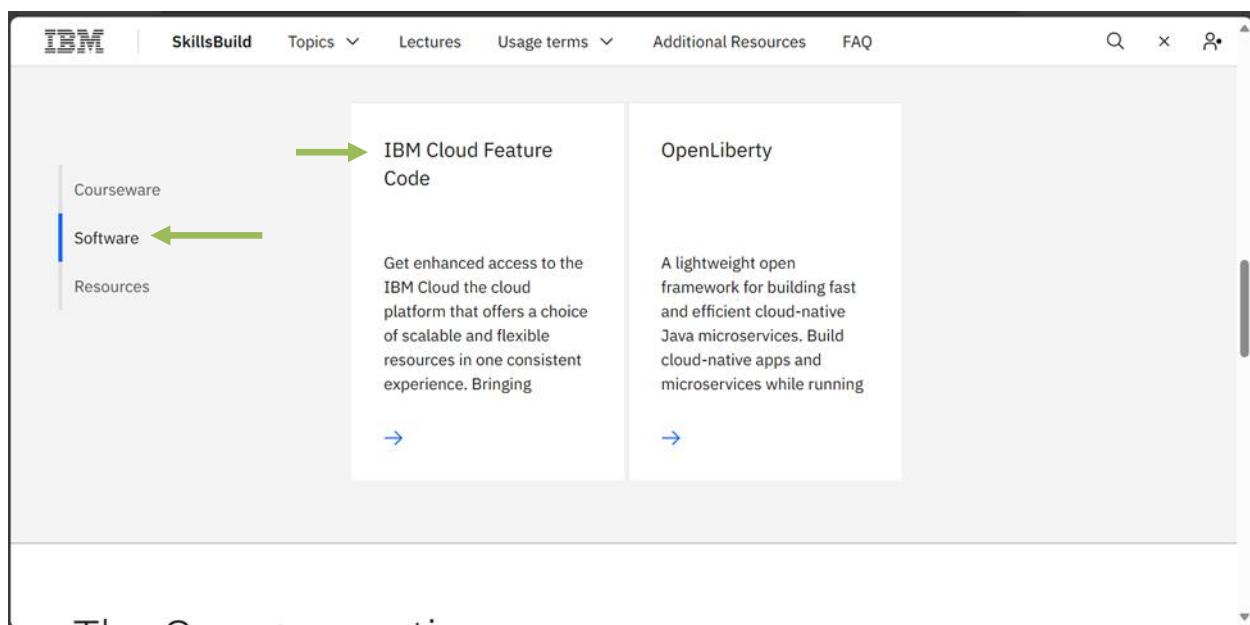
<https://www.ibm.com>

## 16. Under topics, check IBM Cloud



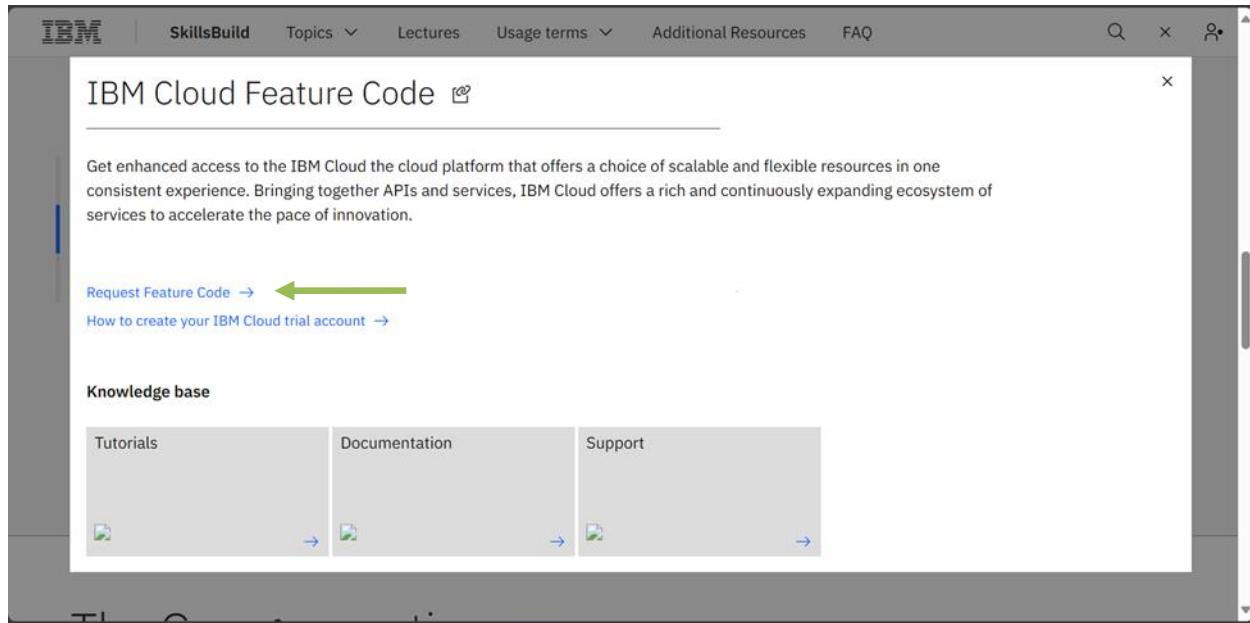
The screenshot shows the IBM Academic homepage at <https://www.ibm.com/academic/home>. The 'Topics' dropdown menu is open, and the option 'IBM Cloud' is highlighted with a green arrow. The main content area features a photograph of students sitting on a brick wall outdoors, with the word 'ware' partially visible in the background. A descriptive text block below the image reads: 'Harness the power of IBM. Get easy no-charge access to the tools you need to develop the next great thing. Enjoy powerful technical and strategic resources from IBM. Jump right in with access to powerful services and the most prominent open-source computer technologies, or take advantage of hands-on resources that will teach you about data science, artificial intelligence, security and more.'

## 17. Slide down to find the Courseware. Navigate to Software, and check IBM Cloud Feature Code



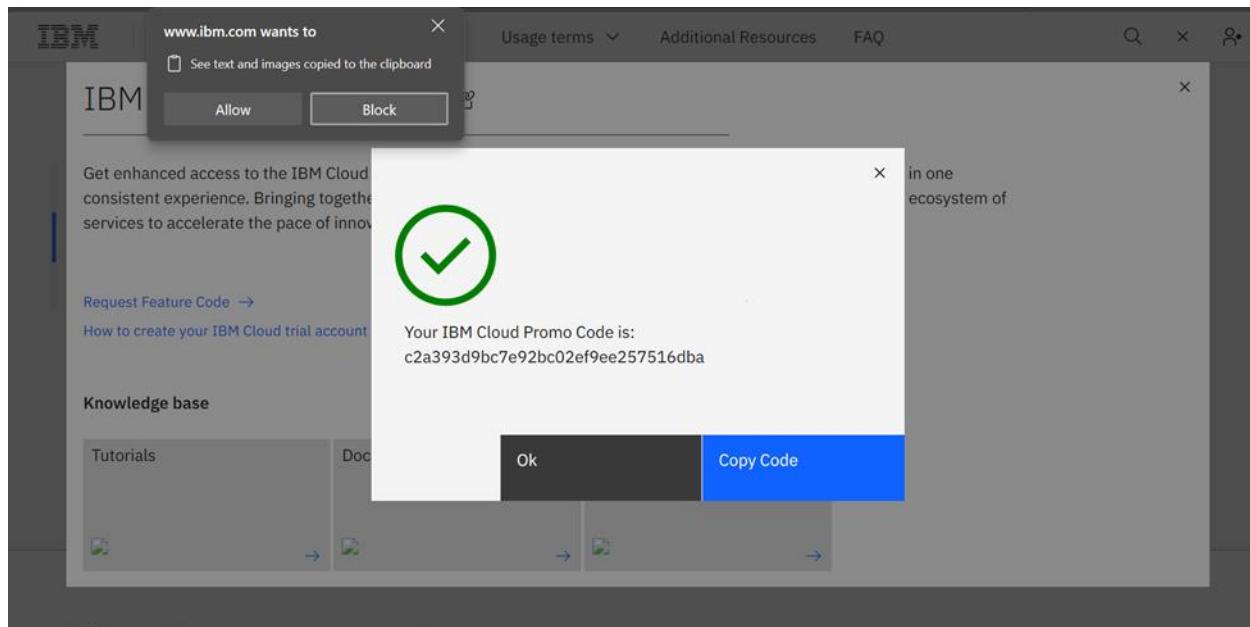
The screenshot shows the IBM Academic homepage at <https://www.ibm.com/academic/topic/cloud>. The 'Software' section is expanded, and the 'IBM Cloud Feature Code' item is highlighted with a green arrow. The sidebar on the left lists 'Courseware', 'Software' (which is selected), and 'Resources'. The main content area displays two cards: 'IBM Cloud Feature Code' and 'OpenLiberty'. The 'IBM Cloud Feature Code' card includes a description: 'Get enhanced access to the IBM Cloud the cloud platform that offers a choice of scalable and flexible resources in one consistent experience. Bringing'.

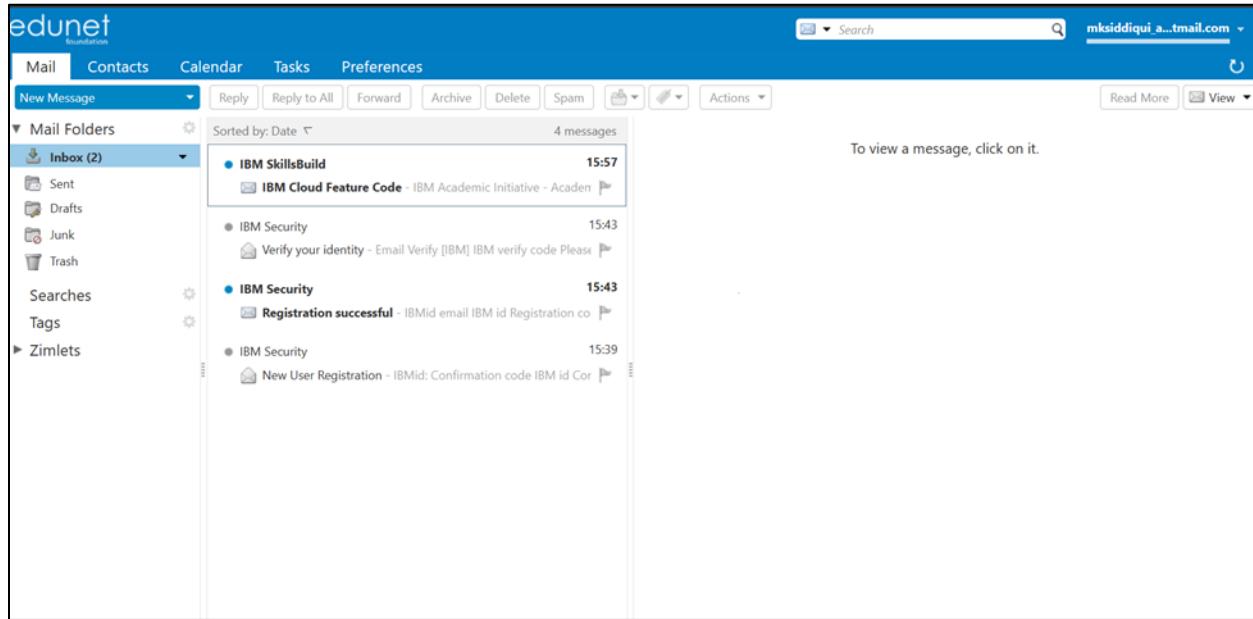
18. You would be redirected to a modal.



19. REQUEST A FEATURE CODE.

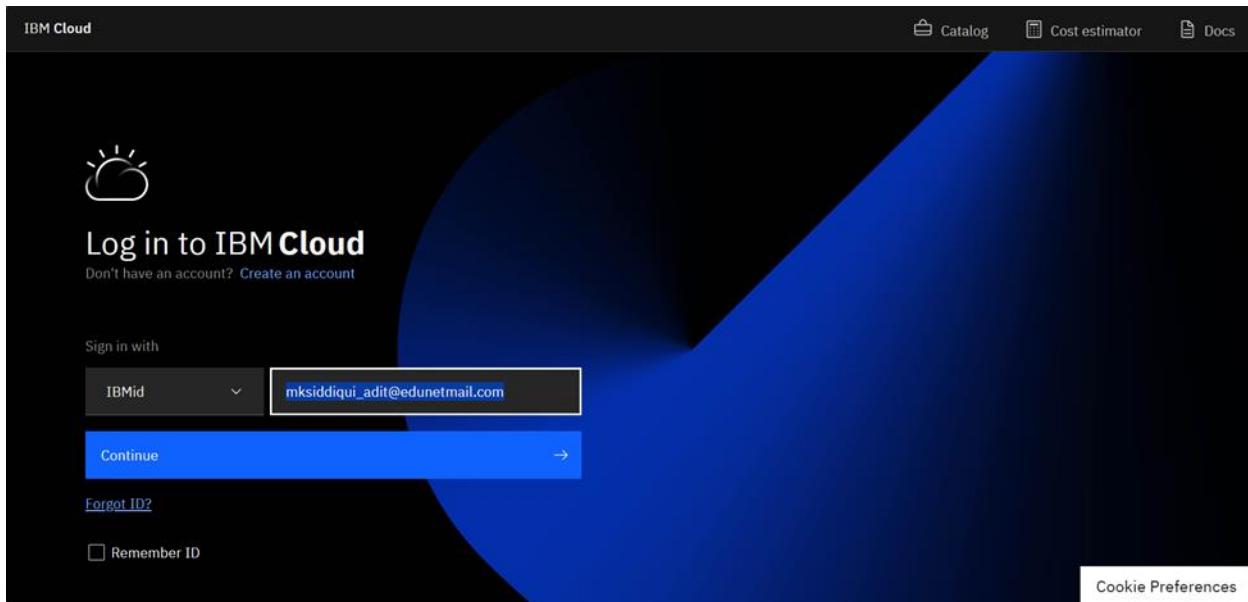
20. It provides you with a feature code, right here & into your mailbox.





21. Copy the FEATURE CODE,

22. Now go to [cloud.ibm.com](https://cloud.ibm.com)



23. You would need to register, by CREATE AN ACCOUNT

IBM Cloud

Create an IBM Cloud account

Already have an IBM Cloud account? [Log in](#)

Account information

Email:

Password:

[Next](#)

Verify email

**Get started for free**

No fees or upfront commitments, cancel anytime.

**Begin with USD 200 Cloud Credit**

Try any IBM Cloud product with this credit, available for 30 days.

**Explore always-free products**

Including IBM Watson® APIs. They never expire and you can't be charged for them—ever.

Cookie Preferences

24. Fill in the details, and the code sent to your mailbox & continue

IBM Cloud

Create an IBM Cloud account

Already have an IBM Cloud account? [Log in](#)

Account information

Email: mksiddiqui\_adit@edunetmail.com

Looks like you are using an IBMid! We will use your IBMid credentials to create this account.

[Next](#)

Verify email

**Get started for free**

No fees or upfront commitments, cancel anytime.

**Begin with USD 200 Cloud Credit**

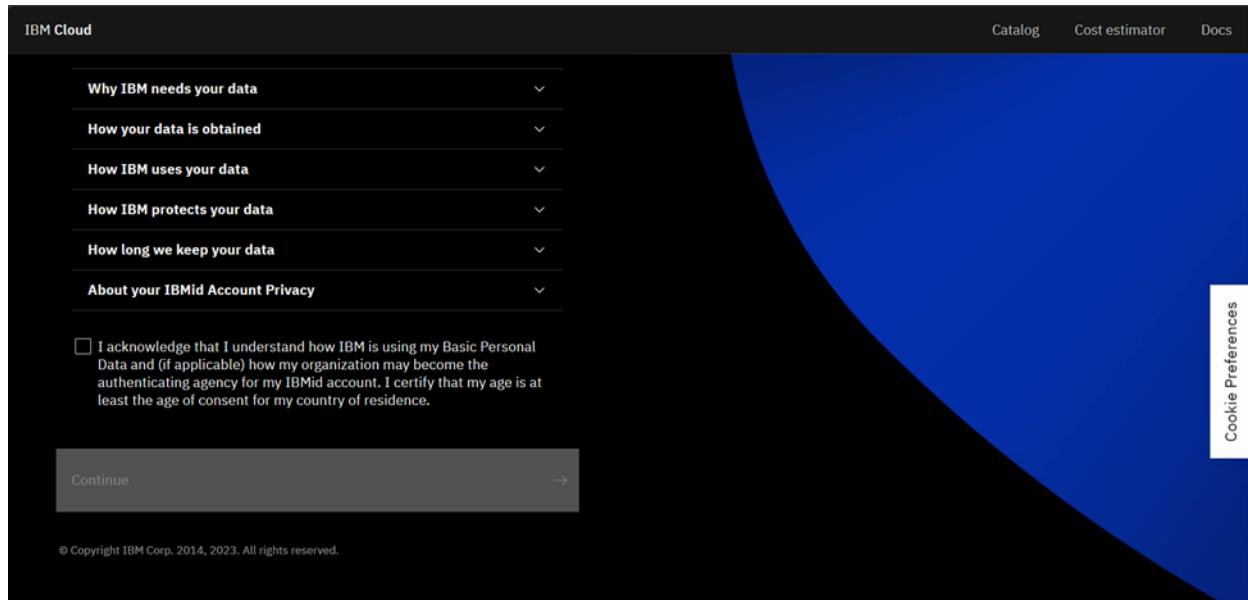
Try any IBM Cloud product with this credit, available for 30 days.

**Explore always-free products**

Including IBM Watson® APIs. They never expire and you can't be charged for them—ever.

Cookie Preferences

## 25. Acknowledge & continue



IBM Cloud

Catalog Cost estimator Docs

Why IBM needs your data

How your data is obtained

How IBM uses your data

How IBM protects your data

How long we keep your data

About your IBMid Account Privacy

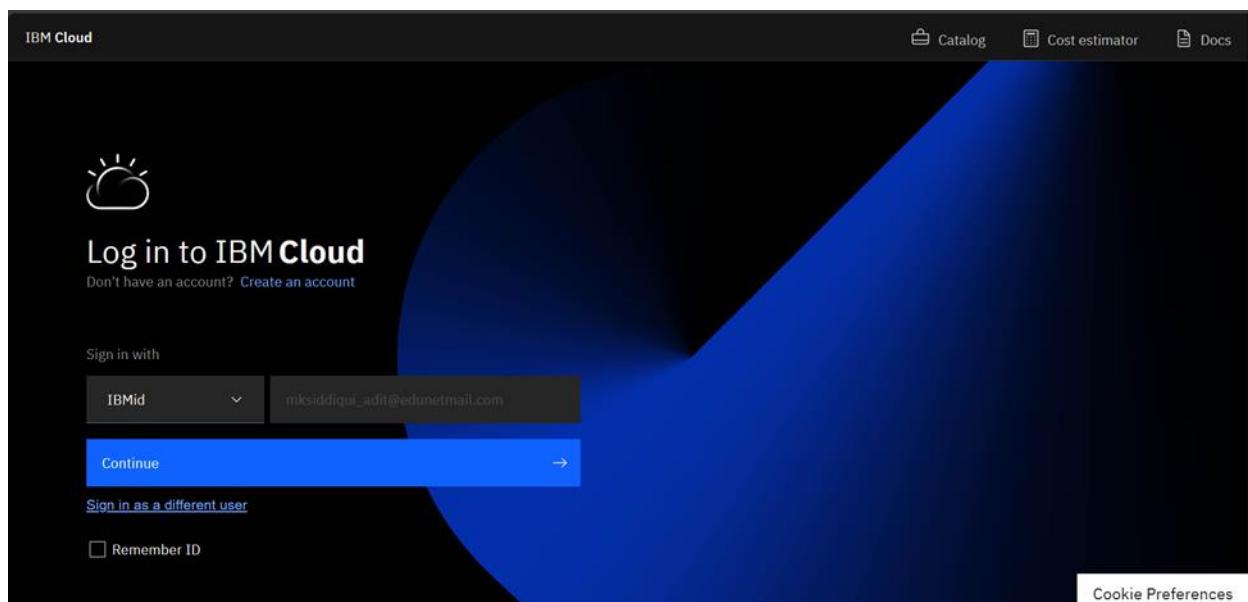
I acknowledge that I understand how IBM is using my Basic Personal Data and (if applicable) how my organization may become the authenticating agency for my IBMid account. I certify that my age is at least the age of consent for my country of residence.

Continue →

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Cookie Preferences

## 26. Now it will ask you to login



IBM Cloud

Catalog Cost estimator Docs

Log in to IBM Cloud

Don't have an account? [Create an account](#)

Sign in with

IBMid

mksiddiqui\_adit@edunetmail.com

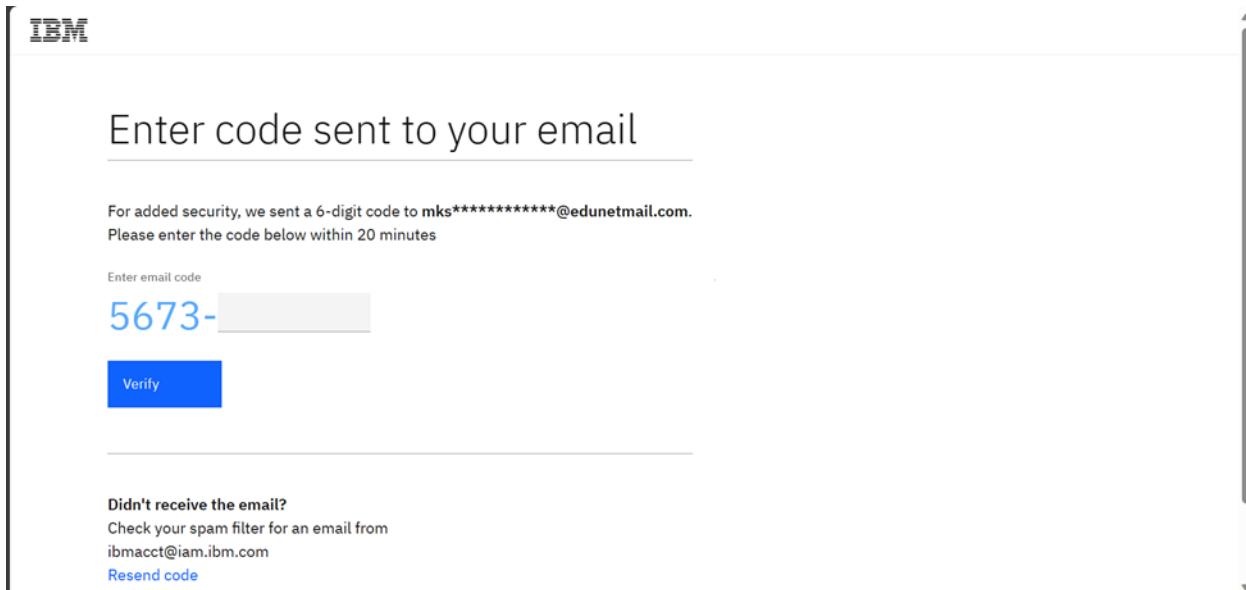
Continue →

[Sign in as a different user](#)

Remember ID

Cookie Preferences

27. Fill in your password & it will verify. Prompting you to fill in another code from your mailbox



Enter code sent to your email

For added security, we sent a 6-digit code to mks\*\*\*\*\*@edunetmail.com.  
Please enter the code below within 20 minutes

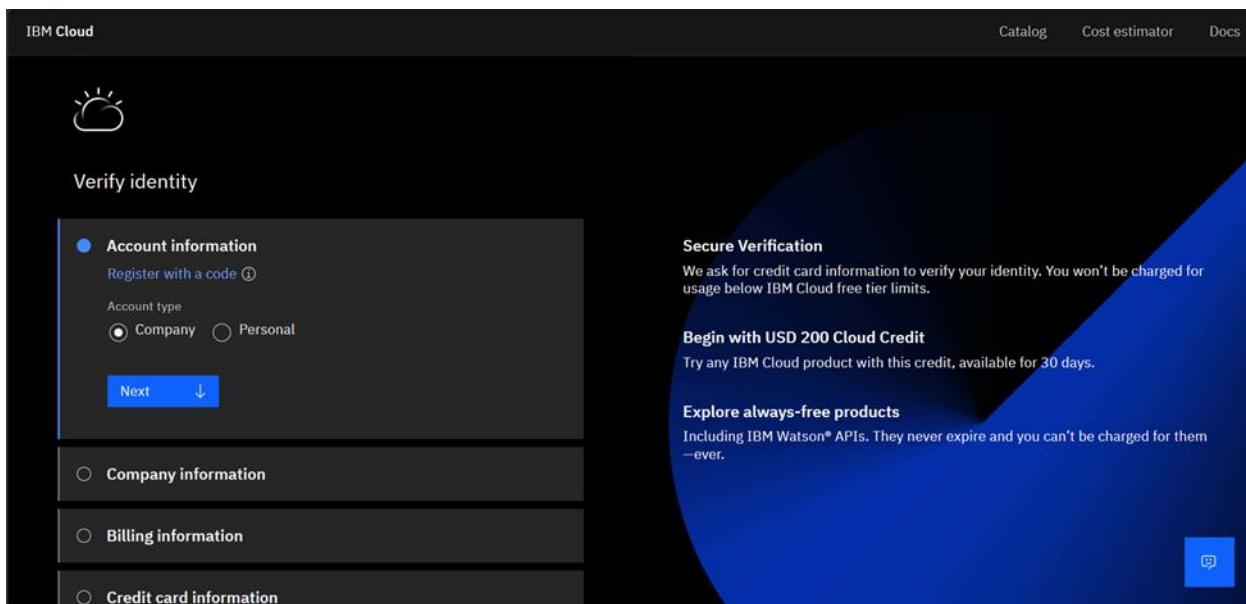
Enter email code

5673-

Verify

Didn't receive the email?  
Check your spam filter for an email from  
ibmacct@iam.ibm.com  
Resend code

28. It will navigate back to account information



IBM Cloud

Catalog Cost estimator Docs

Verify identity

Account information

Register with a code ⓘ

Account type

Company  Personal

Next

Company information

Billing information

Credit card information

Secure Verification

We ask for credit card information to verify your identity. You won't be charged for usage below IBM Cloud free tier limits.

Begin with USD 200 Cloud Credit

Try any IBM Cloud product with this credit, available for 30 days.

Explore always-free products

Including IBM Watson® APIs. They never expire and you can't be charged for them—ever.

## 29. Select REGISTER WITH A CODE. This is the same code, you generated with FEATURE

Verify identity

**Apply code** [Register without a code](#)

Enter the code that has been provided to you. You can apply the code to only one account, and it can't be removed.

Enter code

c2a393d9bc7e92bc02ef9ee257516db

Account ID: 924edcd0a63545a28f24bf76cfbeb1be

**Create account**

Secure Verification  
We ask for credit card information to verify your identity. You won't be charged for usage below IBM Cloud free tier limits.

**Begin with USD 200 Cloud Credit**  
Try any IBM Cloud product with this credit, available for 30 days.

**Explore always-free products**  
Including IBM Watson® APIs. They never expire and you can't be charged for them—ever.

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## 30. Fill in the code & CREATE ACCOUNT

Verify identity

**Apply code** [Register without a code](#)

Enter the code that has been provided to you. You can apply the code to only one account, and it can't be removed.

Enter code

c2a393d9bc7e92bc02ef9ee257516db

Account ID: 924edcd0a63545a28f24bf76cfbeb1be

**Processing your information...**

Secure Verification  
We ask for credit card information to verify your identity. You won't be charged for usage below IBM Cloud free tier limits.

**Begin with USD 200 Cloud Credit**  
Try any IBM Cloud product with this credit, available for 30 days.

**Explore always-free products**  
Including IBM Watson® APIs. They never expire and you can't be charged for them—ever.

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### 31. You might fill in a few details

The screenshot shows the IBM Cloud Dashboard with a prominent modal window titled "Welcome! Tell us about yourself." The modal asks three questions with dropdown menus: "What are you most interested in?", "What is your job role?", and "What is your industry?". Below the modal, there are two buttons: "Skip this step" and "Let's get started!". The dashboard background features a dark theme with a central graphic of a person interacting with clouds and a screen.

### 32. And your account is created. Congratulations!

#### Output/Results snippet:

After being successful log in, the IBM Cloud Dashboard looks like as follows:

The screenshot shows the IBM Cloud Dashboard after logging in. The top navigation bar includes "IBM Cloud", "Search resources and products...", "Catalog", "Manage", and a user profile for "Mohammad Kashif Sid...". A sidebar on the left contains icons for various services like Compute, Storage, and Database. The main area has a "For you" section with tiles for "Build", "Db2", "Build with Watson", "Explore IBM Cloud Shell", and "Get Started with Watson Studio". Below this, a "Get started options recommended for you" section provides links to "News" and "Planned maintenance". The bottom of the screen shows a footer with "View all" and "Next" buttons.

## Activity 2

**Aim:** Understanding IBM db2. Creating a database & running SQL query on IBM db2.

**Learning Outcome:** Able to understand IBM db2 and the CRUD operations.

**Duration:** 3 hours

### List of Hardware/Software requirements:

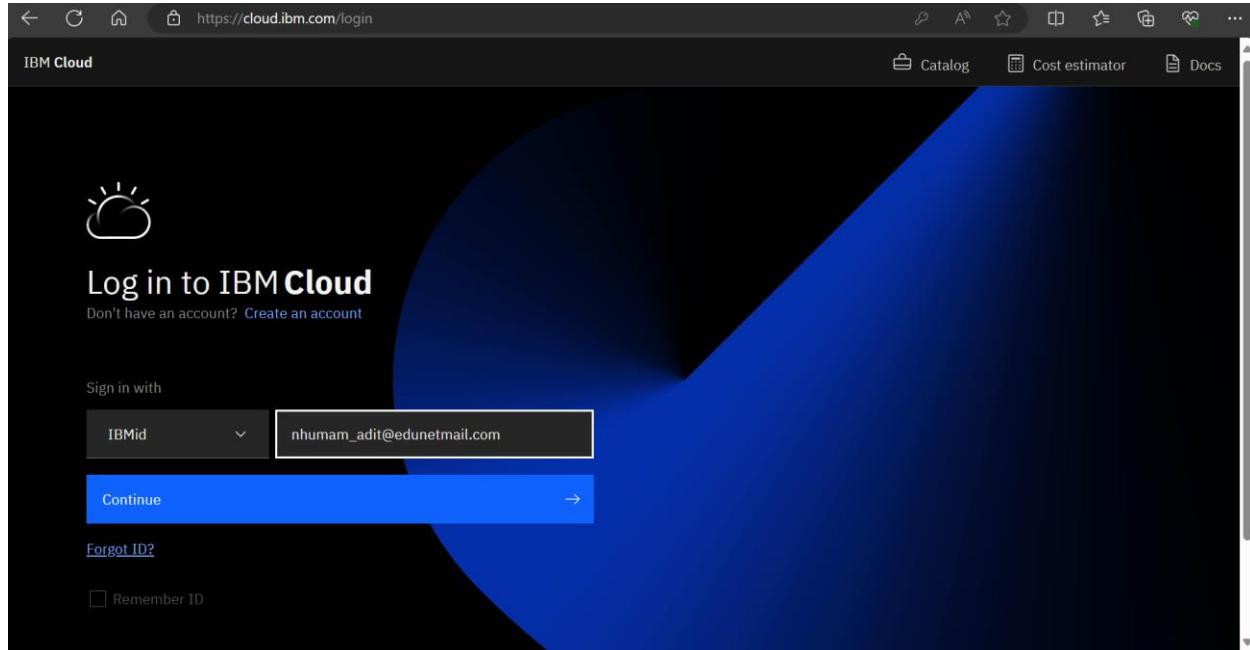
1. OS: Windows 10/11, or MacOS, or Linux distributions.
2. Web Browser: Microsoft Edge, Google Chrome, Mozilla Firefox, Brave or any compatible browser.
3. IBM Cloud Account

### Code/Program/Procedure (with comments):

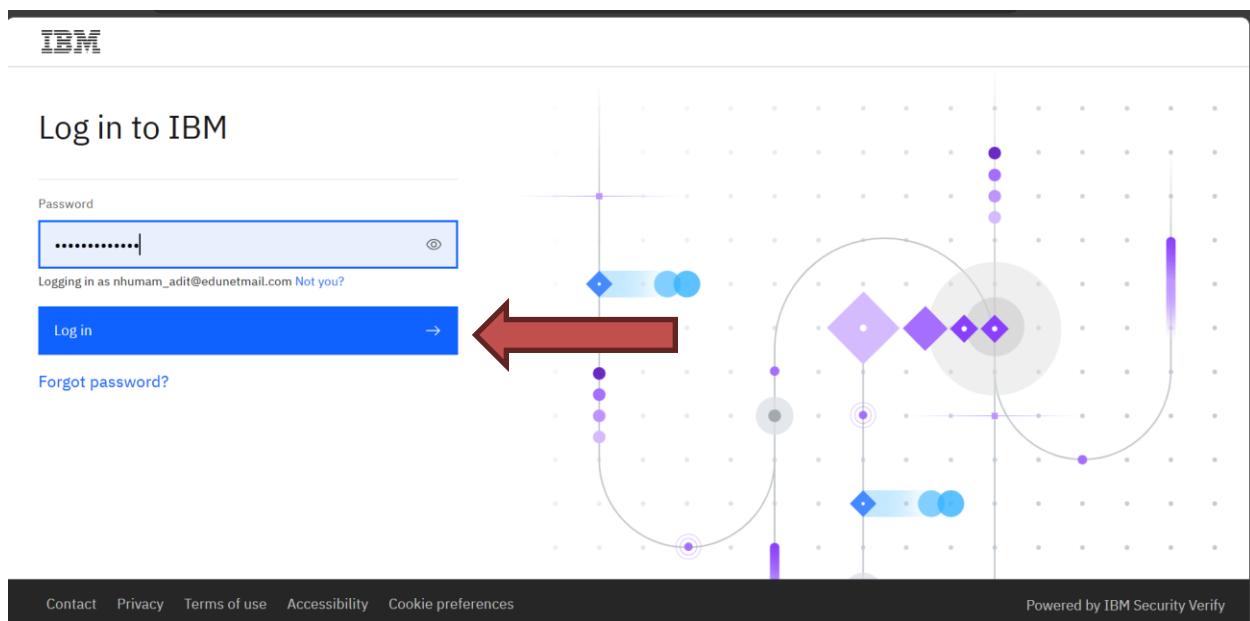
What is IBM Db2?

IBM® Db2® is the [cloud-native](#) database built to power low-latency transactions and real-time analytics at scale. It provides a single engine for DBAs, enterprise architects and developers to keep critical applications running, store and query anything, and power faster decision-making and innovation across your organization. Built on decades of innovation in data security, scalability and availability, you can use Db2 to keep your applications and analytics protected, highly performant and resilient, anywhere.

Step 1: Open [IBM Cloud](#) in your browser.



Step 2: Fill in you ID & Password as per the prompt and click login



Step 3: You would be redirected to your dashboard

The screenshot shows the IBM Cloud dashboard. At the top, there's a navigation bar with 'IBM Cloud' on the left, a search icon, 'Catalog', 'Manage', and 'Nashit Humam's Account'. On the right are icons for help, dashboard, account, notifications, and user profile. Below the navigation is a header with 'Dashboard' and a dropdown arrow, followed by 'Edit dashboard', 'Upgrade account', and a 'Create resource' button. A sidebar on the left contains icons for various services like Cloud Foundry, Watson, Blockchain, and Container Registry. The main area has a 'For you' section with cards for 'Build', 'Explore offerings', 'Visit the IBM Cloud catalog', 'Build cloud-native apps using IBM Cloud Object Storage', and 'Browse, select, and create a database'. Below this is a news section with 'News' and 'View all' buttons, and a 'Planned maintenance' section.

Step 4: Click on Catalog, to navigate to different resources available.

This screenshot is identical to the one above, showing the IBM Cloud dashboard. However, a large red arrow points specifically to the 'Catalog' tab in the top navigation bar, indicating where the user should click to proceed.

Step 5: This brings you the list of various resources available. You might go for databases or search for db2 from the catalog search

The screenshot shows the IBM Cloud Catalog interface. At the top, there's a navigation bar with 'IBM Cloud' and various account-related icons. Below it is a search bar labeled 'Search the catalog...'. A red arrow points from the text 'Step 5: Search for db2' down to the search bar. The main area is titled 'Catalog' and shows 'Viewing 223 products'. On the left, there's a sidebar with a 'Category' section containing links like 'Compute (35)', 'Containers (11)', 'Networking (30)', 'Storage (23)', and 'Converged infrastructure (3)'. To the right, there are two product cards: 'Power Virtual Server with VPC landing zone' and 'Cloud Object Storage on VPC for SAP HANA Backup'. Both cards have a 'Deployable architecture' badge.

This screenshot shows the same IBM Cloud Catalog interface as above, but with a longer list of categories in the sidebar. A red arrow points from the text 'Step 6: This lists all the database type available on IBM Cloud. Slide down a little to navigate to db2. And open it.' down to the 'Databases (21)' link. The 'Databases' link is highlighted with a red rectangle. Below it, other categories listed include 'Developer tools (18)' and 'Logging and monitoring (3)'. The main product cards for 'Power Virtual Server with VPC landing zone' and 'Cloud Object Storage on VPC for SAP HANA Backup' are still visible on the right.

Step 6: This lists all the database type available on IBM Cloud. Slide down a little to navigate to db2. And open it.

**Databases**

Type: All

Delivery method: Helm charts, OVA Images

DataStage  
By IBM  
Create ETL and data pipeline services for real-time, micro-batch, and batch data orchestration.  
Lite • Free • IAM-enabled • IBM supported

Cloudant  
By IBM  
A scalable JSON document database for web, mobile, IoT, and serverless applications.  
Lite • Free • EU Supported • IAM-enabled • IBM supported

IBM Cloud catalog

Region: Dallas, Frankfurt, London, Madrid, Milan

Release: Show more, Deprecated

Support: IBM supported, Third party supported

<https://cloud.ibm.com/catalog/services/db2>

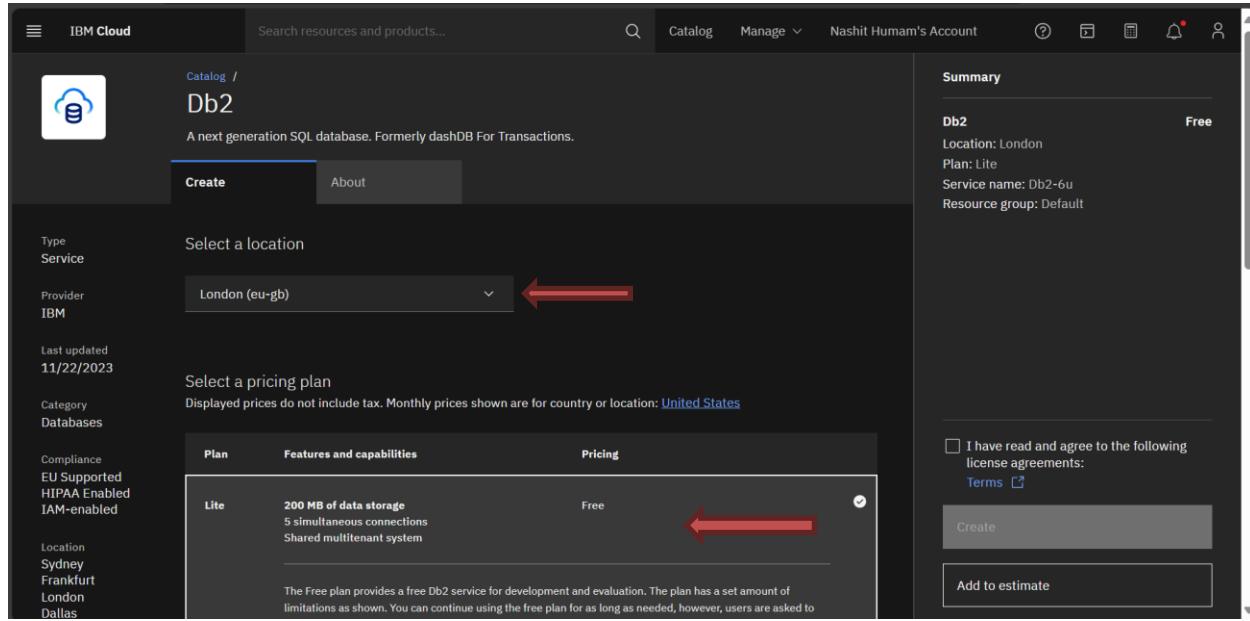
**Data Engine (previously SQL Query)**  
By IBM  
Read, analyze, store and stream data in Cloud Object Storage with ANSI SQL. Manage table metadata in a Hive metastore compatible catalog.  
Lite • Free • IAM-enabled • IBM supported

**Db2**  
By IBM  
A next generation SQL database. Formerly dashDB For Transactions.  
Lite • Free • EU Supported • HIPAA Enabled • IAM-enabled • IBM supported

**Db2 Warehouse**  
By IBM  
Deploy and manage a MongoDB cluster to protect your

**Hyper Protect DBaaS for MongoDB**  
By IBM

Step 7: You are now on CREATE RESOURCE page. Make sure you have selected LONDON as your region & Free Tier selected.



Step 8: Slide a little for options to configure your resource. And CREATE.

- You might rename your SERVICE NAME, to something relevant like (adit, nsti) so that you might recognize when you are working on a project, with several number of instances.
- SELECT A RESOURCE GROUP: you might add a RESOURCE GROUP, to easily handle and navigate between projects. For free tier we have a DEFAULT RESOURCE GROUP only.
- TAGS: To identify the phase and version , you might define the tags. It is optional, you might leave it blank. But, it is suggested to configure it to let the team understand the phase the project is in. configuration needs to be in key:value or a term pair like;

*env:code; env:prod; env:test; env:deploy; ver:1; ver:2 etc*

- ACCESS MANAGEMENT TAGS: Optional. But you might configure to help yourself apply flexible access policies on specific resources. Configuration needs to be in key:value pair like;

*env:prod; env:client; env:team; version:1 etc*

- EMAIL: For updates on the current resource you are creating. IBM team might reach you regarding the product, connections, bills etc. You might leave it blank.

Configure your resource

Service name: Db2-6u

Select a resource group: Default

Tags: Examples: env:dev, version-1

Access management tags: Examples: access:dev, proj:version-1

Email: email@example.com

I have read and agree to the following license agreements: [Terms](#)

**Summary**

**Db2** Location: London Plan: Lite Service name: Db2-6u Resource group: Default

Configure your resource

Service name: Db2-6u

Select a resource group: Default

Tags: env:prod, version:1, first

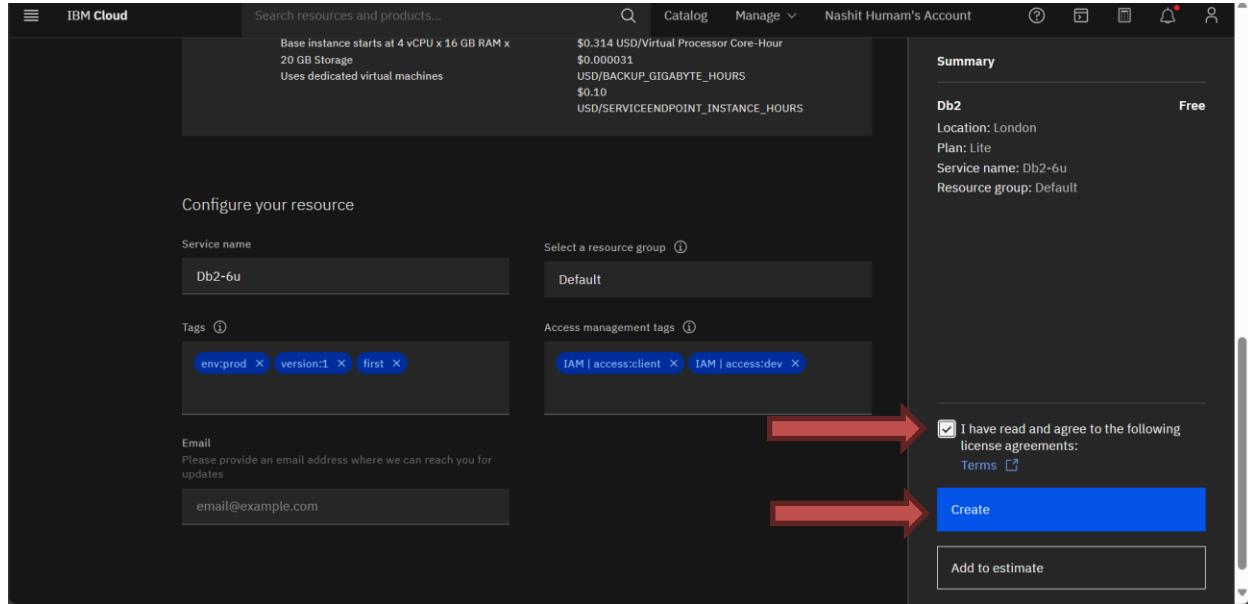
Access management tags: IAM | access:client, IAM | access:dev

Email: email@example.com

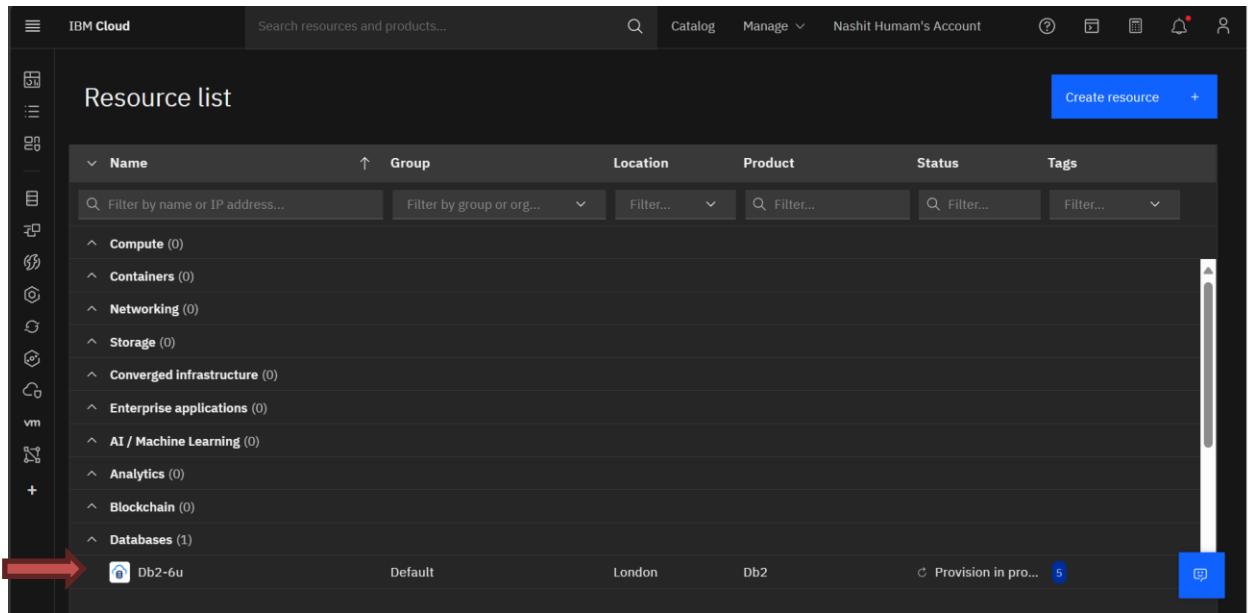
I have read and agree to the following license agreements: [Terms](#)

**Summary**

**Db2** Location: London Plan: Lite Service name: Db2-6u Resource group: Default



Step 9: It redirects you to RESOURCES page, where you can find the resource, you just created which will take a few minutes of provisioning. Once provisioned, open the resource, you created.



Step 10: You are redirected to the RESOURCE page, and from here navigate to the UI, by clicking on “GO TO UI”, to be redirected to an OVERVIEW page

IBM Cloud

Resource list / Db2-6u Active env:prod first version:1 +2 ↗

Manage Getting started Service credentials Connections

Getting started

Where can I find my credentials? Get your username and password by clicking the "Service Credentials" link to the left and selecting "New Credentials". Don't see this menu on the left? Click on "Manage in IBM Cloud" to open the IBM Cloud dashboard.

Go to UI Getting started docs

Need help? Submit a IBM Cloud Support Case to our team.

Support case

## Step 11: Navigate to SQL

IBM Db2 on Cloud

Overview In-flight executions Connections Table performance

SQL

Resource usage

Last 1 hour

Storage (0M / 0M)  
0% current value

Storage 0%  
Dec 6, 11:21 AM - 11:26 AM

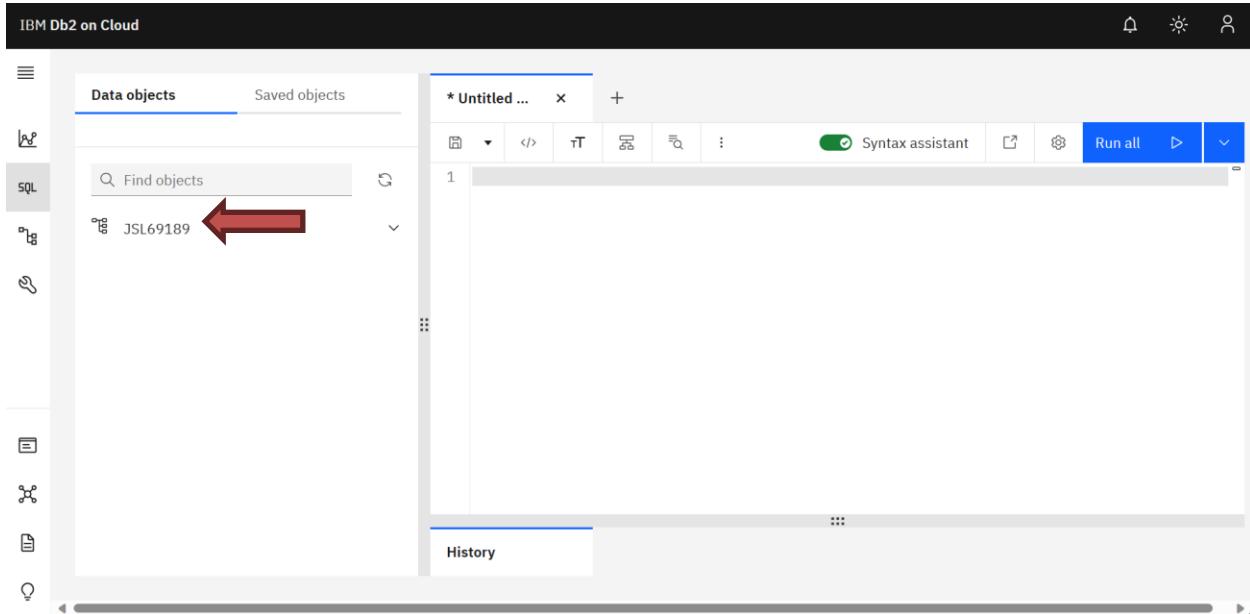
Storage usage (%)

100  
80  
60  
40  
20  
0

10:25 AM 10:40 AM 11:00 AM 11:20 AM 11:26 AM

Time

Step 12: Now, you have a SQL Query editor with you. And you have a DATABASE/SCHEMA with the following name. You might run your queries, right away to create tables, and do all the CRUD operations.



Step 13: Run your query to create TABLES, like

```
create table students(id int, name varchar(35), mail varchar(20), phone int);
```

and run it, to create a table.

The screenshot shows the IBM Db2 on Cloud interface. On the left, there's a sidebar with icons for Data objects, Saved objects, Find objects, and a user profile. The main area has a title bar 'IBM Db2 on Cloud'. Below it is a 'Data objects' tab and a 'Saved objects' tab. A search bar says 'Find objects' and shows a result 'JSL69189'. To the right is a SQL editor window titled '\* Untitled ...' containing the following code:

```
1 create table students(id int, name varchar(35), mail varchar(20), phone int);
```

The editor has a toolbar with various icons and a 'Run all' button highlighted with a red arrow. Below the editor is a 'History' section showing the execution of the same SQL statement.

Step 14: You will find the table thus created by expanding the SCHEMA, and TABLE;

This screenshot shows the same IBM Db2 on Cloud interface as above, but with a different view of the sidebar. The 'Data objects' tab is selected, and the sidebar now shows a tree structure under 'Tables':

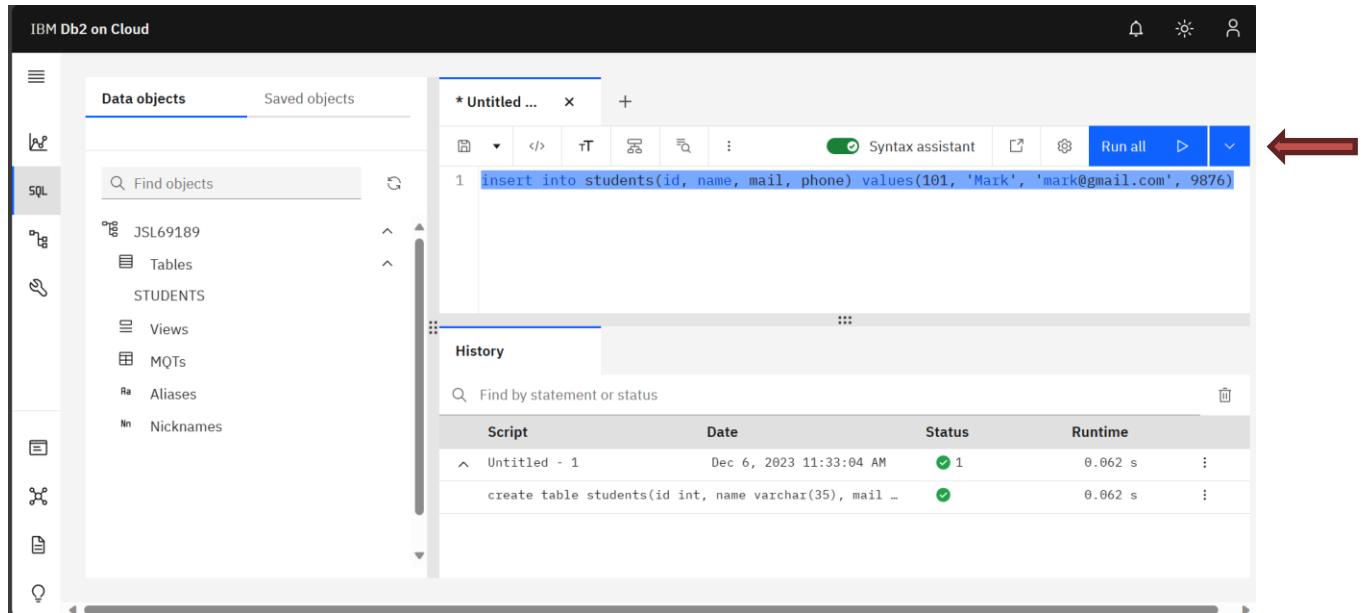
- Tables (selected)
- STUDENTS (highlighted with a red arrow)
- Views
- MQTs
- Aliases
- Nicknames

The main SQL editor window remains the same, showing the 'create table' statement and its history.

Step 15: Now insert data by running your query

*insert into students(id, name, mail, phone) values(101, 'Mark', 'mark@gmail.com', 9876)*

and run it. Your data is thus inserted.



The screenshot shows the IBM Db2 on Cloud interface. On the left, there's a sidebar with icons for Data objects, Saved objects, SQL, Tables, Views, MQTs, Aliases, and Nicknames. The SQL tab is selected. In the center, there's an SQL editor window titled '\* Untitled ...'. The code input field contains:

```
1 insert into students(id, name, mail, phone) values(101, 'Mark', 'mark@gmail.com', 9876)
```

Below the editor is a history panel with a table:

Script	Date	Status	Runtime
Untitled - 1	Dec 6, 2023 11:33:04 AM	✓ 1	0.062 s
create table students(id int, name varchar(35), mail ...		✓	0.062 s

A red arrow points to the 'Run all' button in the top right corner of the editor window.

Step 16: You might insert more data similarly. And check the data thus inserted, by using the select query.

```
select * from students;
```

You might add some considerations, like only name or some conditions as our SQL.

IBM Db2 on Cloud

```

1 insert into students(id, name, mail, phone) values(102, 'Peter', 'peter@gmail.com', 987)
2 insert into students(id, name, mail, phone) values(103, 'John', 'john@gmail.com', 9874)

```

History

Script	Date	Status	Runtime
Untitled - 1	Dec 6, 2023 11:40:07 AM	✓ 1	0.007 s
insert into students(id, name, mail, phone) values(10...		✓	0.007 s
Untitled - 1	Dec 6, 2023 11:33:04 AM	✓ 1	0.062 s
create table students(id int, name varchar(35), mail ...		✓	0.062 s

IBM Db2 on Cloud

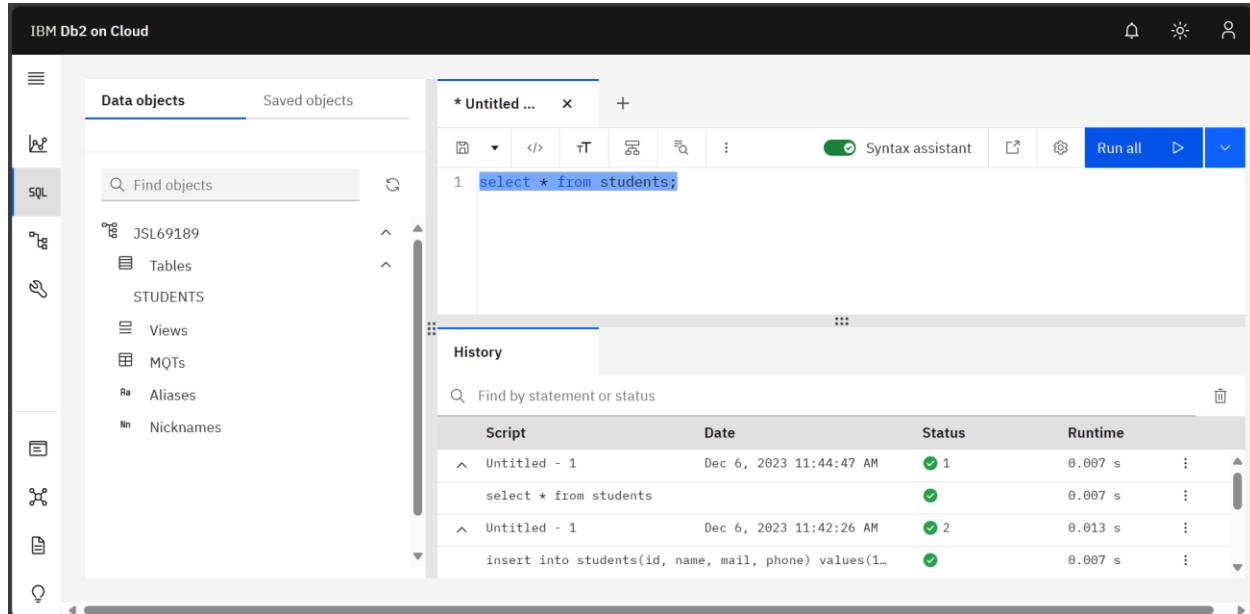
```

1 insert into students(id, name, mail, phone) values(102, 'Peter', 'peter@gmail.com', 987)
2 insert into students(id, name, mail, phone) values(103, 'John', 'john@gmail.com', 9874)

```

History

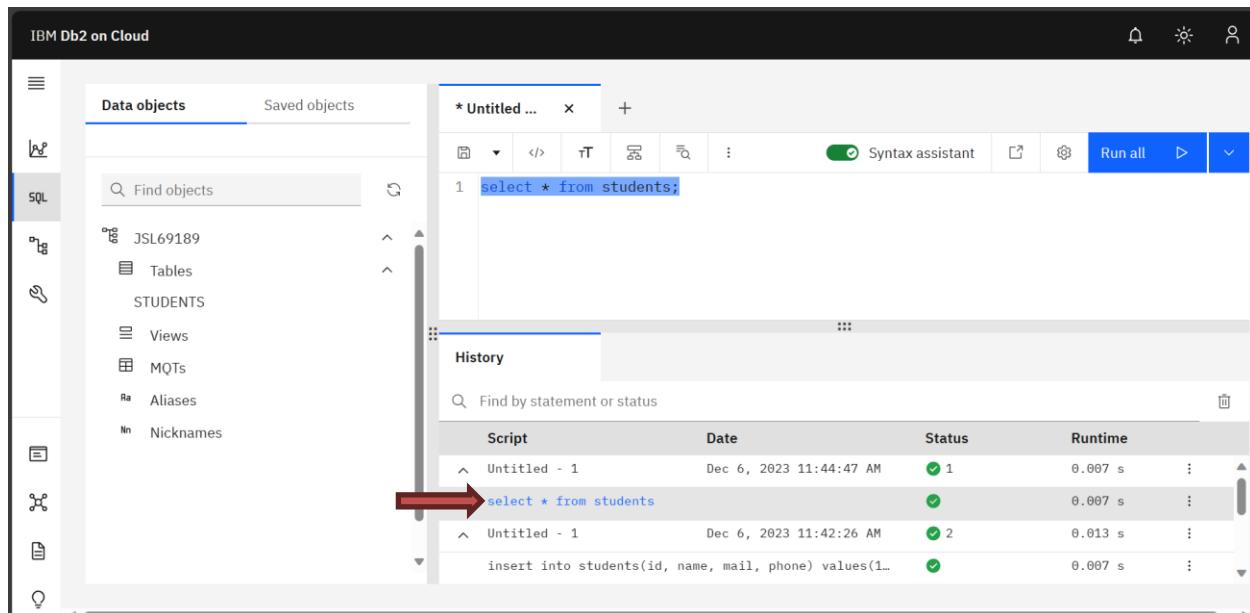
Script	Date	Status	Runtime
Untitled - 1	Dec 6, 2023 11:42:26 AM	✓ 2	0.013 s
insert into students(id, name, mail, phone) values(1...		✓	0.007 s
insert into students(id, name, mail, phone) values(1...		✓	0.006 s
Untitled - 1	Dec 6, 2023 11:40:07 AM	✓ 1	0.007 s



The screenshot shows the IBM Db2 on Cloud interface. On the left, there's a sidebar with 'Data objects' selected, showing a tree view with 'JSL69189' expanded, containing 'Tables' (with 'STUDENTS' selected), 'Views', 'MQTs', 'Aliases', and 'Nicknames'. The main area is a SQL editor titled '\* Untitled ...' with the query 'select \* from students;'. Below the editor is a 'History' section with a table:

Script	Date	Status	Runtime
Untitled - 1	Dec 6, 2023 11:44:47 AM	✓ 1	0.007 s
select * from students		✓	0.007 s
Untitled - 1	Dec 6, 2023 11:42:26 AM	✓ 2	0.013 s
insert into students(id, name, mail, phone) values(1...		✓	0.007 s

Check the Script, thus run to get the data;



This screenshot is identical to the one above, showing the IBM Db2 on Cloud interface. The red arrow points to the second row in the History table, specifically to the 'select \* from students;' query.

The screenshot shows the IBM Db2 on Cloud interface. On the left, there's a sidebar with icons for Data objects, Saved objects, Find objects, SQL, Tables (with STUDENTS selected), Views, MQTs, Aliases, and Nicknames. The main area has a toolbar with various icons and a syntax assistant toggle. A code editor window titled '\* Untitled ...' contains the query: 'select \* from students;'. Below it, a results table shows three rows of data:

ID	NAME	MAIL	PHONE
101	Mark	mark@gmail.com	9876
102	Peter	peter@gmail.com	9875
103	John	john@gmail.com	9874

Step 17: You can do Update aswell;

*update students set name = 'Mark Anthony' where id=101*

You can check the data using the select query

The screenshot shows the IBM Db2 on Cloud interface. The sidebar and toolbar are identical to the previous screenshot. The code editor window now contains the update query: 'update students set name = 'Mark Anthony' where id=101'. A red arrow points to the 'Run all' button in the toolbar. Below the code editor, a history table lists the executed statements:

Script	Date	Status	Runtime
Untitled - 1	Dec 6, 2023 11:51:53 AM	✓ 1	0.007 s
update students set name = 'Mark Anthony' where id=1...		✓	0.007 s
Untitled - 1	Dec 6, 2023 11:44:47 AM	✓ 1	0.007 s
select * from students		✓	0.007 s

The screenshot shows the IBM Db2 on Cloud interface. On the left, there's a sidebar with icons for Data objects, Saved objects, Find objects, SQL, Data objects (selected), Tables, Views, MQTs, Aliases, and Nicknames. The main area has a tab titled '\* Untitled ...' with a '+' button. Below it is a toolbar with icons for file operations, Syntax assistant (on), Run all, and a dropdown. A code editor window contains the SQL query: '1 select \* from students'. To the right is a results panel with tabs for History and Results. Under Result set 1, there's a table with columns ID, NAME, MAIL, and PHONE. The data shows three rows: 101 (Mark Anthony, mark@gmail.com, 9876), 102 (Peter, peter@gmail.com, 9875), and 103 (John, john@gmail.com, 9874). A total count of 3 is indicated.

Step 18: You might delete any record, and RUN it.

The screenshot shows the IBM Db2 on Cloud interface. The sidebar and main layout are identical to the previous screenshot. In the code editor window, the query '1 delete from students where id=103' is entered. The results panel shows the History tab with a table of executed statements. The table includes columns Script, Date, Status, and Runtime. It lists four entries: 'Untitled - 1' (Dec 6, 2023 12:02:51 PM, status 1, runtime 0.007 s), 'delete from students where id=103' (status 1, runtime 0.007 s), 'Untitled - 1' (Dec 6, 2023 11:56:11 AM, status 1, runtime 0.010 s), and 'select \* from students' (status 1, runtime 0.010 s).

Step 19: Check the data using select query. Record 103 is deleted.

IBM Db2 on Cloud

The screenshot shows the IBM Db2 on Cloud interface. On the left, there's a sidebar with icons for Data objects, Saved objects, Find objects, Tables (selected), Views, MQTs, Aliases, and Nicknames. The main area has a SQL editor window titled '\* Untitled ...' containing the query: 'select \* from students;'. Below the editor is a History panel showing previous queries and their execution details. The History table includes columns for Script, Date, Status, and Runtime.

Script	Date	Status	Runtime
Untitled - 1	Dec 6, 2023 12:04:07 PM	✓ 1	0.009 s
select * from students		✓	0.009 s
Untitled - 1	Dec 6, 2023 12:02:51 PM	✓ 1	0.007 s
delete from students where id=103		✓	0.007 s

IBM Db2 on Cloud

This screenshot shows the same IBM Db2 on Cloud interface as above, but the Results tab is selected in the History panel. It displays the results of the 'select \* from students;' query in a table format. The table has columns ID, NAME, MAIL, and PHONE. There are two rows: one for Mark Anthony and one for Peter.

ID	NAME	MAIL	PHONE
101	Mark Anthony	mark@gmail.com	9876
102	Peter	peter@gmail.com	9875

Step 20: Drop the table

IBM Db2 on Cloud

The screenshot shows the IBM Db2 on Cloud interface. On the left, there's a sidebar with icons for Data objects, Saved objects, Find objects, SQL, Data objects (selected), Tables, Views, MQTs, Aliases, and Nicknames. The main area has tabs for \*Untitled ... (selected), History, and Results. A code editor window contains the SQL command: `drop table students;`. Below the code editor is a history table:

Script	Date	Status	Runtime
Untitled - 1	Dec 6, 2023 12:06:48 PM	✓ 1	0.044 s
drop table students		✓	0.044 s
Untitled - 1	Dec 6, 2023 12:04:07 PM	✓ 1	0.009 s
select * from students		✓	0.009 s

IBM Db2 on Cloud

This screenshot is identical to the one above, showing the IBM Db2 on Cloud interface with the same sidebar, code editor containing `drop table students;`, and the same history table.

The TABLE is now dropped.

References: [IBM Db2](#)

## Activity 3

**Aim:** Create a chatbot using IBM Watson.

**Learning outcome:** Able to understand the Cloud, Architecture, App Development & Deployment in cloud environment.

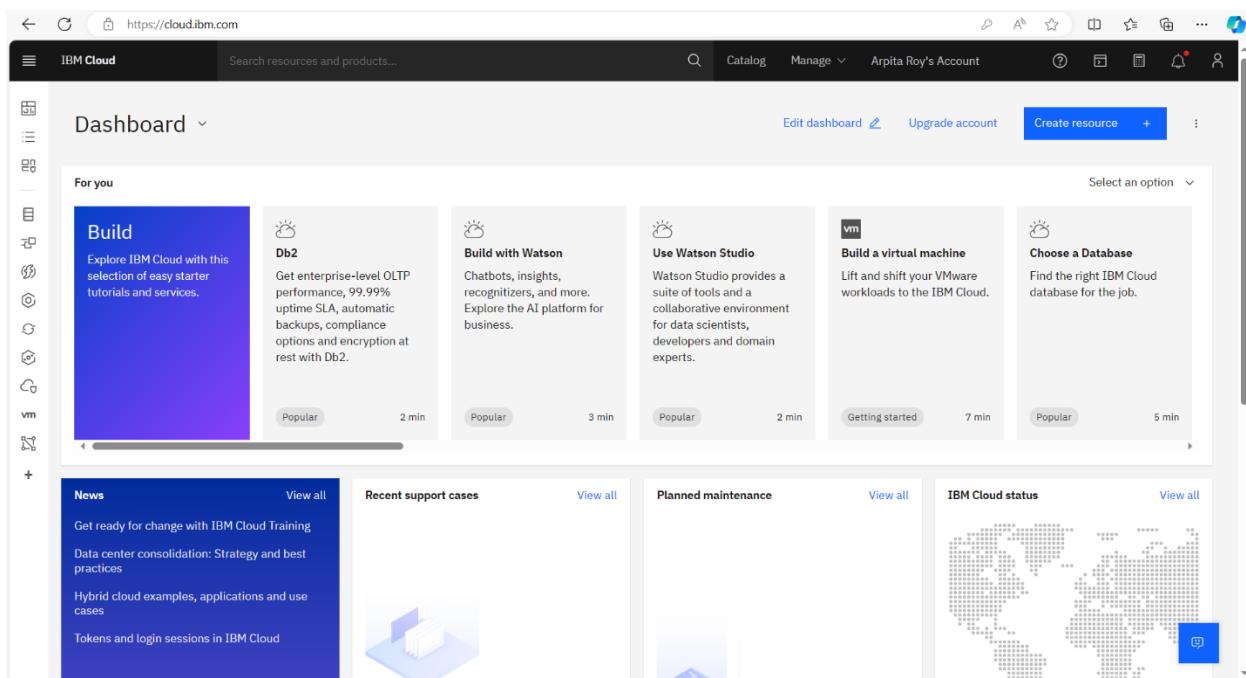
**Duration:** 2 hour

### List of Hardware/Software requirements:

3. Laptop / Desktop with windows 10
4. Internet

### Code/Program/Procedure (with comments):

1. Go to Catalog



The screenshot shows the IBM Cloud dashboard at <https://cloud.ibm.com>. The top navigation bar includes links for Catalog, Manage, and Arpita Roy's Account. The main area is titled "Dashboard". On the left, there's a sidebar with icons for various services like Build, Db2, Watson, Watson Studio, Virtual Machines, and Databases. The "For you" section features cards for "Build", "Db2", "Build with Watson", "Use Watson Studio", "Build a virtual machine", and "Choose a Database". Below this, there are sections for "News", "Recent support cases", "Planned maintenance", and "IBM Cloud status" (showing a world map). A search bar at the top is set to "Search resources and products...".

2. Search for **Watson Assistant**. Click on it.

The screenshot shows the IBM Cloud Catalog interface. The search bar at the top contains the query 'Watson Assistant'. Below the search bar, the results are displayed under the heading 'Search results for 'Watson Assistant'' with '2 results'. The first result is 'Watson Assistant' by IBM, which is highlighted with a blue arrow. This entry includes a brief description: 'Watson Assistant lets you build conversational interfaces into any application, device, or channel.' and indicates it is 'Lite • Free • IAM-enabled'. The second result is 'Tiny Tiny RSS' by Third party, which is described as an open source web-based news feed reader and aggregator.

3. Click on the **region drop down** to select a data center closer to you. For example, you might select London (eu-gb).

This will reduce latency and improve performance as you use Watson Assistant.

The screenshot shows the product page for Watson Assistant. At the top, there is a summary section with details like 'Location: London', 'Plan: Lite', and 'Service name: Watson Assistant-ju'. On the left, there is a sidebar with service type ('Type Service'), provider ('Provider IBM'), update date ('Updated on 07/19/2022'), category ('Category AI / Machine Learning'), compliance information ('Compliance EU Supported HIPAA Enabled IAM-enabled'), and location options ('Location Sydney, Frankurt, London, Tokyo, Washington DC, Dallas, Seoul'). The main content area shows the product details: 'Watson Assistant lets you build conversational interfaces into any application, device, or channel.' Below this are tabs for 'Create' and 'About'. A green arrow points to the 'Create' tab. Under 'Create', there is a 'Select a location' dropdown menu where 'London (eu-gb)' is selected. Further down, there is a 'Select a pricing plan' section with a note about tax and a link to United States prices. A table lists the 'Plan', 'Features', and 'Pricing' for the 'Lite' plan. At the bottom right, there is a checkbox for accepting license agreements and buttons for 'Create' and 'Add to estimate'.

4. Scroll down the page and change the **instance name** to your liking (e.g., Watson Assistant Flower Shop), as shown in the image. Click on the **Create** button to create your instance.

5. You will be redirected to the launch page for the service you just created. Click on the **Launch Watson Assistant** button to access the web application that will allow you to create chatbots.

Congratulations on creating your instance of Watson Assistant!

6. You will land into the page like the one shown below.
7. Provide the **Assistant name**. Click **Next**.

Welcome to watsonx Assistant

Create    Personalize    Customize    Preview

### Create your first assistant

Let's get your assistant up and running. Name your assistant, add a description, and choose a language. In following steps we'll gather more information, show you basic customizations, and give you a preview of what your assistant will look like.

Assistant name  
Nsti Bot

Your assistant name will be kept internally and not visible to your customers

Description (optional)  
Add a description for this assistant

Assistant language  
English (US)

This is the language your assistant will speak.

## 8. Personalize your assistant with the details shown in the image. Click **Next**.

Welcome to watsonx Assistant

Create    Personalize    Customize    Preview

### Personalize your assistant

**Tell us where your assistant will live**  
You may add multiple channels from your dashboard.

Where do you plan on deploying your assistant?  
 Web

**Tell us about yourself**  
This information will be used to personalize your onboarding experience.

Which industry do you work in?  
 N/A (I am a student)

What is your role on the team building the assistant?  
 Developer

Which statement describes your needs best?  
 I want to automate common tasks in a natural way

This is what your customers will experience

watsonx Assistant

Do you have the Speed Demons in stock?

The Speed Demons are in stock at our Downtown and Northgate locations, which are both within 5 miles of you.

What size and color do you need?

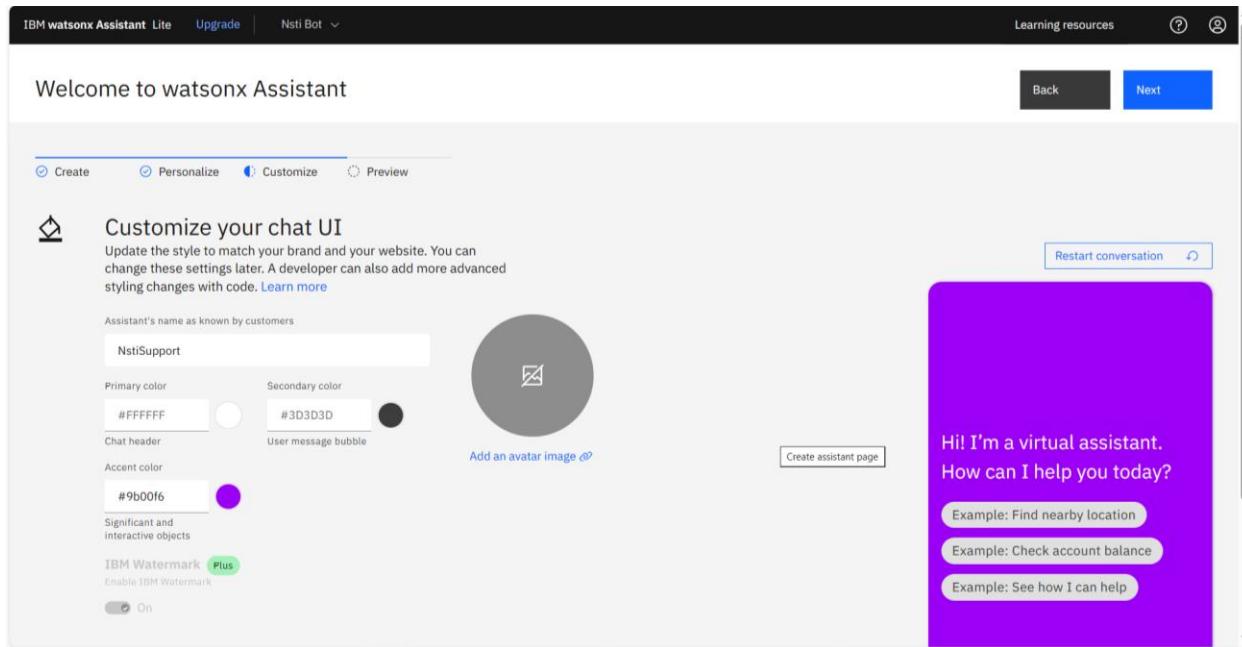
I'm looking for a size 9 in white

Great news! The Speed Demons are available in white in a size 9.

You can purchase them for curbside pickup or we can ship them to you. Which would you prefer?

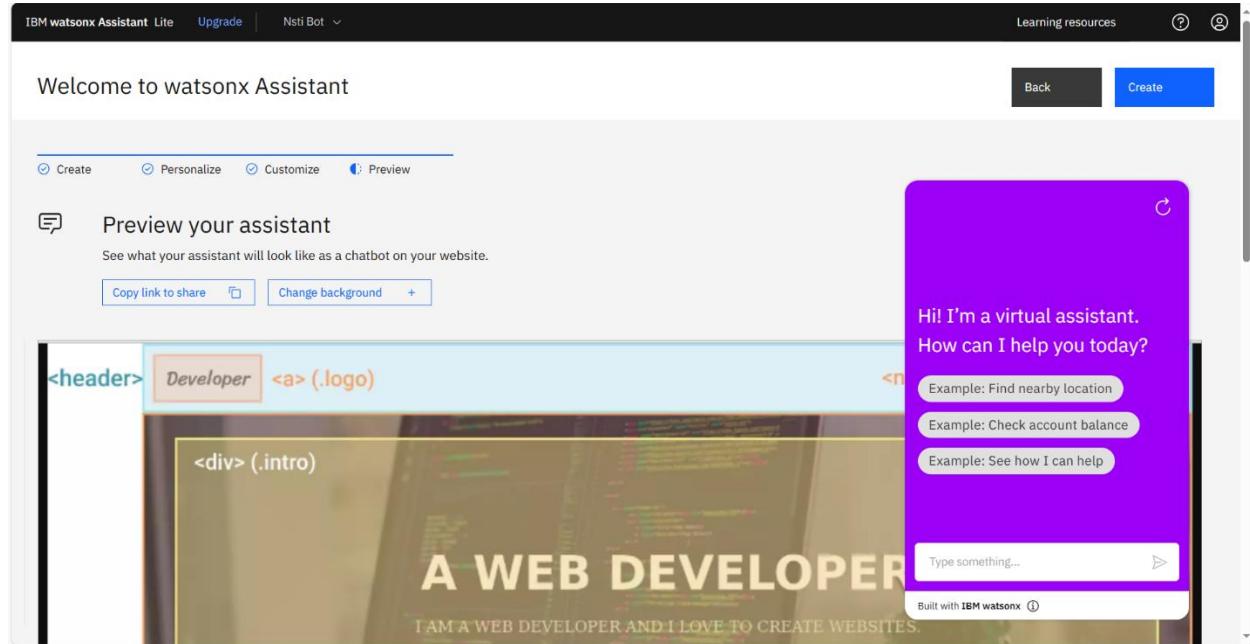
I'll pick them up   Ship them to me!

9. Customize your chat UI by providing a Assistant's name (like AskDISHA for IRCTC website).



### **Output/Results snippet:**

10. Preview your Assistant.



## Activity 4

**Aim:** Create an object storage instance in IBM cloud.

**Learning Outcome:** Able to understand Cloud, Architecture, App Development and Deployment in cloud environment.

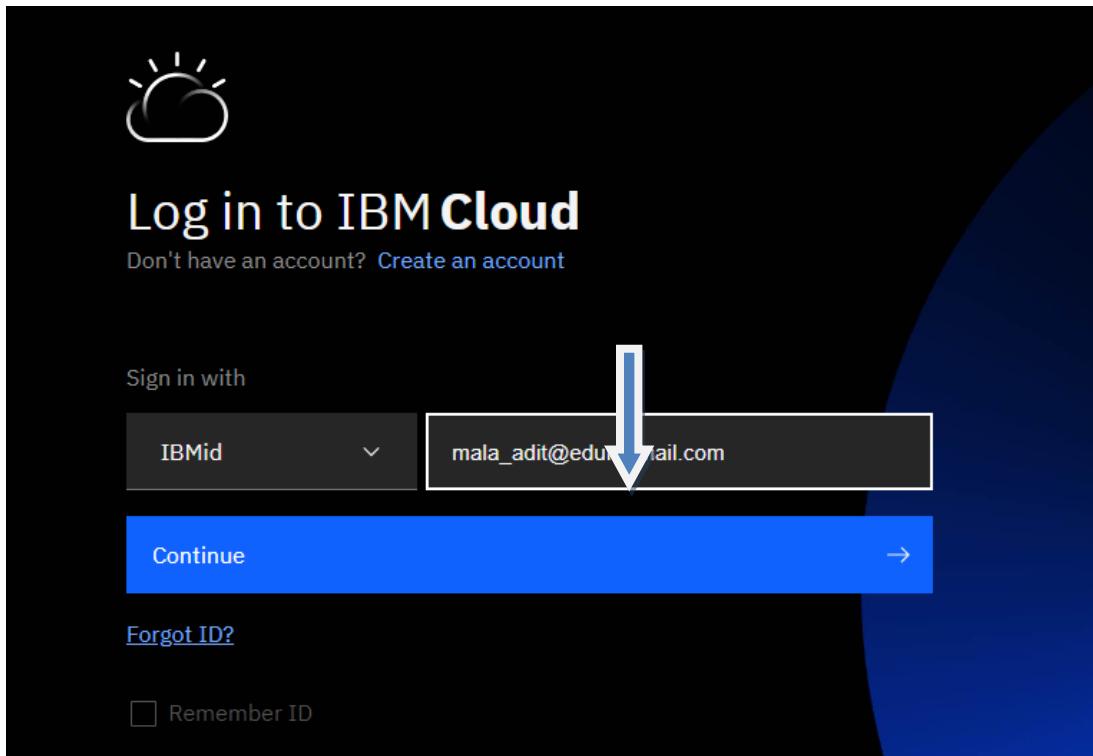
**Duration:** 2 hours

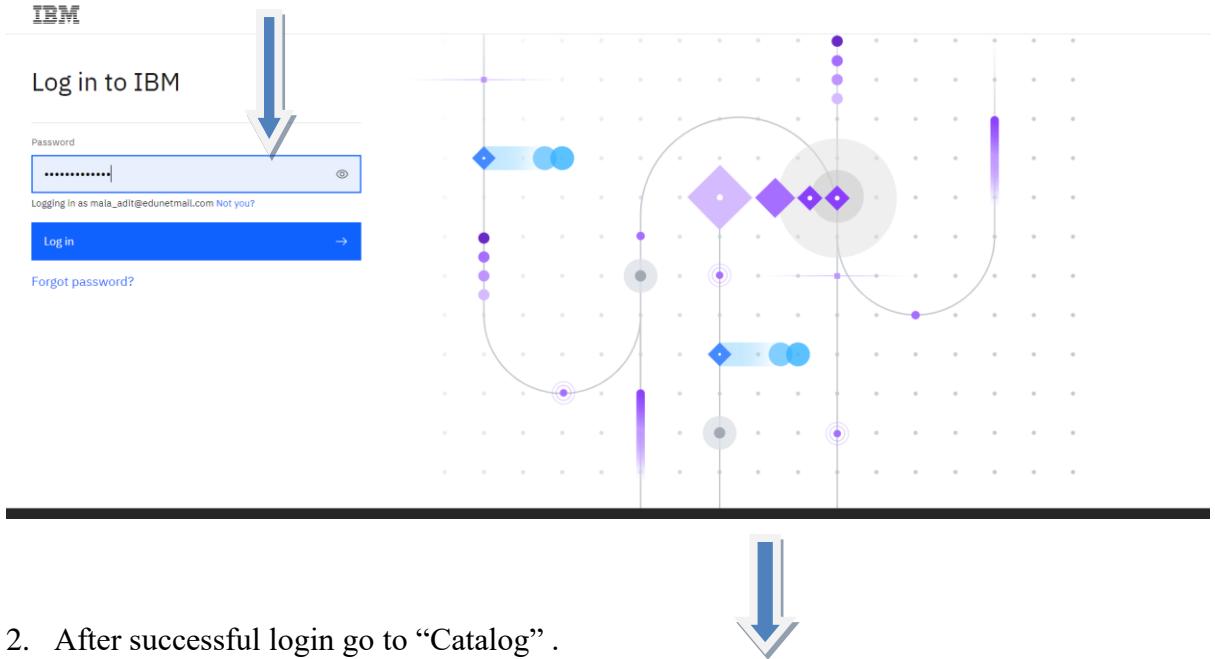
### List of Hardware/Software Requirement:

1. Laptop / Desktop with windows 10
2. Internet

### Code/Program/Procedure(with comments):

1. Login to IBM Cloud Account using given link <https://cloud.ibm.com/>





2. After successful login go to “Catalog” .

The screenshot shows the IBM Cloud Dashboard. At the top, there is a navigation bar with 'IBM Cloud', a search bar, and a user account section for 'Mala Mishra's Account'. Below the navigation bar is a main dashboard area. On the left, there is a sidebar with various icons for services like Build, Db2, Watson, and Watson Studio. The central area features several cards: 'Build' (Explore IBM Cloud with this selection of easy starter tutorials and services), 'Db2' (Get enterprise-level OLTP performance, 99.99% uptime SLA, automatic backups, compliance options and encryption at rest with Db2.), 'Build with Watson' (Chatbots, insights, recognizers, and more. Explore the AI platform for business.), 'Choose a Database' (Find the right IBM Cloud database for the job.), 'Use Watson Studio' (Watson Studio provides a suite of tools and a collaborative environment for data scientists, developers and domain experts.), 'Get Started with Watson Studio' (Get started with using AI and Cloud Object Storage in 15 minutes.), and 'Use Text to Speech' (Convert written text natural-sounding voices with Text to S). Below these cards are sections for 'News', 'Recent support cases', 'Planned maintenance', and 'IBM Cloud status'. A large blue arrow points down from the top of the dashboard towards the 'Catalog' tab in the navigation bar.

3. Go to storage and locate to object storage and click on it.

The screenshot shows the IBM Cloud Catalog interface. In the center, there's a search bar with the placeholder "Search the catalog...". Below it, a sidebar on the left contains filters for "Type" (All selected), "Delivery method" (OVA Images, Server Images, Terraform), and "Deployment target" (IBM Cloud Schematics, VMware vCenter Server). The main content area is titled "Storage" and shows "Viewing 23 products". A blue arrow points to the "Object Storage" card for "MinIO By IBM". The card describes MinIO as flexible, cost-effective, and scalable object storage for unstructured data. It also mentions Satellite Enabled, Lite plan, EU Supported, Financial Services Validated, HIPAA Enabled, IAM-enabled, and IBM supported.

4. Once you select Object Storage the screen looks like this.

The screenshot shows the "Cloud Object Storage" creation page in the IBM Cloud Catalog. At the top, there's a navigation bar with "Catalog / Services / Cloud Object Storage" and a search bar. The "Create" tab is selected. On the left, there's a "Choose an Infrastructure" section with two options: "IBM Cloud" (selected) and "Satellite". The "IBM Cloud" option describes it as creating, managing, and accessing storage in globally available data center locations. The "Satellite" option describes it as utilizing infrastructure from on-premise data centers or edge networks. Below this, there's a "Select a pricing plan" section with a note that prices do not include tax and are for United States. A table compares the "Lite" plan (free up to 25 GB per month) and the "Standard" plan (unlimited scalability and full functionality). The right side of the screen shows a "Summary" panel with details: "Cloud Object Storage" (Region: Global, Plan: Lite, Service name: Cloud Object Storage-85, Resource group: Default), a large "Create" button, and links for "Add to estimate" and "View terms".

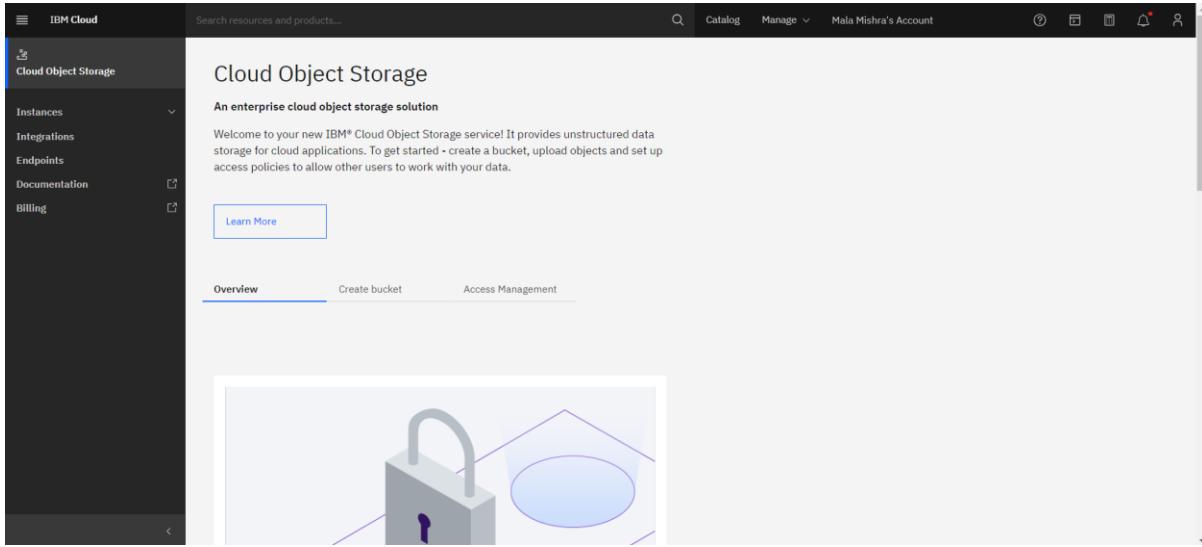
5. Now configure the resources and create it

The screenshot shows the IBM Cloud interface for creating a Cloud Object Storage instance. On the left, there's a table comparing different plan options: Lite, Standard, and One Rate. The 'Lite' plan is selected. On the right, a summary panel shows the service details: Cloud Object Storage, Region: Global, Plan: Lite, Service name: adit, and Resource group: Default. Below this, there are buttons for 'Create', 'Add to estimate', and 'View terms'. At the bottom, there's a configuration section for the resource, including fields for Service name (with 'adit' typed in), Select a resource group (set to 'Default'), and Tags.

## 6. Click on Create

This screenshot is similar to the previous one but shows the process after clicking the 'Create' button. The 'Create' button is now highlighted in blue. The summary panel on the right still displays the service details, and the configuration section at the bottom remains the same.

## 7. After selecting create object screen will look like this.



## 8. Now create the bucket, choose create Bucket .

**Create a bucket**

One of the crucial steps in designing your IBM® Cloud Object Storage is organizing your data into buckets to meet your needs. Few things to consider while creating a bucket - availability, data sovereignty, how often do you need to access the data.

**Create Bucket**

**Naming your bucket**  
Choose a unique name; all buckets in all regions across the globe share a single namespace.

**Avoid Personal Information**  
Personally Identifiable Information (PII): When

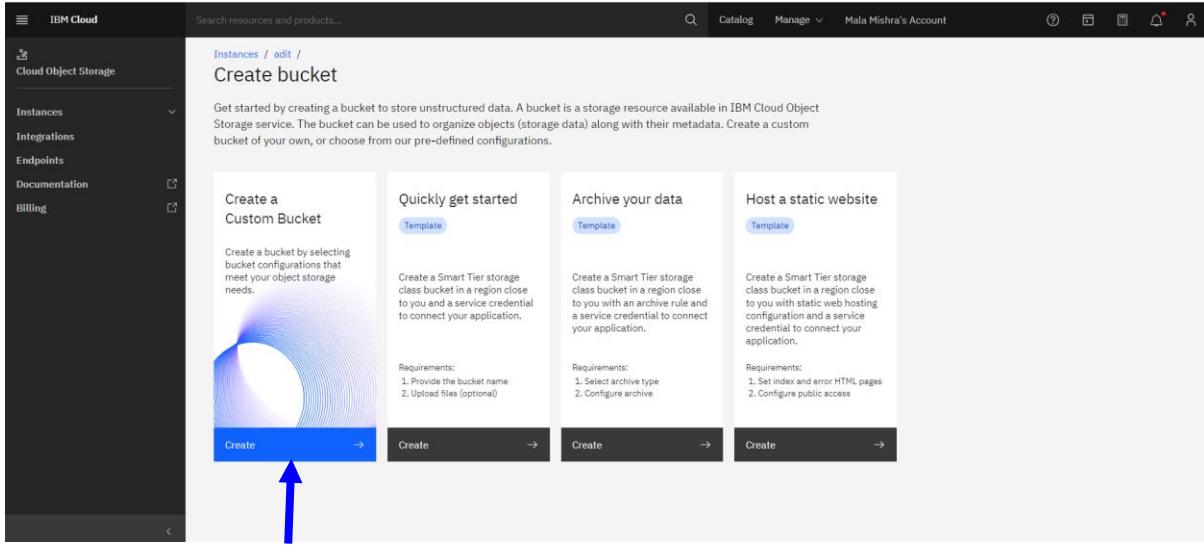
**Special Characters**  
Avoid using these characters: /!":?>< This will not cause

The screenshot shows the IBM Cloud Object Storage interface. On the left, there's a sidebar with options like Instances, Integrations, Endpoints, Documentation, and Billing. The main area has tabs for Overview, Create bucket (which is highlighted), and Access Management. Below the tabs, the title 'Create a bucket' is displayed. A text block explains the importance of organizing data into buckets. At the bottom of this section is a 'Create Bucket' button, which is overlaid with a large blue arrow pointing towards it.

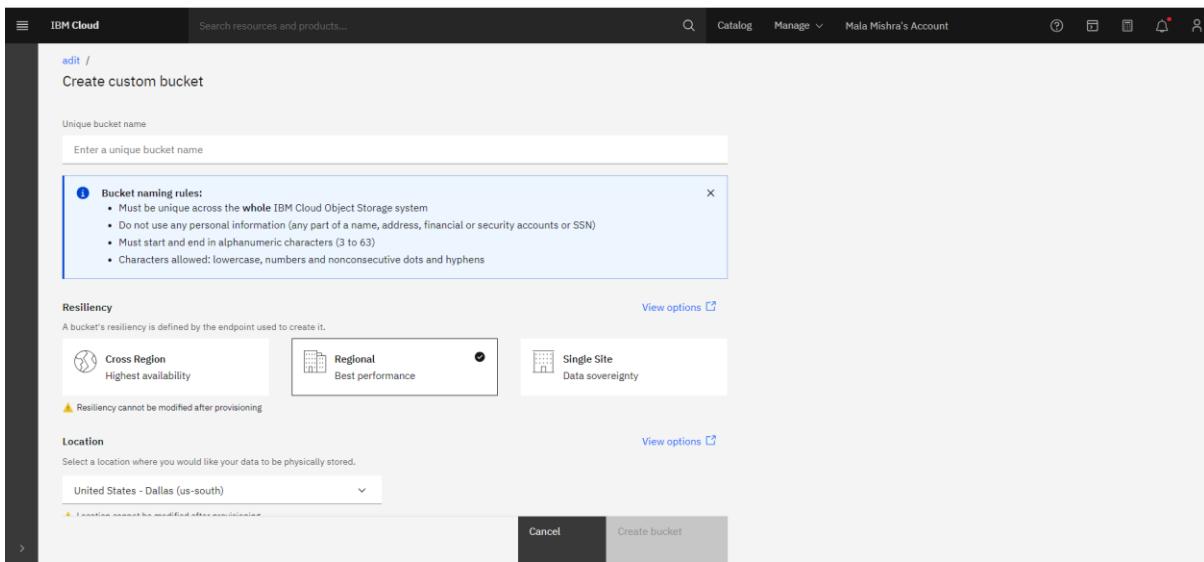
9. After selecting Create Bucket option the screen will look like this.

This screenshot shows the 'Create bucket' configuration page. It features four main options: 'Create a Custom Bucket' (selected), 'Quickly get started', 'Archive your data', and 'Host a static website'. Each option has a brief description and a 'Create' button. The 'Create a Custom Bucket' section includes a large blue 'Create' button at the bottom.

10. Locate to Create Custom Button option and click on Create.



After selecting screen will look like this



11. Fill the details, Give Bucket Name  
Select

IBM Cloud

Create custom bucket

Unique bucket name

adit

Bucket naming rules:

- Must be unique across the **whole** IBM Cloud Object Storage system
- Do not use any personal information (any part of a name, address, financial or security accounts or SSN)
- Must start and end in alphanumeric characters (3 to 63)
- Characters allowed: lowercase, numbers and nonconsecutive dots and hyphens

Resiliency

A bucket's resiliency is defined by the endpoint used to create it.

Cross Region Highest availability

Regional Best performance

Single Site Data sovereignty

View options

Location

Select a location where you would like your data to be physically stored.

Australia - Sydney (au-syd)

Cancel Create bucket

12. Choose the resiliency as Regional also select the location where you want to create.

Resiliency

A bucket's resiliency is defined by the endpoint used to create it.

Cross Region Highest availability

Regional Best performance

Single Site Data sovereignty

View options

Location

Select a location where you would like your data to be physically stored.

Australia - Sydney (au-syd)

Storage class

Choose storage class based on how often you expect to read the stored data. Pricing varies for each option.

Smart Tier New!

Smart Tier automatically gives you the lowest storage rate based on your monthly activity.

Standard

For active workloads that require higher performance and low latency and where data needs to be accessed frequently.

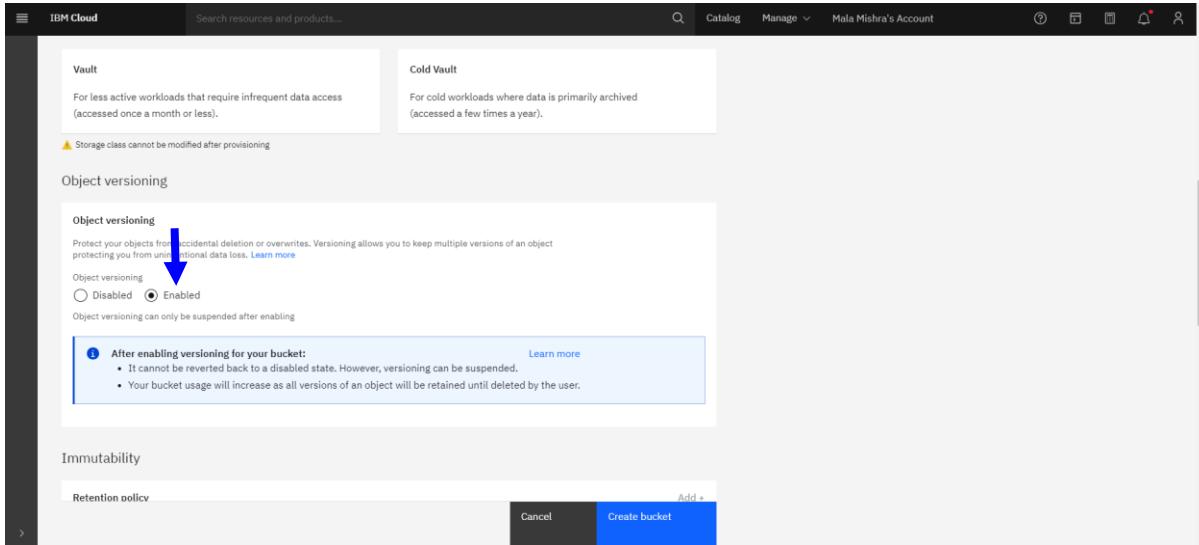
Vault

Cold Vault

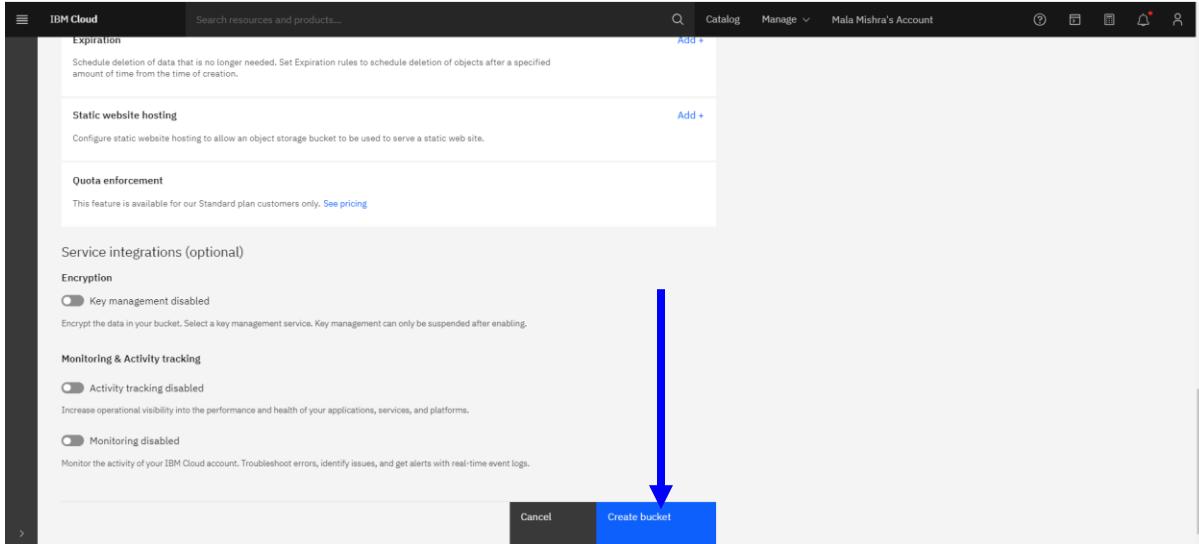
View pricing

Cancel Create bucket

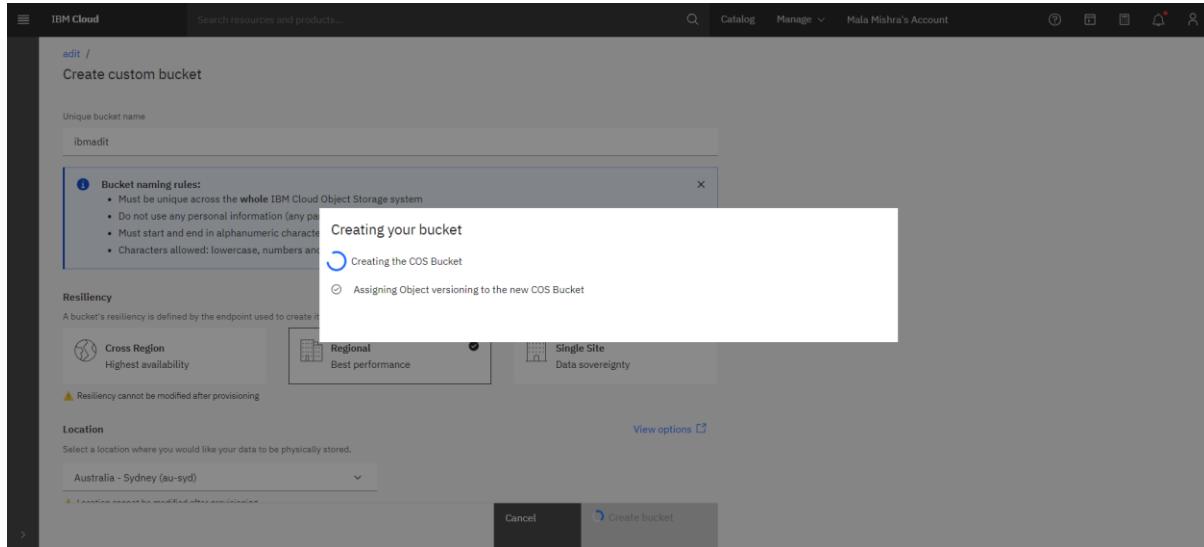
13. Select versioning as “enable”



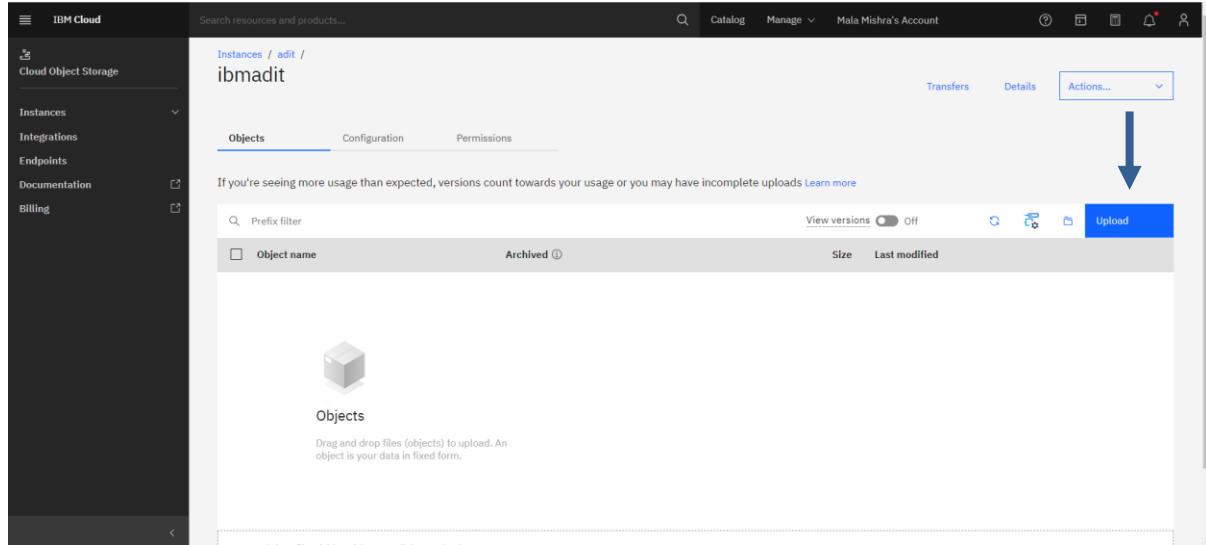
#### 14. Click on create button.



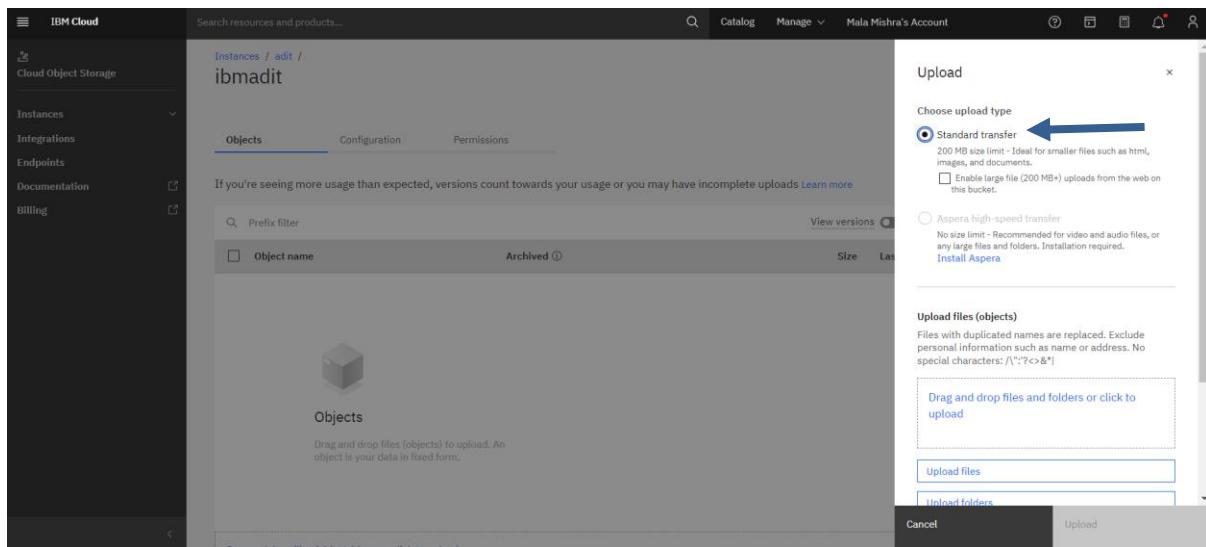
After creating on Create Bucket it will look like this.

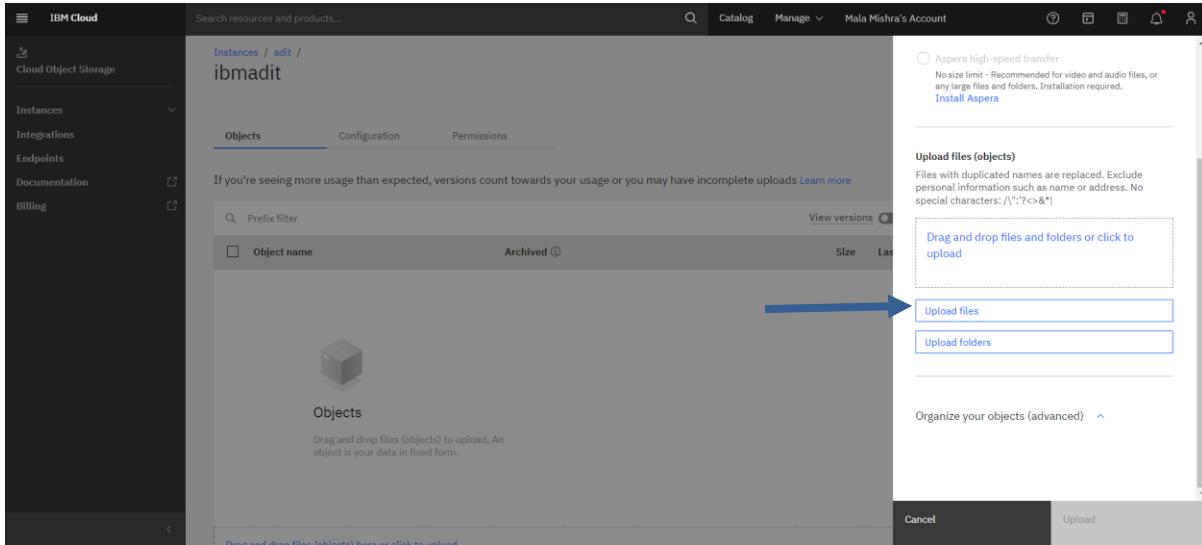


15. Now Upload the file in the bucket to upload a file click on upload.

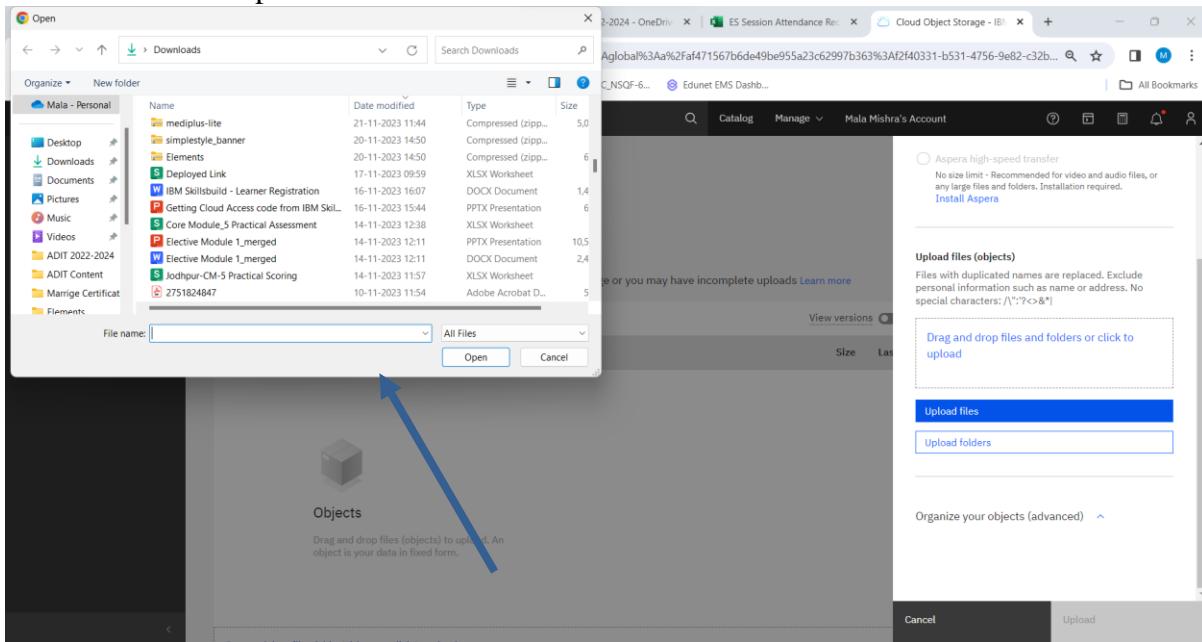


16. Now choose the upload type as standard transfer and select the file to upload.

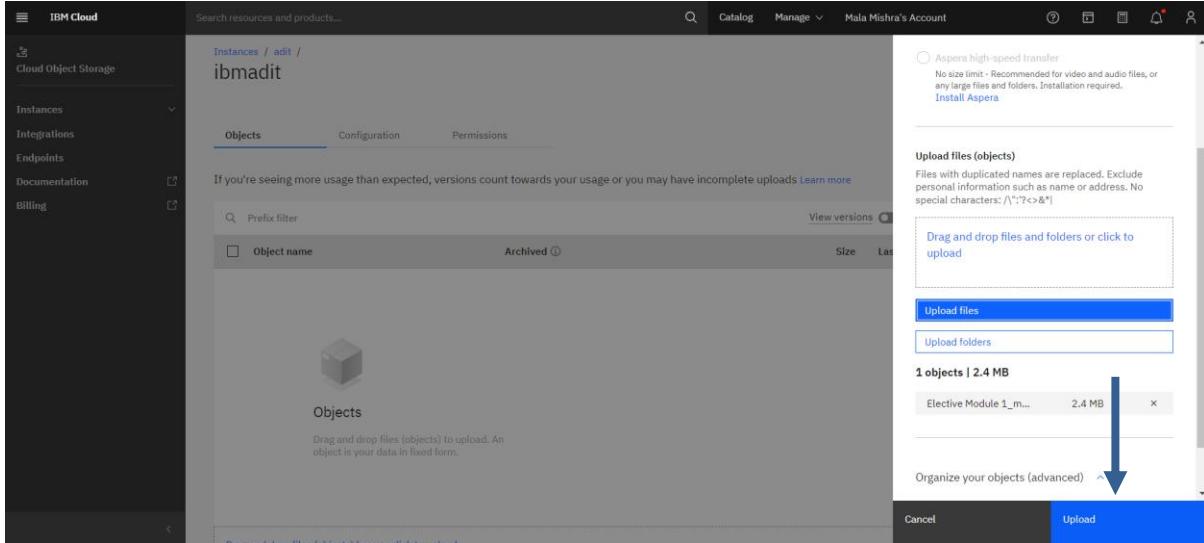




17. Choose the file to upload and select it.

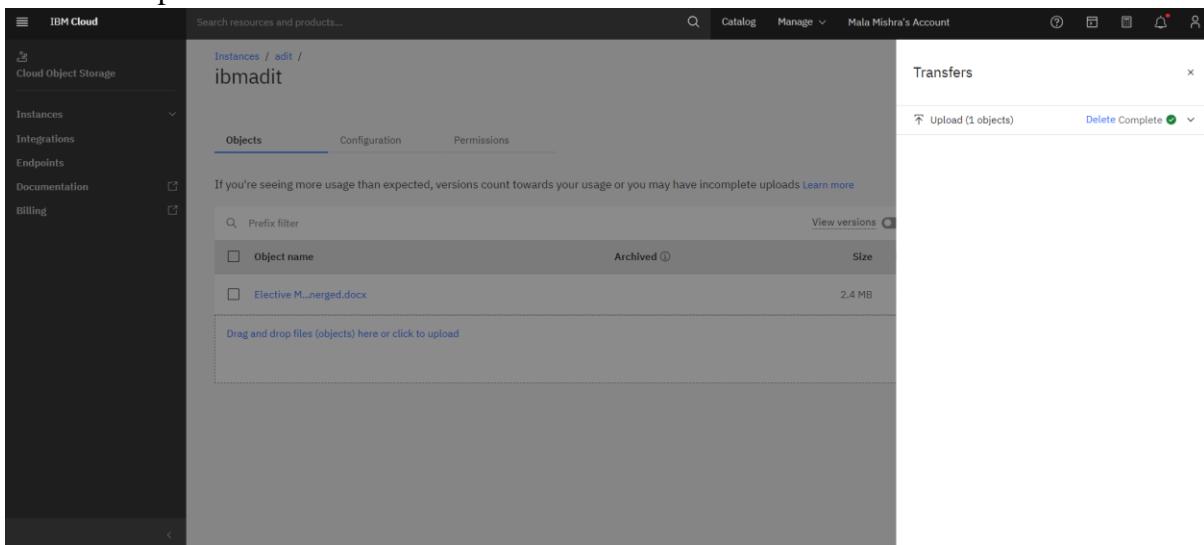


18. After file selection click on Upload.



(if you want to upload any folder click on upload folder)

## 19. Now after upload it will look like this.



## 20. You can also manage your object bucket to download and delete the bucket.

The screenshot shows the IBM Cloud Object Storage interface. On the left, there's a sidebar with options like Instances, Integrations, Endpoints, Documentation, and Billing. The main area shows a list of objects under the instance 'ibmadit'. There's one object named 'Elective M...erged.docx' which is archived. A blue arrow points to the 'Upload' button at the top right of the object list.

This screenshot is similar to the first one, but a context menu has been opened over the 'Elective M...erged.docx' file. The menu items shown are 'Object details', 'Restore', 'Manage tags', 'Download', and 'Delete'. A blue arrow points to the 'Object details' option in the menu.

21. Select the object which you have uploaded

If you're seeing more usage than expected, versions count towards your usage or you may have incomplete uploads [Learn more](#)

Object name	Archived	Size	Last modified
<a href="#">Elective Module 1_merged.docx</a>	Off	2.4 MB	2023-12-11 3:20 PM

[Elective Module 1\\_merged.docx](#) Click to upload

Elective Module 1\_merged.docx

Download object	Delete object
-----------------	---------------

Overview Versions Lifecycle Retention

**Object details**

Last modified 2023-12-11 3:20 PM	Object size 2.4 MB	Storage class Smart Tier	Tags 0 Tags
-------------------------------------	-----------------------	-----------------------------	----------------

**Access with Data Engine**

If this file is a supported format, you can access the object using a Data Engine instance. To learn more about supported file formats, visit [our docs](#).

Object Data Engine URL [cos://au-syd/ibmadit/Elective%20Module%201\\_merged.docx](cos://au-syd/ibmadit/Elective%20Module%201_merged.docx)

There is no Data Engine instance available. To provision a Data Engine instance, visit [Integrations](#).

Data Engine Instance  
No available instance

[Open in Data Engine](#)

22. From here you can Download and delete the object.

IBM Cloud

Cloud Object Storage

Instances / adit / ibmadit

Objects

Elective Module 1\_merged.docx

Download object Delete object

Overview Versions Lifecycle Retention

Last modified: 2023-12-11 3:20 PM Object size: 2.4 MB Storage class: Smart Tier Tags: 0 Tags Versioning: 1 versions

Access with Data Engine

If this file is of a supported format, you can access the object using an Data Engine instance. To learn more about support file formats, visit our docs.

Object Data Engine URL: cos://au-syd/ibmadit/Elective%20Module%201\_merged.docx

There is no Data Engine instance available. To provision an Data Engine instance, visit Integrations.

Data Engine instance:

No available instance

Open in Data Engine

IBM Cloud

Cloud Object Storage

Instances / adit / ibmadit

Objects

Elective Module 1\_merged.docx

Download object Delete object

Overview Versions Lifecycle Retention

Last modified: 2023-12-11 3:20 PM Object size: 2.4 MB Storage class: Smart Tier Tags: 0 Tags Versioning: 1 versions

Access with Data Engine

If this file is of a supported format, you can access the object using an Data Engine instance. To learn more about support file formats, visit our docs.

Object Data Engine URL: cos://au-syd/ibmadit/Elective%20Module%201\_merged.docx

There is no Data Engine instance available. To provision an Data Engine instance, visit Integrations.

Data Engine instance:

No available instance

Open in Data Engine

## Activity 5

**Aim:** Create a database and document using cloudant.

**Learning Outcome:** Able to understand Cloud, Architecture, App Development and Deployment in cloud environment.

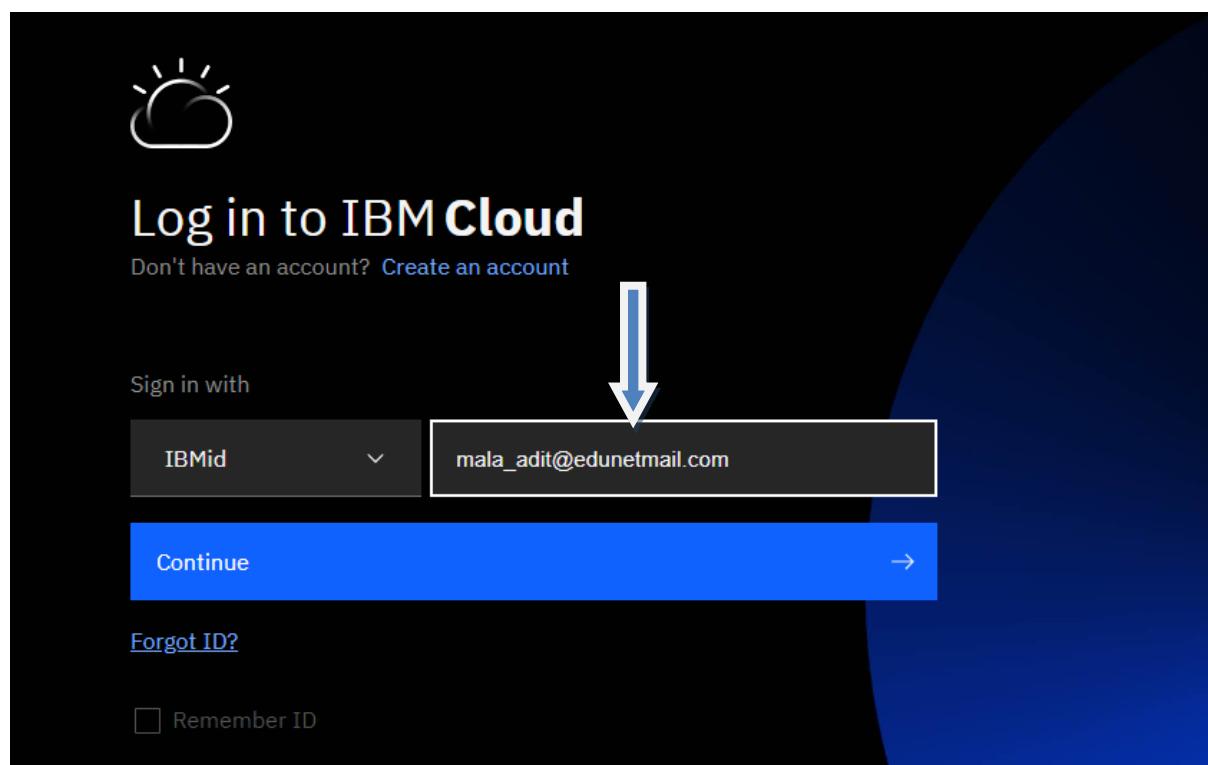
**Duration:** 2 hours

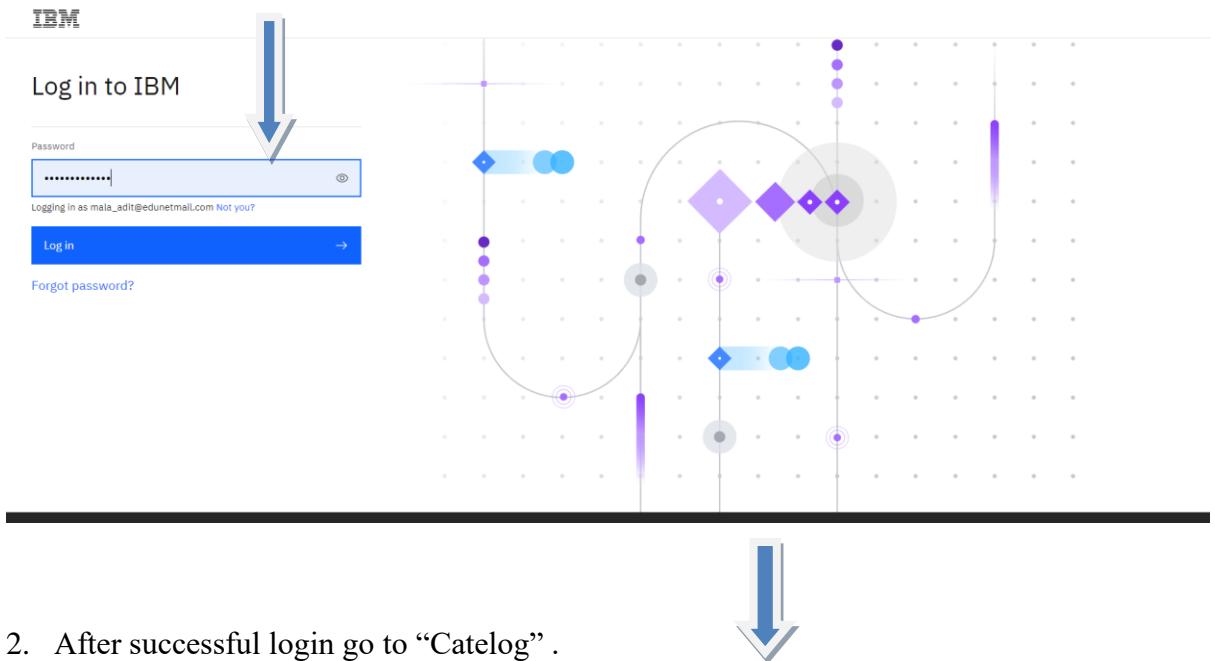
### List of Hardware/Software Requirement:

1. Laptop / Desktop with windows 10
2. Internet

### Code/Program/Procedure (with comments):

1. Login to IBM Cloud Account using given link <https://cloud.ibm.com/>





2. After successful login go to “Catalog” .

The screenshot shows the IBM Cloud Dashboard. At the top, there is a navigation bar with 'IBM Cloud', a search bar, and a user account section for 'Mala Mishra's Account'. Below the navigation bar is a main dashboard area. On the left, there is a sidebar with various icons for services like Build, Db2, Watson, and Watson Studio. The main dashboard features several cards: 'Build' (Explore IBM Cloud with this selection of easy starter tutorials and services), 'Db2' (Get enterprise-level OLTP performance, 99.99% uptime SLA, automatic backups, compliance options and encryption at rest with Db2.), 'Build with Watson' (Chatbots, insights, recognizers, and more. Explore the AI platform for business.), 'Choose a Database' (Find the right IBM Cloud database for the job.), 'Use Watson Studio' (Watson Studio provides a suite of tools and a collaborative environment for data scientists, developers and domain experts.), 'Get Started with Watson Studio' (Get started with using AI and Cloud Object Storage in 15 minutes.), 'Use Text to Speech' (Convert written text natural-sounding voices with Text to S), 'News' (Get ready for change with IBM Cloud Training, Data center consolidation: Strategy and best practices, Hybrid cloud examples, applications and use cases, Tokens and login sessions in IBM Cloud), 'Recent support cases' (View all), 'Planned maintenance' (View all), and 'IBM Cloud status' (View all). A large blue arrow points downwards from the top of the dashboard towards the 'Catalog' tab in the navigation bar.

3. Go to database and locate to Cloudant and click on it

Databases

Type: All

Delivery method: Helm charts, OVA Images

Deployment target: IBM Cloud Kubernetes Service, VMware vCenter Server

<https://cloud.ibm.com/catalog/services/cloudant>

Category	Service	Description	Plan
DataStage	DataStage	Create ETL and data pipeline services for real-time, micro-batch, and batch data orchestration.	Lite • Free • EU Supported • IAM-enabled • IBM supported
	Cloudant	A scalable JSON document database for web, mobile, IoT, and serverless applications.	Lite • Free • EU Supported • IAM-enabled • IBM supported
My	Databases for MySQL		
Ds	Databases for DataStax		
Pg	Databases for PostgreSQL	PostgreSQL is a powerful, open source object-relational database that is highly customizable.	Satellite Enabled • EU Supported • HIPAA Enabled • IAM-enabled • Service Endpoint Supported • IBM supported
En	Databases for EDB	EDB is a PostgreSQL-based database eng optimized for performance, developer productivity, and compatibility with Oracle.	EU Supported • HIPAA Enabled • IAM-enabled • Service Endpoint Supported • IBM supported
Mg	Databases for MongoDB		
Es	Databases for Elasticsearch		

after selecting Cloudant the screen will look like this.

Catalog / Services /

## Cloudant

A scalable JSON document database for web, mobile, IoT, and serverless applications.

Create    About

Select an offering

Cloudant

Cloudant is a fully managed JSON document database that offers independent serverless scaling of throughput capacity and storage.

Lite plan available

Select an environment

Multitenant    Dedicated

Your instance will be running securely on environments with shared resources.

Available regions

Offering	Price	Throughput	Storage
Cloudant Lite	Free	20 Reads/sec 10 Writes/sec 5 Global Queries/sec	1 GB Storage Included

Create    Add to estimate

4. Now create a Cloudant Database.
5. Let everything keep as it is, you might rename the database INSTANCE NAME, and Click on create.

**Select an offering**

**Cloudant**  
IBM Cloudant is a fully managed JSON document database that offers independent serverless scaling of throughput capacity and storage.  
Lite plan available

**Select an environment**

**Multitenant** **Dedicated**  
Your instance will be running securely on environments with shared resources.

**Available regions**  
Dallas

**Configure Cloudant instance**

Instance name: ADITCloudant  
Resource group: Default

**Summary**

**Cloudant Lite** **Free**  
20 Reads/sec  
10 Writes/sec  
5 Global Queries/sec  
1 GB Storage  
Included

**Create** **Add to estimate**

**Tags**  
Examples: env:dev, version-1

**Authentication method** **IAM**

**Plan**

**Lite**  
Full functionality for development and evaluation with a set capacity. Only one Lite plan instance per account.  
Free - Only in multi-tenant

**Standard**  
Granular control over provisioned throughput capacity allocated. Billing prorated hourly.  
Starting at \$86.20/month

**Capacity**  
20 Reads per second    10 Writes per second    5 Queries per second    1 GB Storage included

**Cost calculator**

**Summary**

**Cloudant Lite** **Free**  
20 Reads/sec  
10 Writes/sec  
5 Global Queries/sec  
1 GB Storage  
Included

**Create** **Add to estimate**

6. It redirects you to your resource list, after getting provisioned, you might start.

The screenshot shows the IBM Cloud Resource list interface. At the top, there's a header with 'Resource list' and a 'Create resource' button. Below the header is a search bar and filter options for Name, Group, Location, Product, Status, and Tags. The main area displays a list of resources categorized under Compute, Containers, Networking, Storage, Converged Infrastructure, Enterprise applications, AI / Machine Learning, Analytics, Blockchain, Databases, Developer tools, and Logging and monitoring. A specific entry for 'ADITCloudant' is highlighted with a blue arrow pointing to it. The ADITCloudant entry includes details such as Default group, Chennai location, Cloudant product, Provision in progress status, and a copy icon.

7. Open the service you created.

Click on the database name.

It will take you to another window like this. you have deployment methods listed.

The screenshot shows the ADITCloudant service details page. At the top, there are tabs for 'Manage', 'Overview' (which is selected), 'Capacity', and 'Docs'. On the left, there are sections for 'Service credentials', 'Plan', and 'Connections'. The 'Overview' tab displays 'Deployment details' with fields for CRN, Location (Chennai), External endpoint, External endpoint (preferred), Authentication methods (IBM Cloud IAM), Activity Tracker event types (Management), and Disk encryption (Yes). At the bottom, there's a 'Capacity details' section with a URL: <https://9eaac5eb-aa3a-4fb1-b27a-642d1acef164-bluemix.cloudant.com>.

8. Now lunch the dashboard, to get a new window

Resource list / ADITCloudant Active Add tags

**Overview** Details Actions... Launch Dashboard

Manage	Service credentials
Plan	<b>Deployment details</b>
Connections	CRN crn:v1:bluemix:public:cloudantnosqldb:in-che:a/af471567b6de49be955a23c62997b363:6f088da3-dc58-4289-8f3d-5099886cf8eb:
	Location Chennai
	External endpoint <a href="https://9eaac5eb-aa3a-4fb1-b27a-642d1acef164-bluemix.cloudant.com">https://9eaac5eb-aa3a-4fb1-b27a-642d1acef164-bluemix.cloudant.com</a>
	External endpoint (preferred) <a href="https://9eaac5eb-aa3a-4fb1-b27a-642d1acef164-bluemix.cloudantnosqldb.appdomain.cloud">https://9eaac5eb-aa3a-4fb1-b27a-642d1acef164-bluemix.cloudantnosqldb.appdomain.cloud</a>
	Authentication methods IBM Cloud IAM
	Activity Tracker event types  Management
	Disk encryption Yes. Automatically generated disk encryption key.

**Databases** Database name Create Database { } JSON

Name	Size	# of Docs	Partitioned	Actions

Showing 1–0 of 0 databases. Databases per page 20 < 1 >

## 9. Create a DATABASE

Databases

Name	Size	# of Docs	Partitioned	Actions

Showing 1–0 of 0 databases. Databases per page 20 ▾ 1 >

<https://9eaaac5eb-aa3a-4fb1-b27a-642d1acef164-bluemix.cloudant.com/dashboard.html#monitoring>

10. Give the Database Name , you might keep the field default.

Databases

Name	Size	# of Docs	Partitioned

Create Database

Database name

Partitioning

Non-partitioned - recommended for most workloads  
 Partitioned

Which should I choose?

Showing 1–0 of 0 databases. Cancel Create

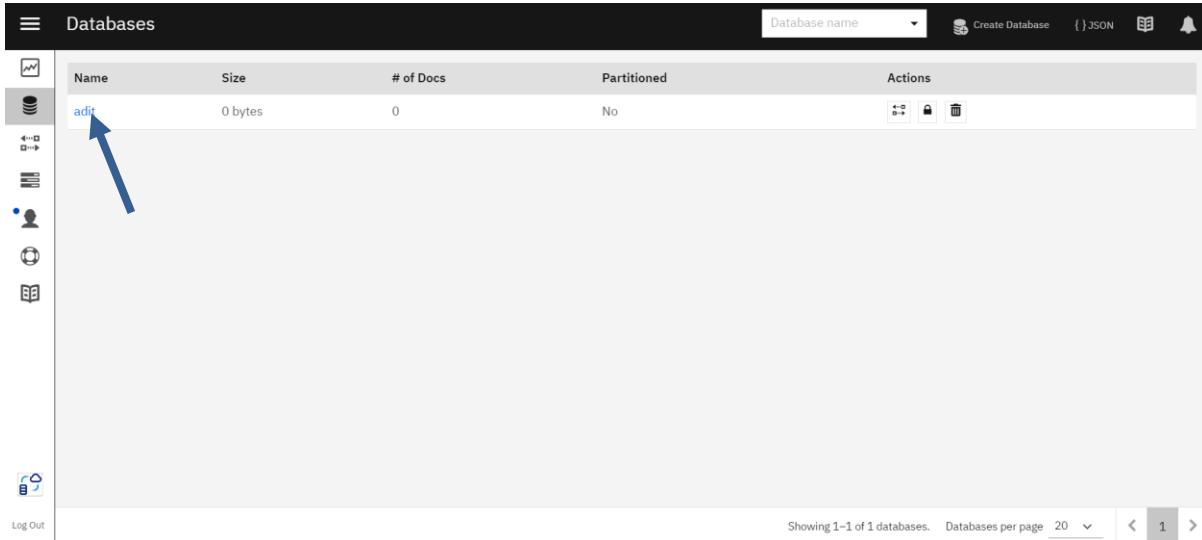
11. Create the Database.

The screenshot shows the Apache CouchDB Futon interface. On the left is a sidebar with icons for Databases, Views, Replicators, Users, and Groups. The main area is titled 'Databases' and lists columns: Name, Size, # of Docs, and Partitioned. A message at the bottom says 'Showing 1–0 of 0 databases.' To the right, a modal window titled 'Create Database' has a 'Database name' field containing 'adit'. Below it are 'Partitioning' options: 'Non-partitioned - recommended for most workloads' (selected) and 'Partitioned'. A question 'Which should I choose?' is followed by a large blue 'Create' button.

12. The database is created now.

The screenshot shows the Apache CouchDB Futon interface with the 'adit' database selected in the sidebar. The main area displays a list of database functions: All Documents, Query, Permissions, Changes, and Design Documents. A large cloud icon is centered, and the message 'No Documents Found' is displayed. At the bottom, it says 'Showing 0 documents. Documents per page: 20'. A blue arrow points to the 'adit' database name in the sidebar.

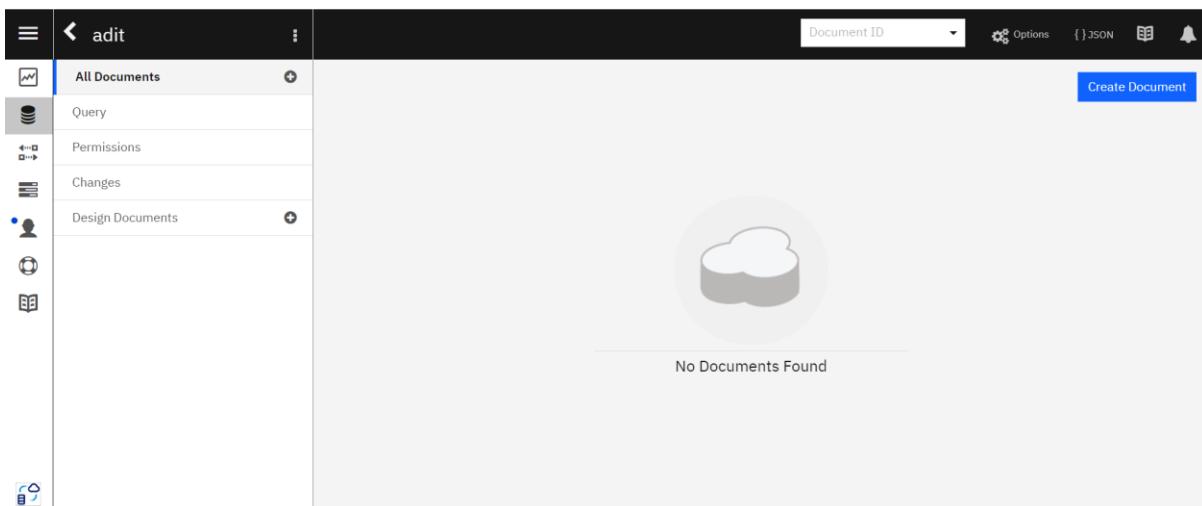
13. Click on database name and select the database created



Databases

Name	Size	# of Docs	Partitioned	Actions
adit	0 bytes	0	No	

Showing 1–1 of 1 databases. Databases per page 20 < 1 >



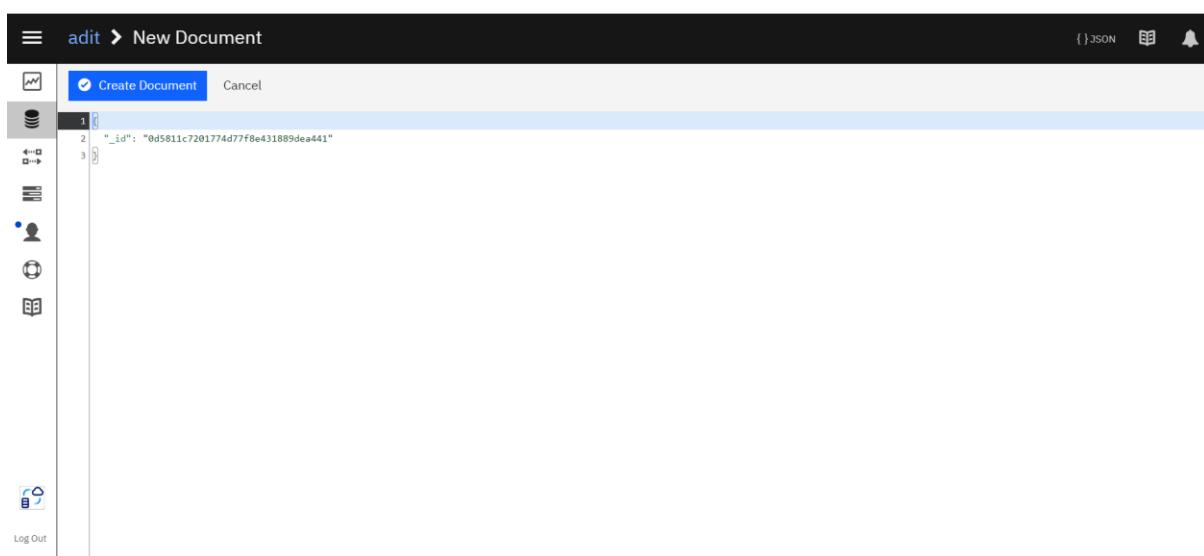
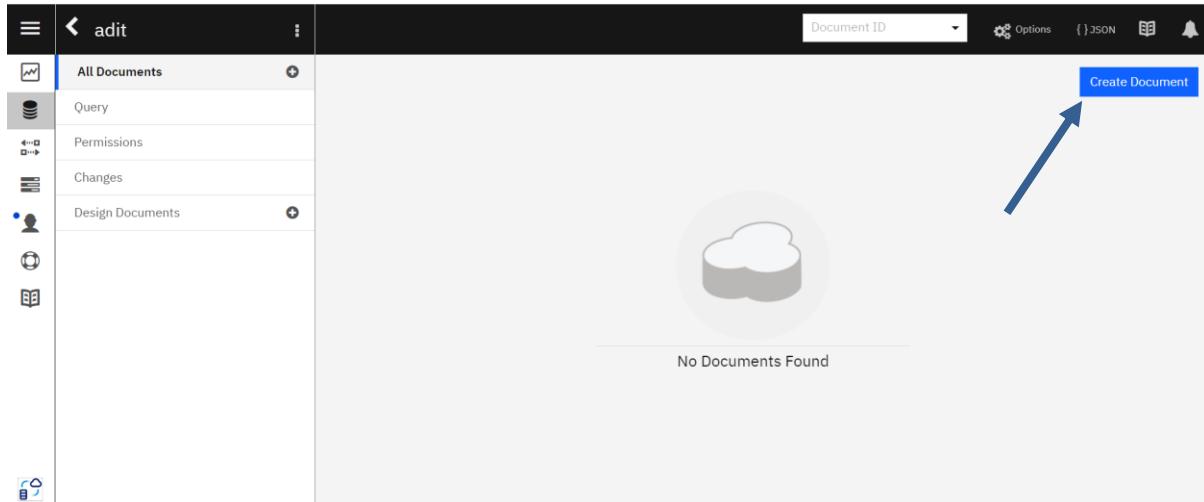
adit

- All Documents
- Query
- Permissions
- Changes
- Design Documents

Create Document

No Documents Found

14. Now you can create NoSQL Collection.



15. Edit the collection as per need;

```

1
2 "_id": "A101",
3 "name" : "Peter",
4 "location": "Mumbai",
5 "Phone" : 9876543210
6

```

16. Run the query by clicking on “Create Document”.

The 'Create Document' button is highlighted with a blue arrow.

```

1
2 "_id": "A101",
3 "name" : "Peter",
4 "location": "Mumbai",
5 "Phone" : 9876543210
6

```

17. Collection is thus created.

The screenshot shows the Apache CouchDB Futon interface. On the left is a sidebar with icons for All Documents, Query, Permissions, Changes, and Design Documents. The main area has tabs for Table, Metadata (which is selected), and JSON. A table displays one document:

	<b>id</b>	<b>key</b>	<b>value</b>
<input type="checkbox"/>	A101	A101	{ "rev": "1-1bab0ac0396e0dd85ba84750adcc976a" }

At the bottom, it says "Showing document 1 - 1. Documents per page: 20".

#### 18. Similarly You can create multiple collections.

This screenshot is identical to the one above, showing the Apache CouchDB Futon interface with a single document in the 'All Documents' collection. The document details are the same:

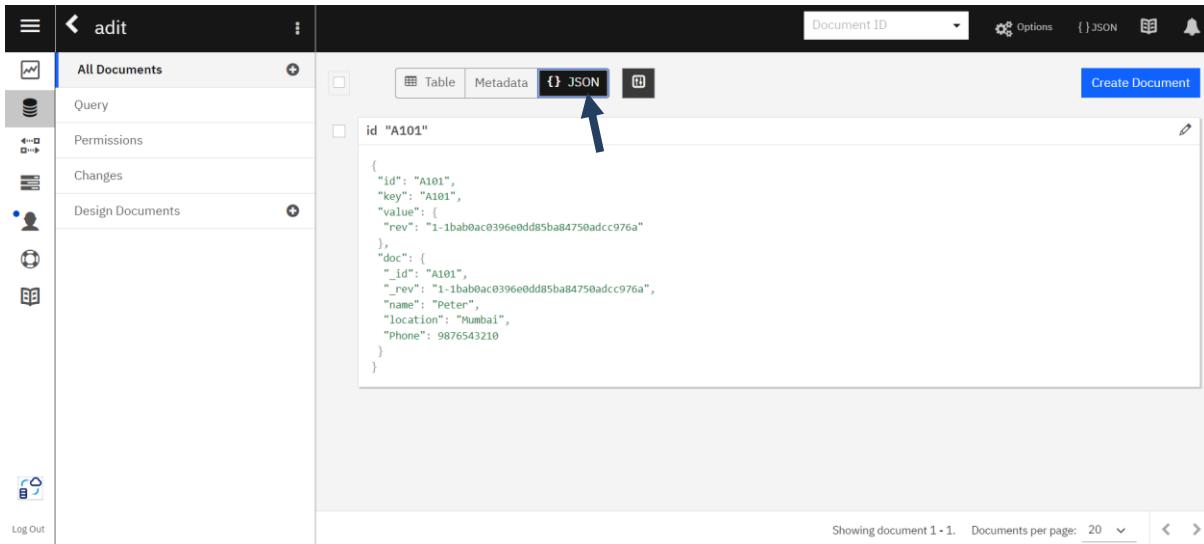
	<b>id</b>	<b>key</b>	<b>value</b>
<input type="checkbox"/>	A101	A101	{ "rev": "1-1bab0ac0396e0dd85ba84750adcc976a" }

At the bottom, it says "Showing document 1 - 1. Documents per page: 20".

#### 19. Default view of the collection is METADATA, but you can change to TABLE VIEW or JSON format;

The screenshot shows a database interface with a sidebar on the left containing icons for All Documents, Query, Permissions, Changes, and Design Documents. The main area displays a table with one row. The table has columns: id, key, and value. The id column contains A101, the key column contains A101, and the value column contains a JSON object: {"rev": "1-1bab0ac0396e0dd85ba84750adcc976a"}. At the top right, there are buttons for Document ID, Options, JSON, and a bell icon. A blue button labeled 'Create Document' is also visible.

This screenshot is similar to the first one, but the 'Table' button in the top navigation bar is highlighted with a blue arrow. The main table view remains the same, showing the single document with id A101, key A101, and value {"rev": "1-1bab0ac0396e0dd85ba84750adcc976a"}. The interface includes a sidebar with icons for All Documents, Query, Permissions, Changes, and Design Documents, and a bottom section for logging out and document filtering.



The screenshot shows the IBM Cloudant interface. On the left, there's a sidebar with icons for All Documents, Query, Permissions, Changes, and Design Documents. The main area has tabs for Table, Metadata, and JSON, with the JSON tab selected. A blue arrow points to the JSON tab. Below it, a document with ID "A101" is displayed in JSON format:

```
{  
  "id": "A101",  
  "key": "A101",  
  "value": {  
    "rev": "1-1bab0ac0396e0dd85ba84750adcc976a",  
    "doc": {  
      "_id": "A101",  
      "_rev": "1-1bab0ac0396e0dd85ba84750adcc976a",  
      "name": "Peter",  
      "location": "Mumbai",  
      "Phone": 9876543210  
    }  
  }  
}
```

At the bottom right, it says "Showing document 1 - 1. Documents per page: 20".

## Activity 6

**Aim:** Load an external data (CSV) using db2.

**Learning Outcome:** Able to understand IBM db2 and the CRUD operations.

**Duration:** 3 hours

### List of Hardware/Software requirements:

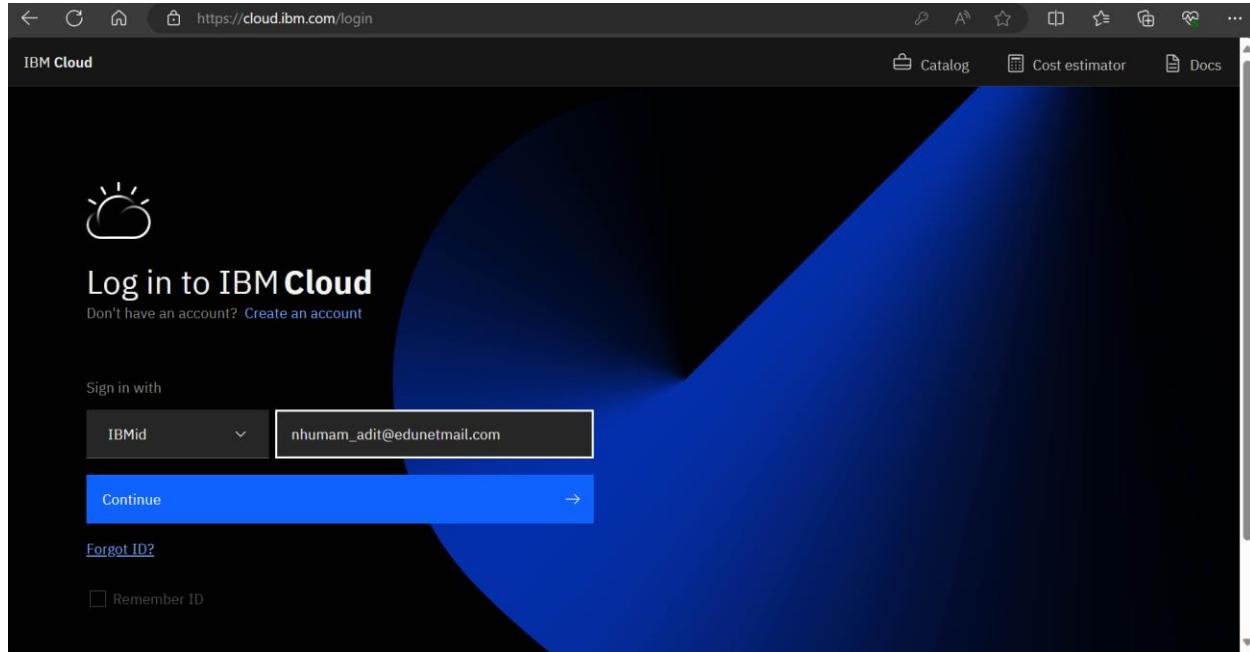
- 1 OS: Windows 10/11, or MacOS, or Linux distributions.
- 2 Web Browser: Microsoft Edge, Google Chrome, Mozilla Firefox, Brave or any compatible browser.
- 3 IBM Cloud Account

### Code/Program/Procedure (with comments):

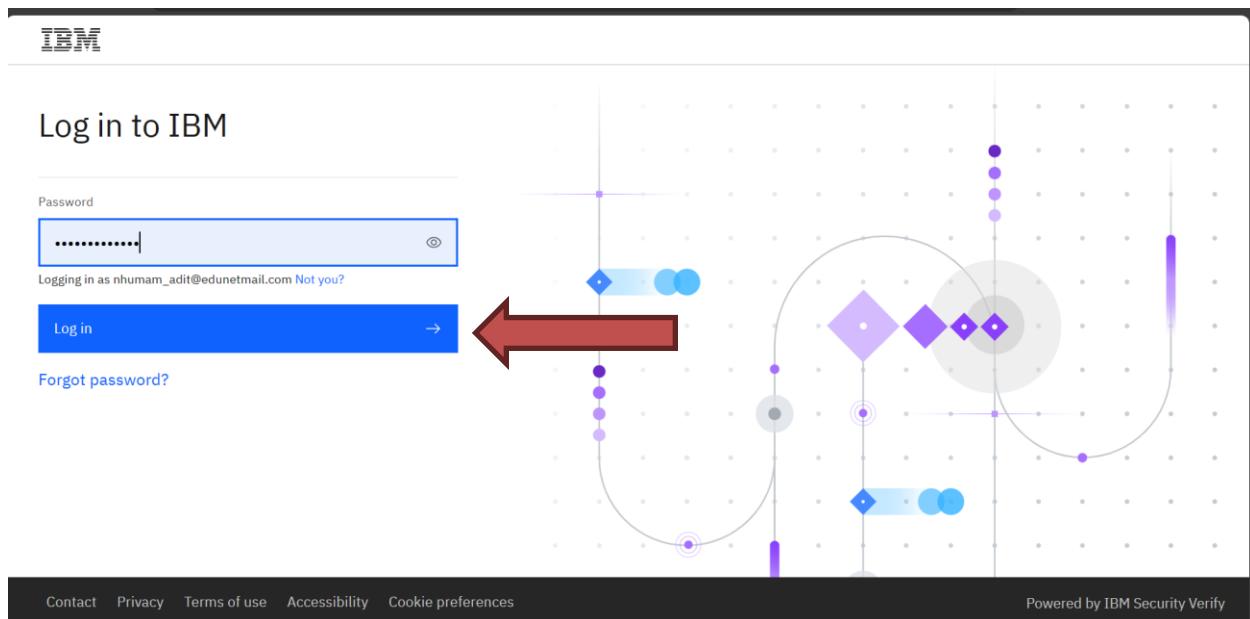
What is IBM Db2?

IBM® Db2® is the [cloud-native](#) database built to power low-latency transactions and real-time analytics at scale. It provides a single engine for DBAs, enterprise architects and developers to keep critical applications running, store and query anything, and power faster decision-making and innovation across your organization. Built on decades of innovation in data security, scalability and availability, you can use Db2 to keep your applications and analytics protected, highly performant and resilient, anywhere.

Step 1: Open [IBM Cloud](#) in your browser.



Step 2: Fill in you ID & Password as per the prompt and click login



Step 3: You would be redirected to your dashboard

The screenshot shows the IBM Cloud dashboard. At the top, there's a navigation bar with 'IBM Cloud', a search icon, 'Catalog', 'Manage', and 'Nashit Humam's Account'. Below the navigation is a header with 'Dashboard' and 'Edit dashboard', 'Upgrade account', and a 'Create resource' button. A sidebar on the left contains icons for various services like Compute, Storage, and Network. The main area has a 'For you' section with cards for 'Build', 'Explore offerings', 'Visit the IBM Cloud catalog', and 'Build cloud-native apps using IBM Cloud Object Storage'. Below this is a news section with 'News' and 'Planned maintenance' tabs. A red arrow points from the text in Step 4 to the 'Catalog' button in the top right of the dashboard header.

Step 4: Click on Catalog, to navigate to different resources available.

The screenshot shows the IBM Cloud Catalog page. At the top, it has the same navigation bar as the dashboard. The main content area displays a grid of service cards, each with a title, description, and a 'Getting started' button. A red arrow points from the text in Step 5 to the 'Catalog' button in the top right of the dashboard header, which now highlights the 'Catalog' tab.

Step 5: This brings you the list of various resources available. You might go for databases or search for db2 from the catalog search

The screenshot shows the IBM Cloud Catalog interface. At the top, there's a navigation bar with 'IBM Cloud' and various account-related icons. Below it is a search bar labeled 'Search the catalog...'. A red arrow points from the text 'Step 6: Search for db2' down to the search bar. The main area is titled 'Catalog' and shows 'Viewing 223 products'. On the left, a sidebar lists categories: Compute (35), Containers (11), Networking (30), Storage (23), and Converged infrastructure (3). The right side displays two product cards: 'Power Virtual Server with VPC landing zone' and 'Cloud Object Storage on VPC for SAP HANA Backup'. Both cards have a 'Deployable architecture' badge.

This screenshot shows the same IBM Cloud Catalog interface as above, but with a more detailed view of the category list. The sidebar now includes additional categories: Enterprise applications (3), AI / Machine Learning (25), Analytics (16), Blockchain (1), and Databases (21). A red arrow points from the text 'Step 6: Search for db2' down to the 'Databases' category. The main product cards remain the same: 'Power Virtual Server with VPC landing zone' and 'Cloud Object Storage on VPC for SAP HANA Backup'.

Step 6: This lists all the database type available on IBM Cloud. Slide down a little to navigate to db2. And open it.

**Databases**

Type: All

Delivery method: Helm charts, OVA Images

DataStage  
By IBM  
Create ETL and data pipeline services for real-time, micro-batch, and batch data orchestration.  
Lite • Free • IAM-enabled • IBM supported

Cloudant  
By IBM  
A scalable JSON document database for web, mobile, IoT, and serverless applications.  
Lite • Free • EU Supported • IAM-enabled • IBM supported

IBM Cloud catalog

Region: Dallas, Frankfurt, London, Madrid, Milan

Release: Show more, Deprecated

Support: IBM supported, Third party supported

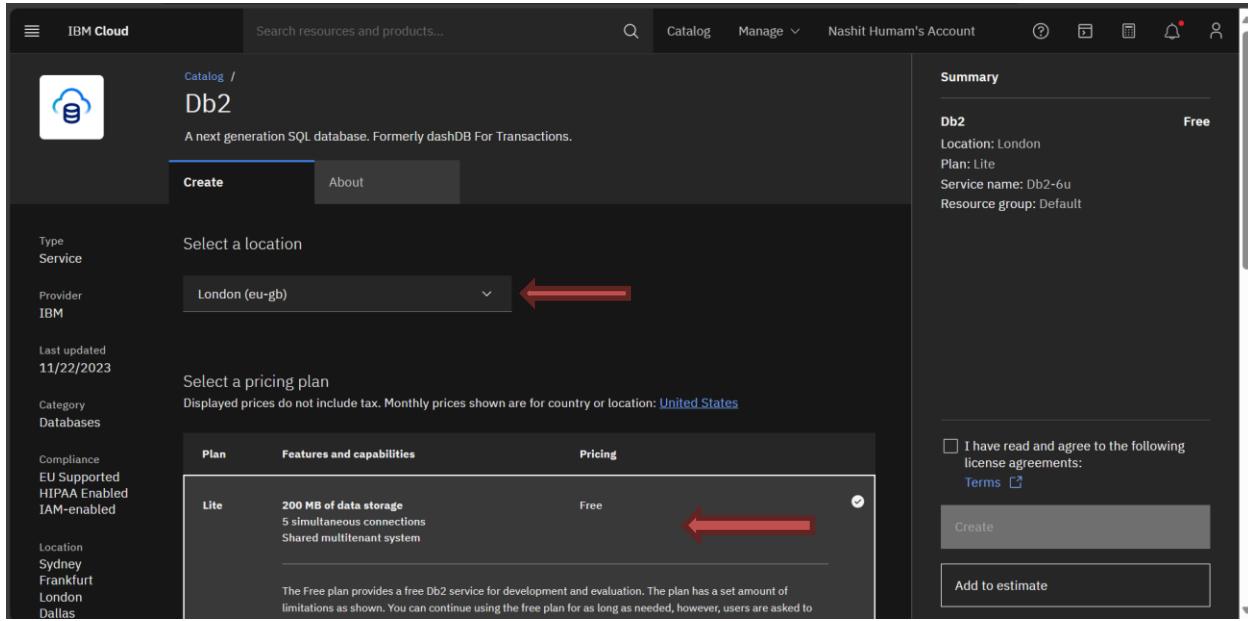
<https://cloud.ibm.com/catalog/services/db2>

**Data Engine (previously SQL Query)**  
By IBM  
Read, analyze, store and stream data in Cloud Object Storage with ANSI SQL. Manage table metadata in a Hive metastore compatible catalog.  
Lite • Free • IAM-enabled • IBM supported

**Db2**  
By IBM  
A next generation SQL database. Formerly dashDB For Transactions.  
Lite • Free • EU Supported • HIPAA Enabled • IAM-enabled • IBM supported

**Db2 Warehouse**  
By IBM  
Deploy and manage a MongoDB cluster to protect your

Step 7: You are now on CREATE RESOURCE page. Make sure you have selected LONDON as your region & Free Tier selected.



Step 8: Slide a little for options to configure your resource. And CREATE.

- f. You might rename your SERVICE NAME, to something relevant like (adit, nsti) so that you might recognize when you are working on a project, with several number of instances.
- g. SELECT A RESOURCE GROUP: you might add a RESOURCE GROUP, to easily handle and navigate between projects. For free tier we have a DEFAULT RESOURCE GROUP only.
- h. TAGS: To identify the phase and version , you might define the tags. It is optional, you might leave it blank. But, it is suggested to configure it to let the team understand the phase the project is in. configuration needs to be in key:value or a term pair like;

*env:code; env:prod; env:test; env:deploy; ver:1; ver:2 etc*

- i. ACCESS MANAGEMENT TAGS: Optional. But you might configure to help yourself apply flexible access policies on specific resources. Configuration needs to be in key:value pair like;

*env:prod; env:client; env:team; version:1 etc*

- j. EMAIL: For updates on the current resource you are creating. IBM team might reach you regarding the product, connections, bills etc. You might leave it blank.

IBM Cloud      Search resources and products...      Catalog      Manage      Nashit Human's Account

Base instance starts at 4 vCPU x 16 GB RAM x 20 GB Storage Uses dedicated virtual machines

\$0.314 USD/Virtual Processor Core-Hour  
\$0.000031 USD/BACKUP\_GIGABYTE\_HOURS  
\$0.10 USD/SERVICEENDPOINT\_INSTANCE\_HOURS

**Summary**

**Db2**      Free  
Location: London  
Plan: Lite  
Service name: Db2-6u  
Resource group: Default

Configure your resource

Service name: Db2-6u      Select a resource group: Default

Tags: Examples: env:dev, version-1      Access management tags: Examples: access:dev, proj:version-1

Email: Please provide an email address where we can reach you for updates  
email@example.com

I have read and agree to the following license agreements:  
[Terms](#)

**Create**      Add to estimate

IBM Cloud      Search resources and products...      Catalog      Manage      Nashit Human's Account

Base instance starts at 4 vCPU x 16 GB RAM x 20 GB Storage Uses dedicated virtual machines

\$0.314 USD/Virtual Processor Core-Hour  
\$0.000031 USD/BACKUP\_GIGABYTE\_HOURS  
\$0.10 USD/SERVICEENDPOINT\_INSTANCE\_HOURS

**Summary**

**Db2**      Free  
Location: London  
Plan: Lite  
Service name: Db2-6u  
Resource group: Default

Configure your resource

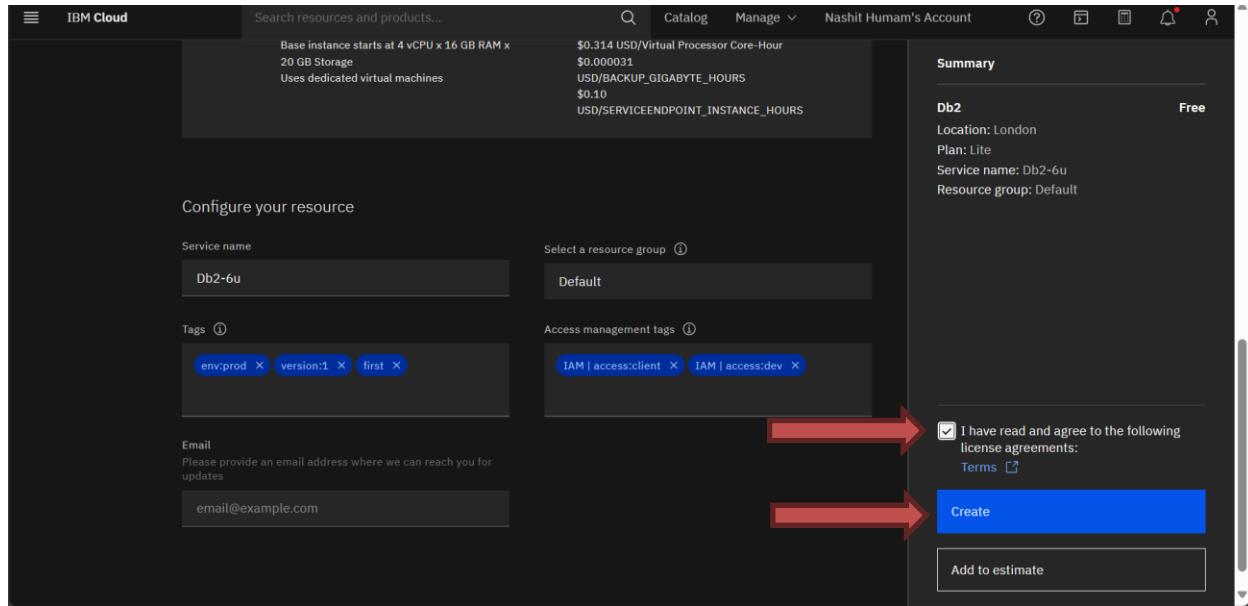
Service name: Db2-6u      Select a resource group: Default

Tags: env:prod × version:1 × first ×      Access management tags: IAM | access:client × IAM | access:dev ×

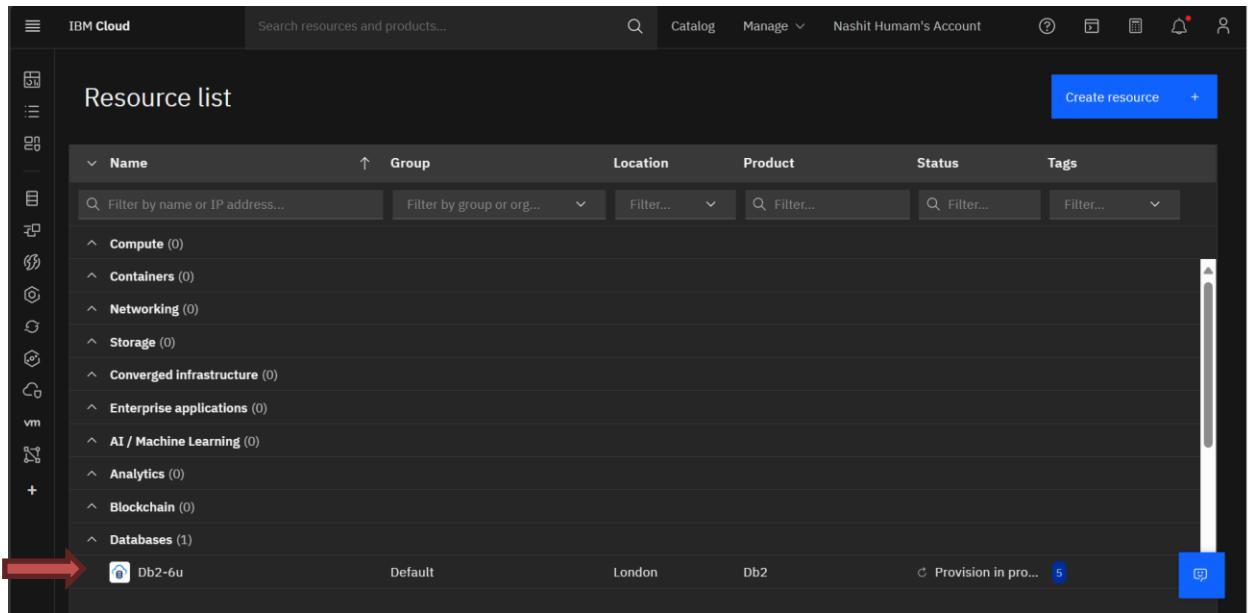
Email: Please provide an email address where we can reach you for updates  
email@example.com

I have read and agree to the following license agreements:  
[Terms](#)

**Create**      Add to estimate



Step 9: It redirects you to RESOURCES page, where you can find the resource, you just created which will take a few minutes of provisioning. Once provisioned, open the resource, you created.



Step 10: You are redirected to the RESOURCE page, and from here navigate to the UI, by clicking on “GO TO UI”, to be redirected to an OVERVIEW page

IBM Cloud

Resource list / Db2-6u Active env:prod first version:1 +2 ↗

Manage Getting started Service credentials Connections

Getting started

Where can I find my credentials? Get your username and password by clicking the "Service Credentials" link to the left and selecting "New Credentials". Don't see this menu on the left? Click on "Manage in IBM Cloud" to open the IBM Cloud dashboard.

Need help? Submit a IBM Cloud Support Case to our team.

Go to UI Getting started docs Support case

## Step 11: Navigate to DATA tab

IBM Db2 on Cloud

Overview In-flight executions Connections Table performance

Resource usage

Last 1 hour

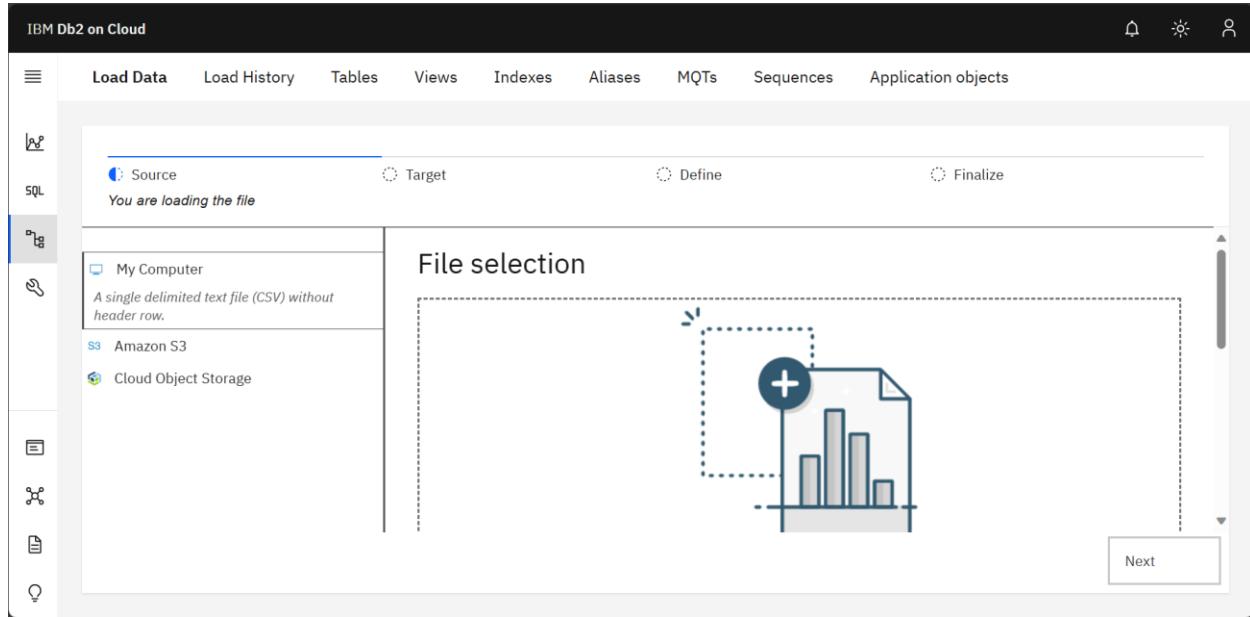
Data Storage (0M / 0M) current value

Storage usage (%)

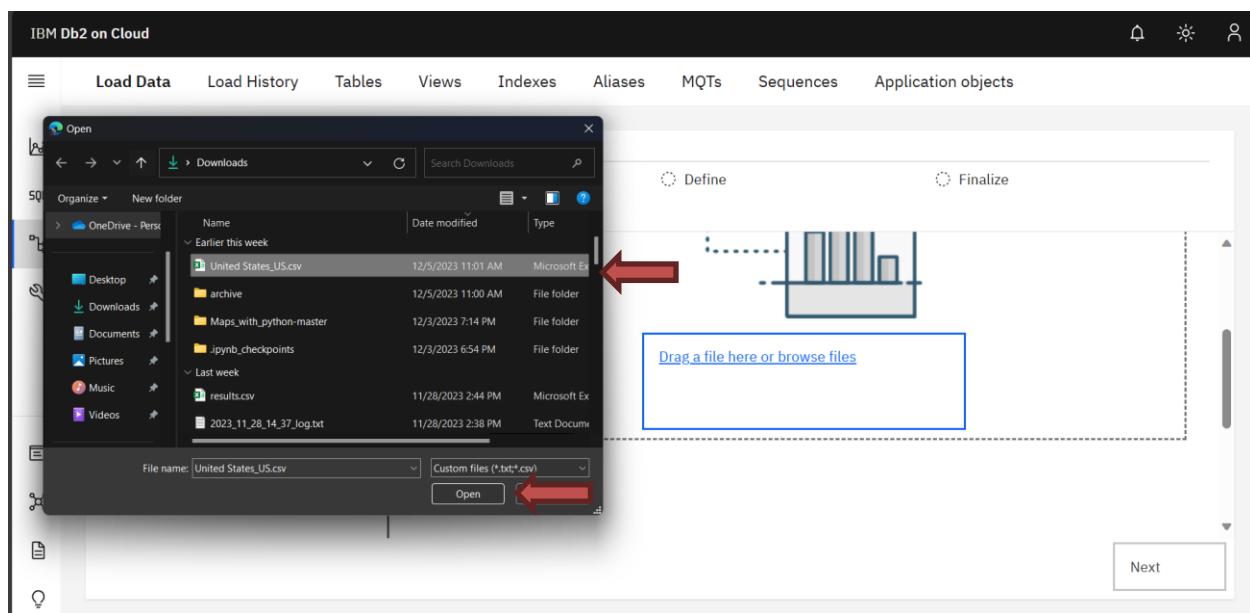
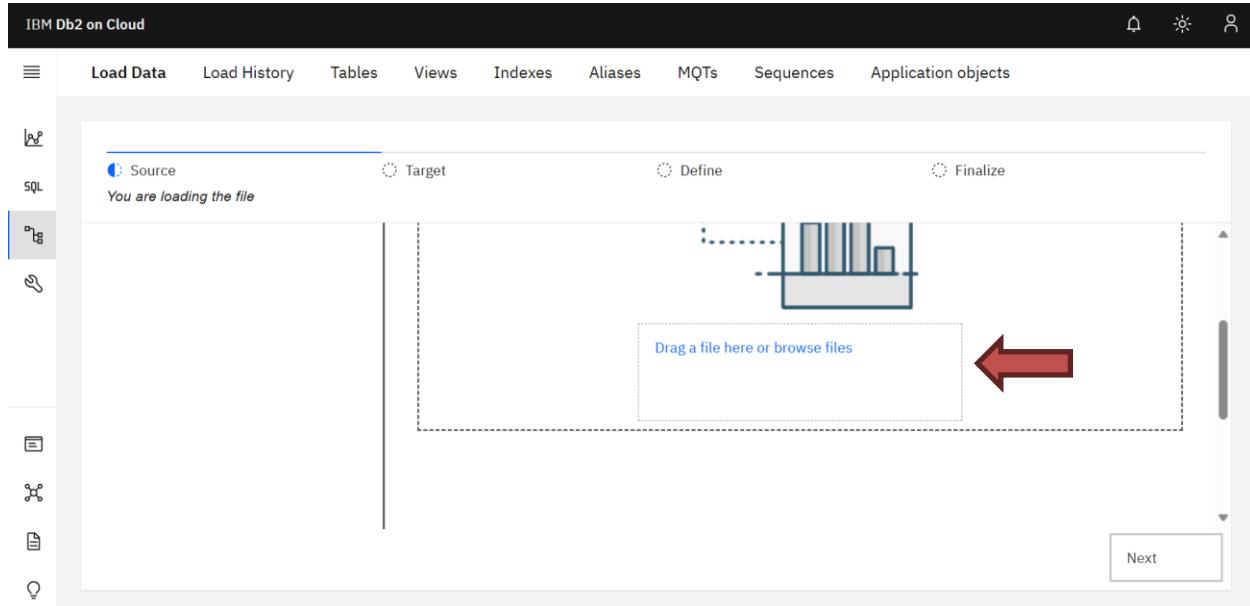
Time	Storage usage (%)
12:48 PM	0
01:00 PM	0
01:20 PM	0
01:40 PM	0
01:48 PM	0

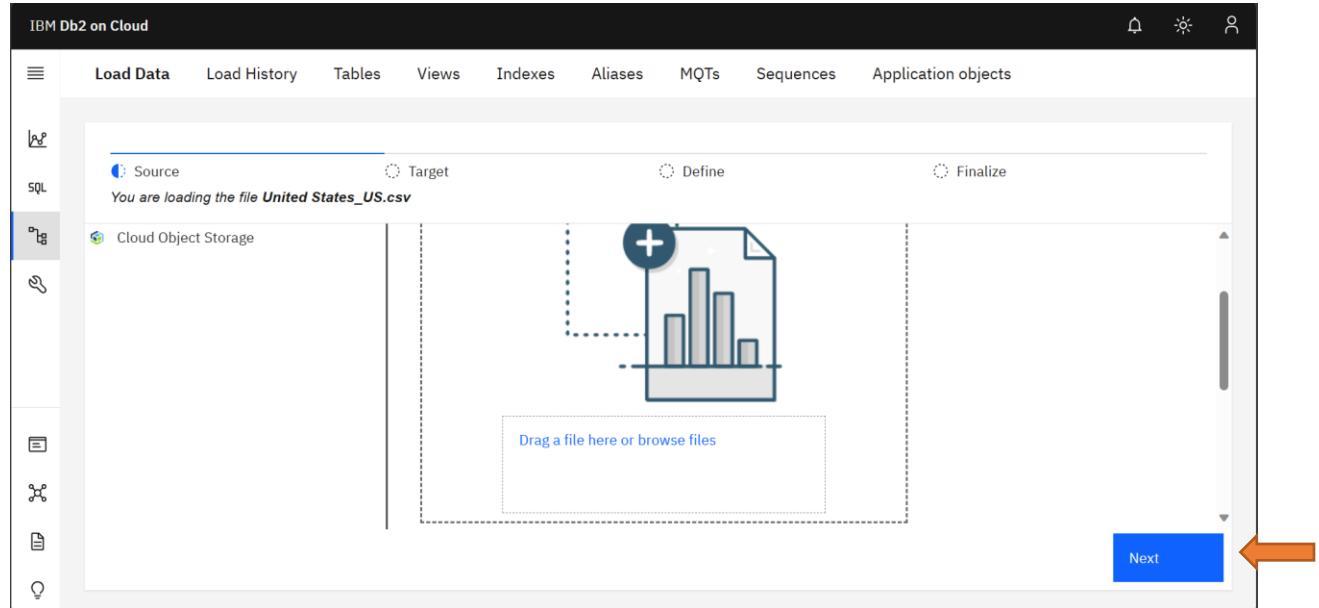
bs2ipcu0apon0jufl80lite.db2.cloud.ibm.com/.../index.html

Step 12: You might upload your data here. The schema would read the imported file and adjust accordingly. You would be allowed to import locally from your machine or from IBM Cloud storage & AWS S3.

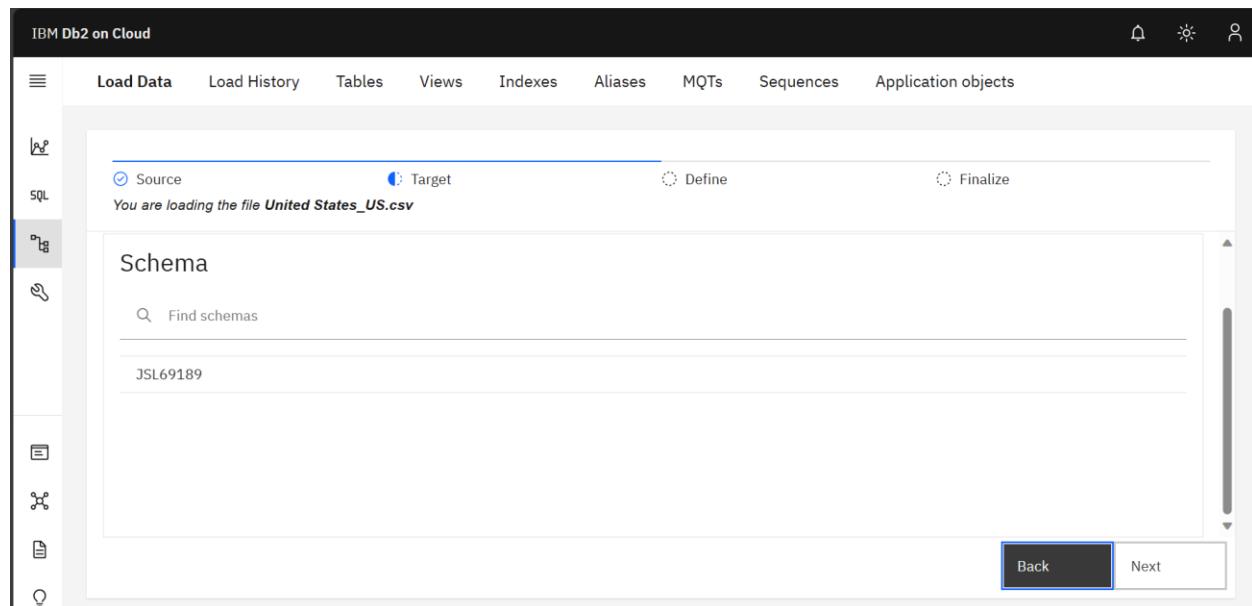


Step 13: Let's import from a local file. Scroll a little to drag files. We would select a local file, and open to upload.





Step 14: It would automatically check for the schema available. Select the schema to highlight the TABLES available.



IBM Db2 on Cloud

Load Data    Load History    Tables    Views    Indexes    Aliases    MQTs    Sequences    Application objects

Source    Target    Define    Finalize

You are loading the file United States\_US.csv

Schema

Find schemas

JSL69189

Back    Next

IBM Db2 on Cloud

Load Data    Load History    Tables    Views    Indexes    Aliases    MQTs    Sequences    Application objects

Source    Target    Define    Finalize

You are loading the file United States\_US.csv

Schema

Find schemas

JSL69189

Table

New table +

Find tables in JSL69189

ADIT

Back    Next

Step 15: Create a NEW TABLE. You would be prompted to provide a name to the table, the name can be any, like ADIT or NSTI, or anything, depending upon the need. I am adding the “NSTI”, and the CREATE button would be highlighted.

IBM Db2 on Cloud

Load Data   Load History   Tables   Views   Indexes   Aliases   MQTs   Sequences   Application objects

Source   Target   Define   Finalize

You are loading the file **United States\_US.csv**

**Schema**

Find schemas

JSL69189

**Table**

Find tables in JSL69189

ADIT

New table +

Back   Next

IBM Db2 on Cloud

Load Data   Load History   Tables   Views   Indexes   Aliases   MQTs   Sequences   Application objects

Source   Target   Define   Finalize

You are loading the file **United States\_US.csv**

**Schema**

Find schemas

JSL69189

**Table**

Find tables in JSL69189

ADIT

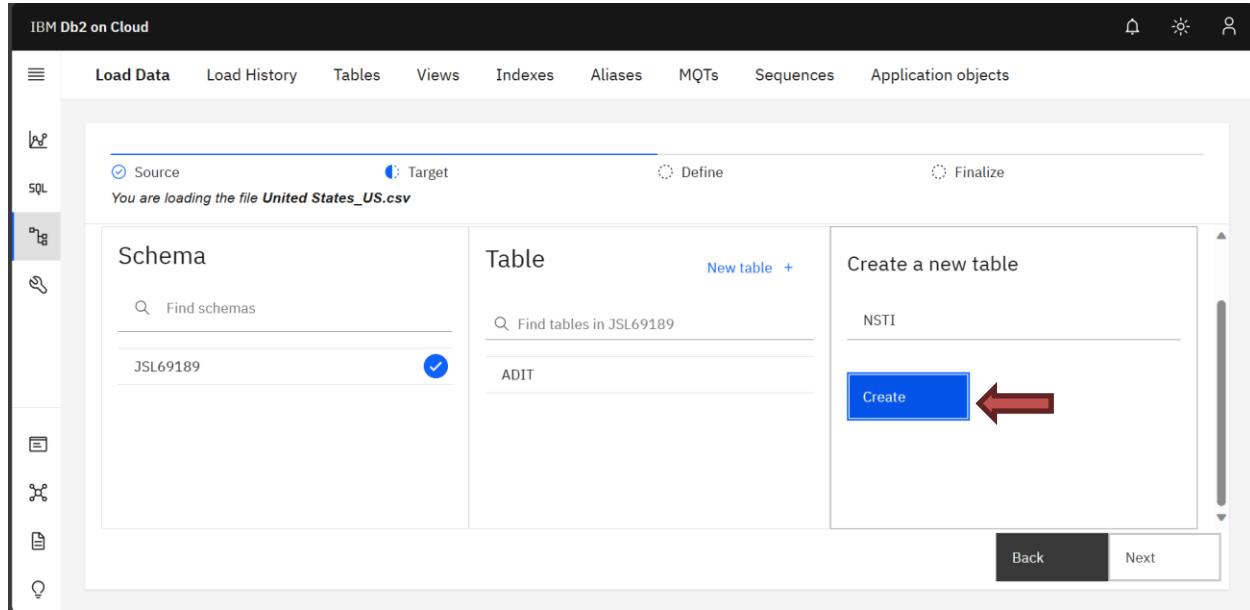
New table +

**Create a new table**

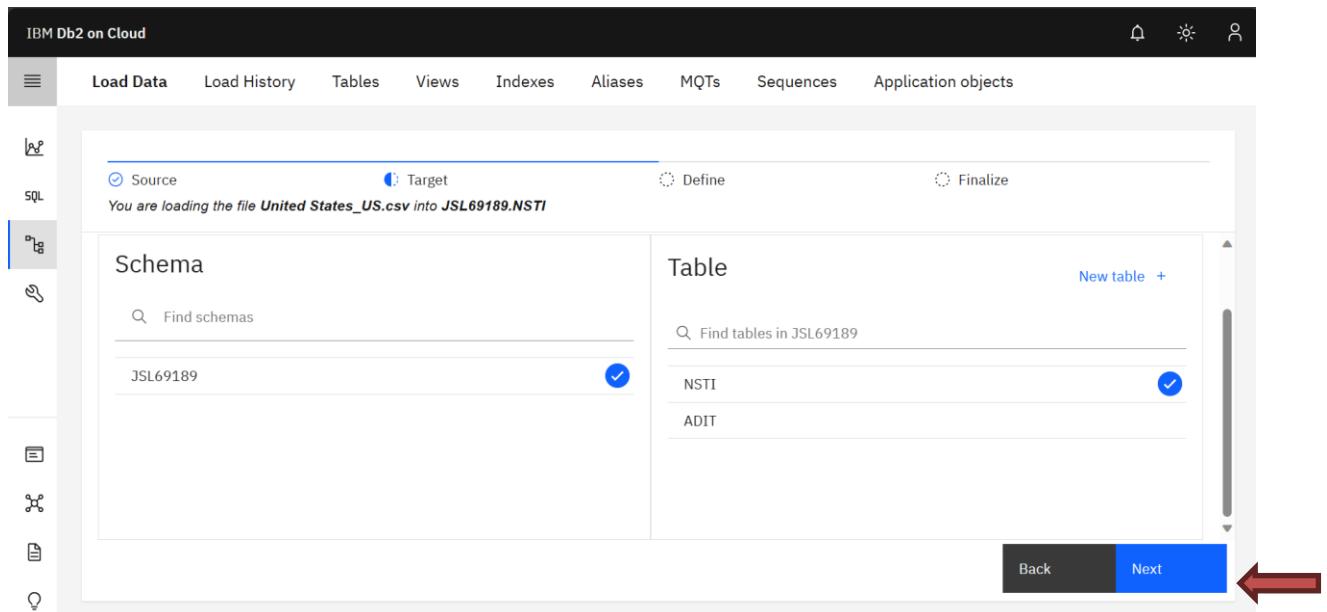
NSTI

Create

Back   Next



Step 16: The TABLE thus created would be highlighted, and the NEXT button would be activated. Click the NEXT button.



Step 17: This starts the import of the data. Select NEXT, and it prompts you to BEGIN LOAD.

IBM Db2 on Cloud

Load Data    Load History    Tables    Views    Indexes    Aliases    MQTs    Sequences    Application objects

Source    Target    Define    Finalize

You are loading the file **United States\_US.csv** into **JSL69189.NSTI**

Code page (character encoding): 1208 (UTF-8) Separator: , Header in first row:  Time & date format:  Detect data types:

Date format: YYYY-MM-DD Time format: HH:MM:SS Timestamp format: YYYY-MM-DD HH:MM:SS

	DATE	NAME	TYPE
	TIMESTAMP	VARCHAR(116)	VARCHAR(37)
1	1/1/2023	New Year's Day	[Local holiday]
2	1/1/2023	New Year's Day	[Local holiday]
3	1/1/2023	New Year's Day	[Local holiday]
4	1/1/2023	New Year's Day	[Local holiday]
5	1/1/2023	New Year's Day	[National holiday]

Back    Next

IBM Db2 on Cloud

Load Data    Load History    Tables    Views    Indexes    Aliases    MQTs    Sequences    Application objects

Source    Target    Define    Finalize

You are loading the file **United States\_US.csv** into **JSL69189.NSTI**

**Summary**

Code page: 1208 (Default)  
Separator: ,  
Time format: HH:MM:SS (Default)  
Date format: YYYY-MM-DD (Default)  
Timestamp format: YYYY-MM-DD HH:MM:SS (Default)  
String delimiter: (Default)

**Option**

Maximum number of warnings  
1000

Back    Begin Load




Step 18: This starts the LOAD process, that might take a few seconds to be ready. A few records might be dropped/rejected, owing to unclean data.

IBM Db2 on Cloud

Load Data Load History Tables Views Indexes Aliases MQTs Sequences Application objects

Load details

SQL UPLOADING My computer Target  
United States\_US.csv JSL69189.NSTI

Status Settings Errors 0 Warnings 0

Uploading 100% completed.  
Do not sign out of the console until the upload completes.

Did you know?  
When this load job is complete, you can download a log from this page for detailed information about the load.

Auto-create table  
Upload  
Load data

Available after load is finished

IBM Db2 on Cloud

Load Data Load History Tables Views Indexes Aliases MQTs Notifications Clear all

Load details

SQL ! WARNING 0 warning My computer Target  
United States\_US.csv JSL69189.NSTI

Status Errors 6 Warnings 0

632 Rows read 626 Rows loaded 6 Rows rejected

The data load job completed with errors.

Notifications

Load completed with minor error  
Load United States\_US.csv from My Computer to JSL69189.NSTI  
2023/12/08, 02:12 PM View details

Errors 6 Warnings 0

0180: The syntax of the string representation of a datetime value is incorrect. SQLSTATE=22007 (More info) Number of occurrences: 6

0180: The syntax of the string representation of a datetime value is incorrect. SQLSTATE=22007 (More info) Number of occurrences: 6

0180: The syntax of the string

Step 19: data has been imported. You might view the imported records by clicking on VIEW TABLE, to check the records.

IBM Db2 on Cloud

Load Data Load History Tables Views Indexes Aliases MQTs Sequences Application objects

Load details

SQL My computer Target United States\_US.csv JSL69189.NSTI

Status Settings

632 Rows read 626 Rows loaded 6 Rows rejected

The data load job completed with errors.

View Table Load More Data

Errors 6 Warnings 0

0180: The syntax of the string representation of a datetime value is incorrect. SQLSTATE=22007 (More info) Number of occurrences: 6

0180: The syntax of the string representation of a datetime value is incorrect. SQLSTATE=22007 (More info) Number of occurrences: 6

0180: The syntax of the string

IBM Db2 on Cloud

Load Data Load History Tables Views Indexes Aliases MQTs Sequences Application objects

JSL69189.NSTI

Back Export to CSV

	DATE TIMESTAMP(10)	NAME VARCHAR(116)	TYPE VARCHAR(37)	COUNTRY_NAME VARCHAR(13)	COUNTRY_CODE VARCHAR(2)
1	2023-01-01 00:00:00.0	New Year's Day	['Local holiday']	United States	US
2	2023-01-01 00:00:00.0	New Year's Day	['National holiday']	United States	US
3	2023-01-01 00:00:00.0	New Year's Day	['Local holiday']	United States	US
4	2023-01-01 00:00:00.0	New Year's Day	['Local holiday']	United States	US
5	2023-01-01 00:00:00.0	New Year's Day	['Local holiday']	United States	US
6	2023-01-02 00:00:00.0	New Year's Day (substitute)	['Local holiday']	United States	US
7	2023-01-02 00:00:00.0	New Year's Day (substitute)	['Local holiday']	United States	US
8	2023-01-02 00:00:00.0	New Year's Day (substitute)	['Local holiday']	United States	US

References: [IBM Db2](#)

## Activity 7

**Aim:** Bluemix with Cloudant

**Learning outcome:** Able to understand the Cloud, Architecture, App Development & Deployment in cloud environment.

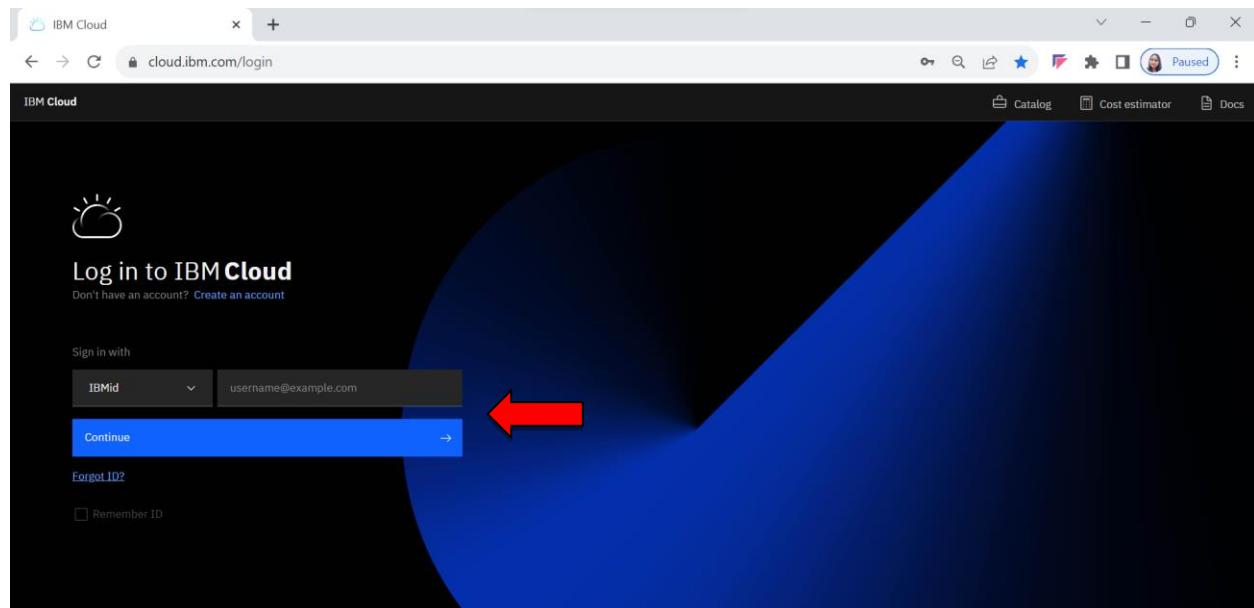
**Duration:** 7 hour

### List of Hardware/Software requirements:

1. Laptop/Desktop with windows 10/11
2. IBM Cloud Account

### Code/Program/Procedure (with comments):

1. Login on IBM Cloud Account with your Credentials.



2. Then you will see the Dashboard of IBM Cloud.

The screenshot shows the IBM Cloud dashboard with a sidebar on the left containing icons for Compute, Containers, Networking, Storage, Converged Infrastructure, Enterprise applications, AI / Machine Learning, Analytics, Blockchain, Databases, Developer tools, and Logging and monitoring. The main area displays several service tiles:

- Build**: Explore IBM Cloud with this selection of easy starter tutorials and services.
- Db2**: Get enterprise-level OLTP performance, 99.99% uptime SLA, automatic backups, compliance options and encryption at rest with Db2.
- Build with Watson**: Chatbots, insights, recognizers, and more. Explore the AI platform for business.
- Choose a Database**: Find the right IBM Cloud database for the job.
- Use Watson Studio**: Watson Studio provides a suite of tools and a collaborative environment for data scientists, developers and domain experts.
- Get Started with Watson Studio**: Get started with using AI and Cloud Object Storage in 15 minutes.

Below these tiles are sections for News, Recent support cases, Planned maintenance, and IBM Cloud status.

3. Now, First ensure to remove all resources from your current IBM Cloud Account.

The screenshot shows the Resource list page in IBM Cloud. A red arrow points to the "Resource list" header. The page features a sidebar on the left with the same resource categories as the dashboard. The main area is a table with columns: Name, Group, Location, Product, Status, and Tags. There are search and filter fields for each column. The "Name" column contains a dropdown menu with "Filter by name or IP address..." and other filter options. The "Group" column has a dropdown menu with "Filter by group or org...". The "Location", "Product", "Status", and "Tags" columns have "Filter..." buttons. The "Name" column also has a "Filter..." button.

#### 4. Search Cloudant and click on it

The screenshot shows the IBM Cloud dashboard with a search bar at the top containing 'cloudant'. Below the search bar, there is a 'Catalog Results' section. A red arrow points to the first result, which is 'Cloudant Service'. Other results listed include 'Database', 'Use Watson Studio', 'Get Started with Watson Studio', and 'IBM Cloud status'. The left sidebar has a 'Dashboard' section with a 'For you' card and a 'Build' section with various links. At the bottom of the dashboard, there is a news card and a footer with a URL: <https://cloud.ibm.com/catalog/services/cloudant>.

#### 5. Select available region: choose Frankfurt

Select an offering

**Cloudant**

IBM Cloudant is a fully managed JSON document database that offers independent serverless scaling of throughput capacity and storage.

Lite plan available

Select an environment

Multitenant  Dedicated

Your instance will be running securely on environments with shared resources.

Available regions

- Frankfurt
- Chennai
- Dallas
- Frankfurt
- London

16°C Smoke

Cloudant - IBM Cloud

cloud.ibm.com/catalog/services/cloudant

Catalog Manage Deepika Singh's Account

**Summary**

Offering	Plan	Type	Status
Cloudant Lite	Free	Free	Free Included
	20 Reads/sec		
	10 Writes/sec		
	5 Global Queries/sec		
	1 GB Storage		

Create Add to estimate

## 6. Name your cloudant or you can go with the Default one

Instance name: Cloudant-05

Resource group: Default

Tags: Examples: env:dev, version-1

Authentication method: IAM

Plan:

- Lite**
- Standard**

Lite: Full functionality for development and evaluation with a set capacity. Only one Lite plan instance per account.  
Standard: Granular control over provisioned throughput capacity allocated. Billing prorated hourly.

Capacity:

- 20 Reads
- 10 Writes
- 5 Queries
- 1 GB Storage

Cloudant - IBM Cloud

cloud.ibm.com/catalog/services/cloudant

Catalog Manage Deepika Singh's Account

**Summary**

Offering	Plan	Type	Status
Cloudant Lite	Free	Free	Free Included
	20 Reads/sec		
	10 Writes/sec		
	5 Global Queries/sec		
	1 GB Storage		

Create Add to estimate

## 7. Click on Create

The screenshot shows the IBM Cloud Catalog interface. In the center, there's a modal window with the title "Service created" and the message "The service might take time to provision. You are being redirected to the resource list now." To the right of the modal, a red arrow points to a "Create" button on a card for "Cloudant Lite". The card also includes details like "20 Reads/sec", "10 Writes/sec", "5 Global Queries/sec", and "1 GB Storage". On the left, there are sections for "Plan" (Lite and Standard), "Capacity", and usage metrics: 20 Reads, 10 Writes, 5 Queries, and 1 GB Storage.

## 8. Cloudant is created.

The screenshot shows the IBM Cloud Resource list. On the left, there's a sidebar with various service categories like Containers, Networking, Storage, etc. A red arrow points to the "Containers" section where "Cloudant-05" is listed. The main table lists the resource details: Name (Cloudant-05), Group (Default), Location (Frankfurt), Product (Cloudant), Status (Active), and Tags (None). A blue "Create resource" button is visible at the top right of the table area.

## 9. Now your cloudant is in active state. Now you are able to see the cloudant.

Service Details - IBM Cloud

Resource list / Cloudant-05 Active Add tags ↗

IBM Cloud Search resources and products... Catalog Manage Deepika Singh's Account

Manage Overview Capacity Docs Launch Dashboard ↗

Service credentials Plan Connections

Deployment details

CRN crn:v1:bluemix:public:cloudantnosqldb:eu-de:a/a98cb1a1c23d46a9bd754336c04079a6:5cc7d0b0-8c97-4777-b557-2a615226a09e: Location Frankfurt

External endpoint https://eb9f3ed9-ae19-42ee-b825-7419e6bdff22-bluemix.cloudant.com ↗ External endpoint (preferred) https://eb9f3ed9-ae19-42ee-b825-7419e6bdff22-bluemix.cloudantnosqldb.appdomain.cloud ↗ Authentication methods IBM Cloud IAM ↗

Activity Tracker event types Management Save

Disk encryption Yes. Automatically generated disk encryption key.

Capacity details

16°C Smoke Search ENG IN 11:22 11-12-2023

#### 10. Click on “Service Credential”.

Service Details - IBM Cloud

Resource list / Cloudant-05 Active Add tags ↗

IBM Cloud Search resources and products... Catalog Manage Deepika Singh's Account

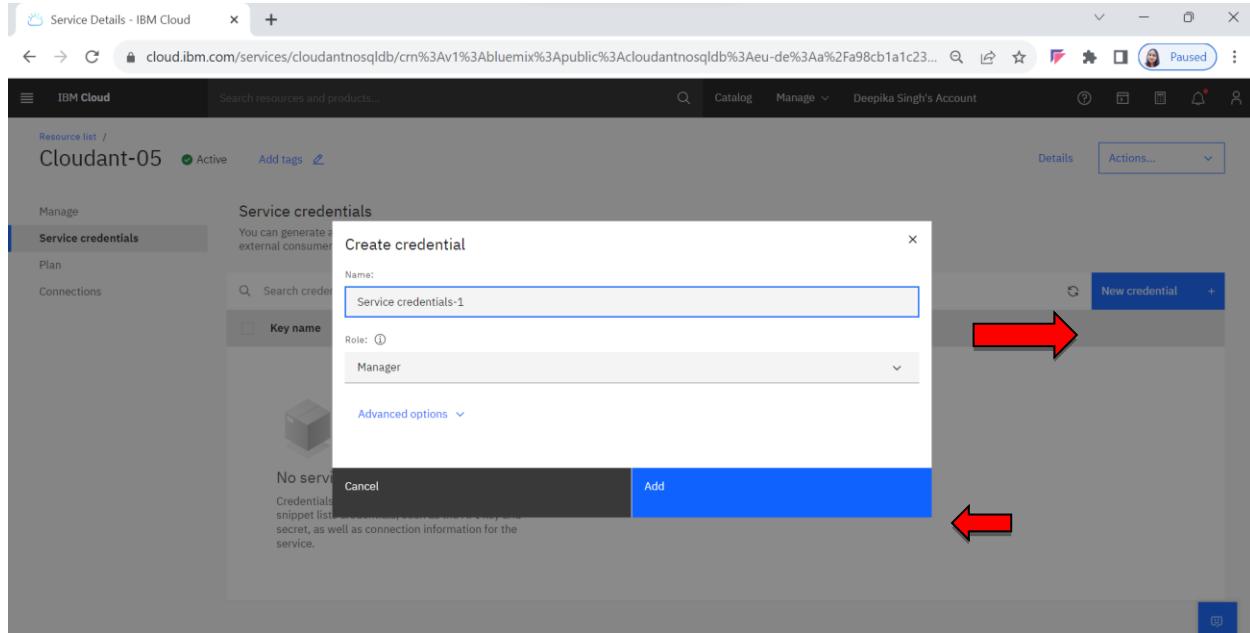
Manage Service credentials Plan Connections

Service credentials You can generate a new set of credentials for cases where you want to manually connect an app or external consumer to an IBM Cloud service. [Learn more](#)

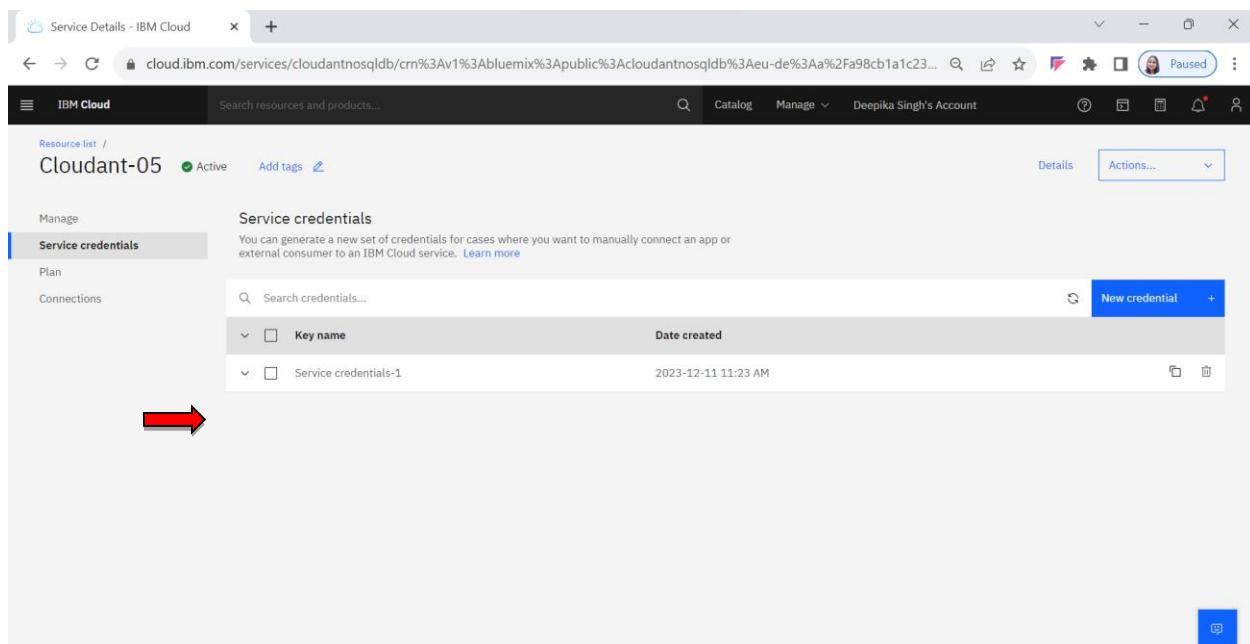
New credential +

No service credentials Credentials are provided in JSON format. The JSON snippet lists credentials, such as the API key and secret, as well as connection information for the service.

#### 11. Click on “New Credential” & click on “ADD”.



12. You will be able to see the created Credential.



13. The new credential is added. Now expand the service credential

Service Details - IBM Cloud

Cloudant-05 Active Add tags

Resource list /

Manage Service credentials Plan Connections

Service credentials

You can generate a new set of credentials for cases where you want to manually connect an app or external consumer to an IBM Cloud service. [Learn more](#)

1 item selected

Key name	Date created
Service credentials-1	2023-12-11 11:23 AM

```
{
  "apikey": "tyFHWufkHZBa9Mj7xmZMm23083KE9awLitUqGDPN0Euo",
  "host": "eb9f3ed9-ae19-42ee-b825-7419e6bdff22-bluemix.cloudantnosql.db.appdomain.cloud",
  "iam_apikey_description": "Auto-generated for key crn:v1:bluemix:public:cloudantnosql:eu-de:a/a98cb1a1c23d46a9bd754336c04079a6:resource-key:84c69c1e-df48-4e33-a052-1e8001527d0b",
  "iam_apikey_id": "ApiKey-0c90902c-c615-4ccb-b382-216146b839e5",
  "iam_apikey_name": "Service credentials-1",
  "iam_role_crn": "crn:v1:bluemix:public:iam::::serviceRole:Manager",
  "iam_serviceid_crn": "crn:v1:bluemix:public:iam-identity:a/a98cb1a1c23d46a9bd754336c04079a6:serviceid:ServiceId-ebfdfb79-231d-4011-b60d-dh5698242909",
  "url": "https://eb9f3ed9-ae19-42ee-b825-7419e6bdff22-bluemix.cloudantnosql.db.appdomain.cloud",
  "username": "eb9f3ed9-ae19-42ee-b825-7419e6bdff22-bluemix"
}
```

#### 14. Now copy the URL

Service Details - IBM Cloud

Cloudant-05 Active Add tags

Resource list /

Manage Service credentials Plan Connections

Service credentials

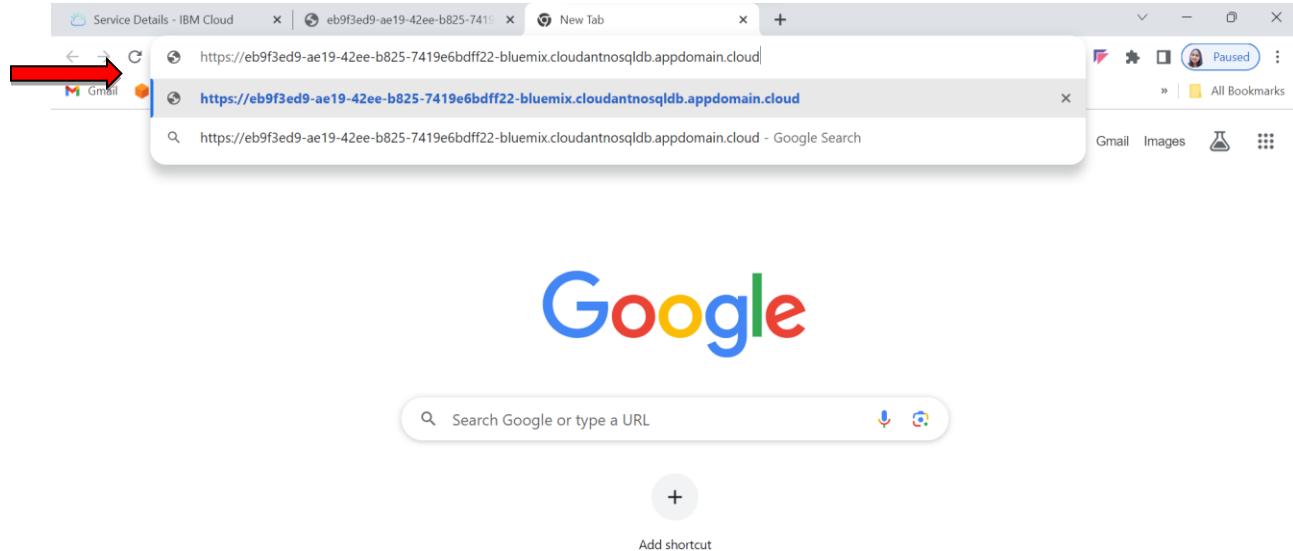
You can generate a new set of credentials for cases where you want to manually connect an app or external consumer to an IBM Cloud service. [Learn more](#)

1 item selected

Key name	Date created
Service credentials-1	2023-12-11 11:23 AM

```
{
  "apikey": "tyFHWufkHZBa9Mj7xmZMm23083KE9awLitUqGDPN0Euo",
  "host": "eb9f3ed9-ae19-42ee-b825-7419e6bdff22-bluemix.cloudantnosql.db.appdomain.cloud",
  "iam_apikey_description": "Auto-generated for key crn:v1:bluemix:public:cloudantnosql:eu-de:a/a98cb1a1c23d46a9bd754336c04079a6:resource-key:84c69c1e-df48-4e33-a052-1e8001527d0b",
  "iam_apikey_id": "ApiKey-0c90902c-c615-4ccb-b382-216146b839e5",
  "iam_apikey_name": "Service credentials-1",
  "iam_role_crn": "crn:v1:bluemix:public:iam::::serviceRole:Manager",
  "iam_serviceid_crn": "crn:v1:bluemix:public:iam-identity:a/a98cb1a1c23d46a9bd754336c04079a6:serviceid:ServiceId-ebfdfb79-231d-4011-b60d-dh5698242909",
  "url": "https://eb9f3ed9-ae19-42ee-b825-7419e6bdff22-bluemix.cloudantnosql.db.appdomain.cloud", ←
  "username": "eb9f3ed9-ae19-42ee-b825-7419e6bdff22-bluemix"
}
```

#### 15. Open a new tab and paste the URL in the browser. The final screen is as follow, from this we have to copy the url path:



## Output/Results snippet:



## References:

- <https://www.ibm.com/products/cloudant>
- <https://cloud.ibm.com/catalog/services/cloudant>

## Activity 8

**Aim:** Convert text to speech in IBM Cloud

**Learning outcome:** Able to understand the Cloud, Architecture, App Development & Deployment in cloud environment.

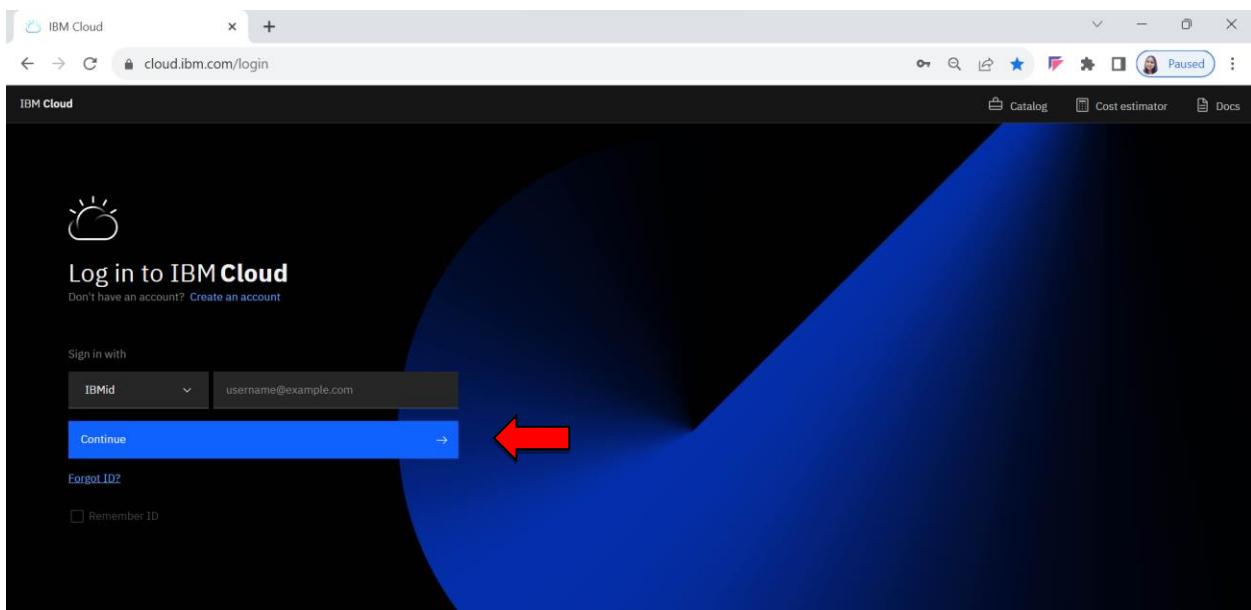
**Duration:** 5 hour

### List of Hardware/Software requirements:

3. Laptop/Desktop with windows 10/11
4. IBM Cloud Account

### Code/Program/Procedure (with comments):

1. Login on IBM Cloud Account with your Credentials.



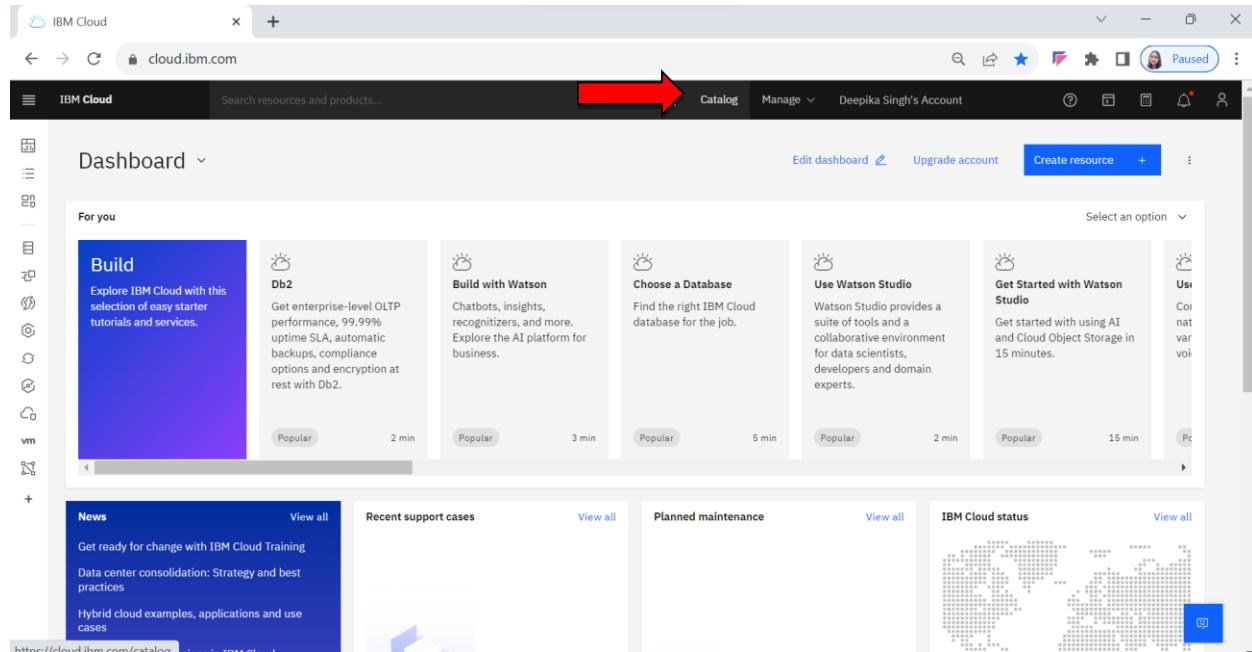
2. Then you will see the Dashboard of IBM Cloud.

The screenshot shows the IBM Cloud dashboard with a sidebar containing icons for Compute, Containers, Networking, Storage, Converged Infrastructure, Enterprise applications, AI / Machine Learning, Analytics, Blockchain, Databases, Developer tools, and Logging and monitoring. The main area displays tiles for 'For you' services: Build, Db2, Build with Watson, Choose a Database, Use Watson Studio, Get Started with Watson Studio, News, Recent support cases, Planned maintenance, and IBM Cloud status.

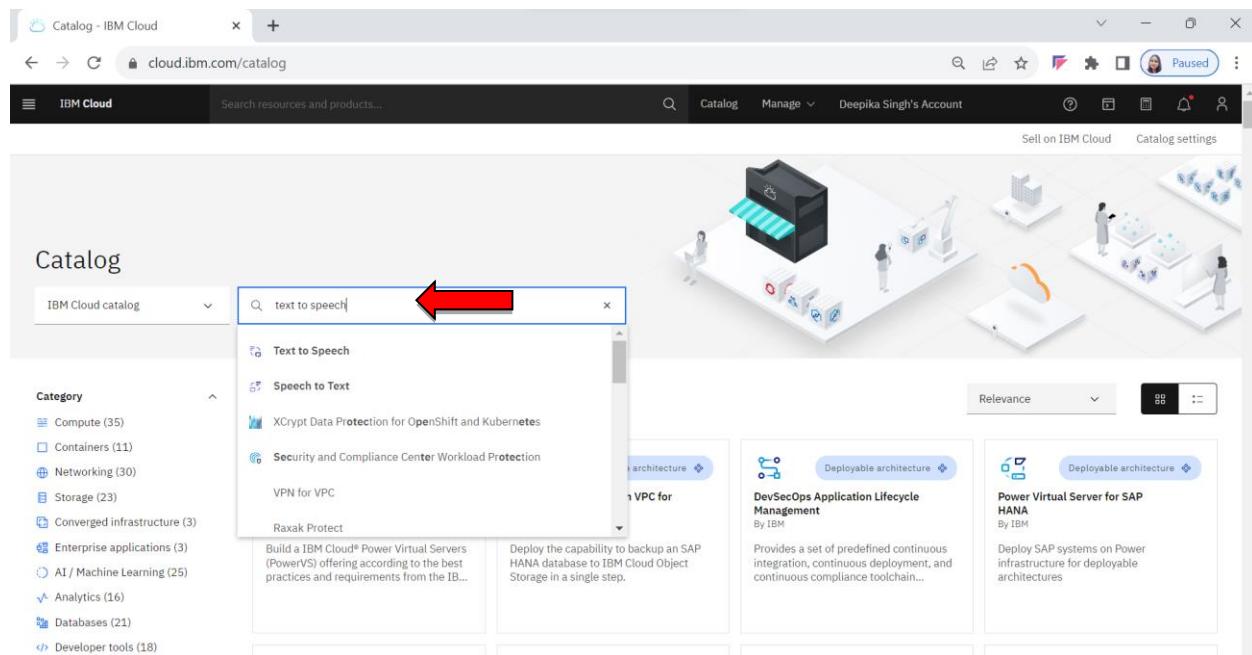
3. Now, First ensure to remove all resources from your current IBM Cloud Account.

The screenshot shows the IBM Cloud Resource list page. The sidebar includes icons for Compute, Containers, Networking, Storage, Converged Infrastructure, Enterprise applications, AI / Machine Learning, Analytics, Blockchain, Databases, Developer tools, and Logging and monitoring. The main content area displays a table with columns: Name, Group, Location, Product, Status, and Tags. The 'Group' column shows categories like Compute, Containers, Networking, Storage, etc., each with a count of 0 in parentheses. The 'Name' column lists individual resources under these groups.

4. Click on Catalog



## 5. Search text to speech from the catalog



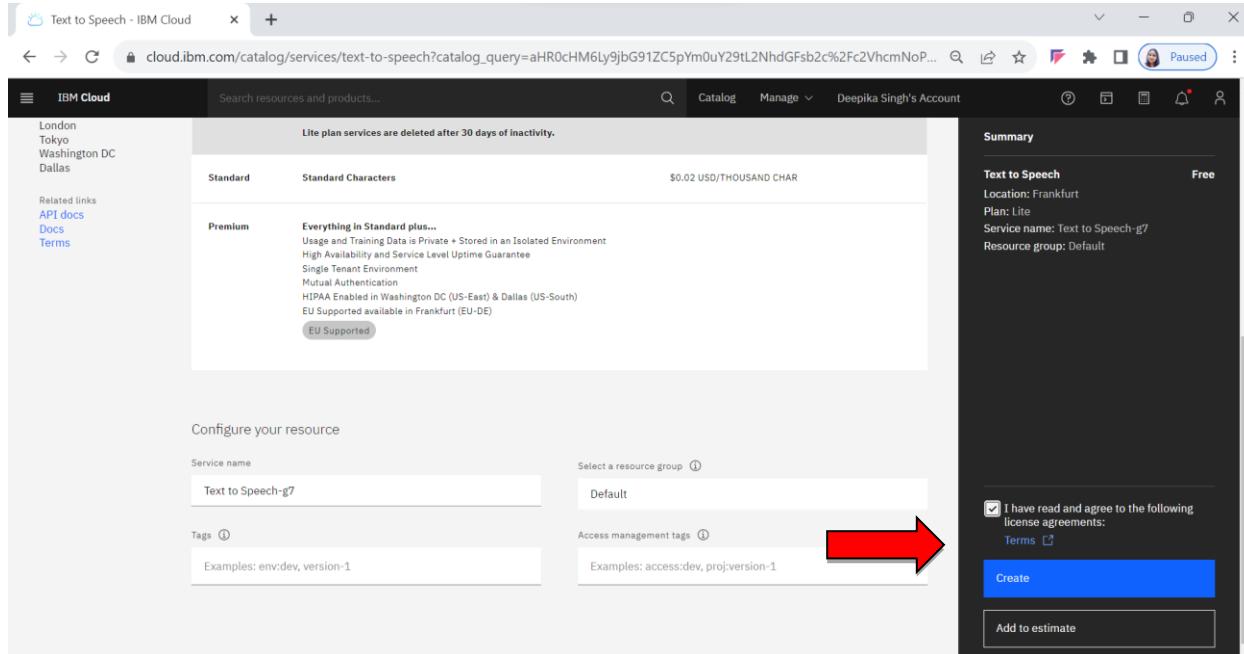
## 6. Click on Text to speech

The screenshot shows the IBM Cloud Catalog interface. A red arrow points to the 'Text to Speech' service card, which is highlighted with a blue border. The service card includes a description: 'Synthesizes natural-sounding speech from text.', its provider 'By IBM', and its status as 'Free'. Other services listed include 'Secrets Manager', 'Secure Gateway', 'Security and Compliance Center', 'Speech to Text', 'Streaming Analytics', 'Toolchain', and 'Security and Compliance Center Workload Protection'.

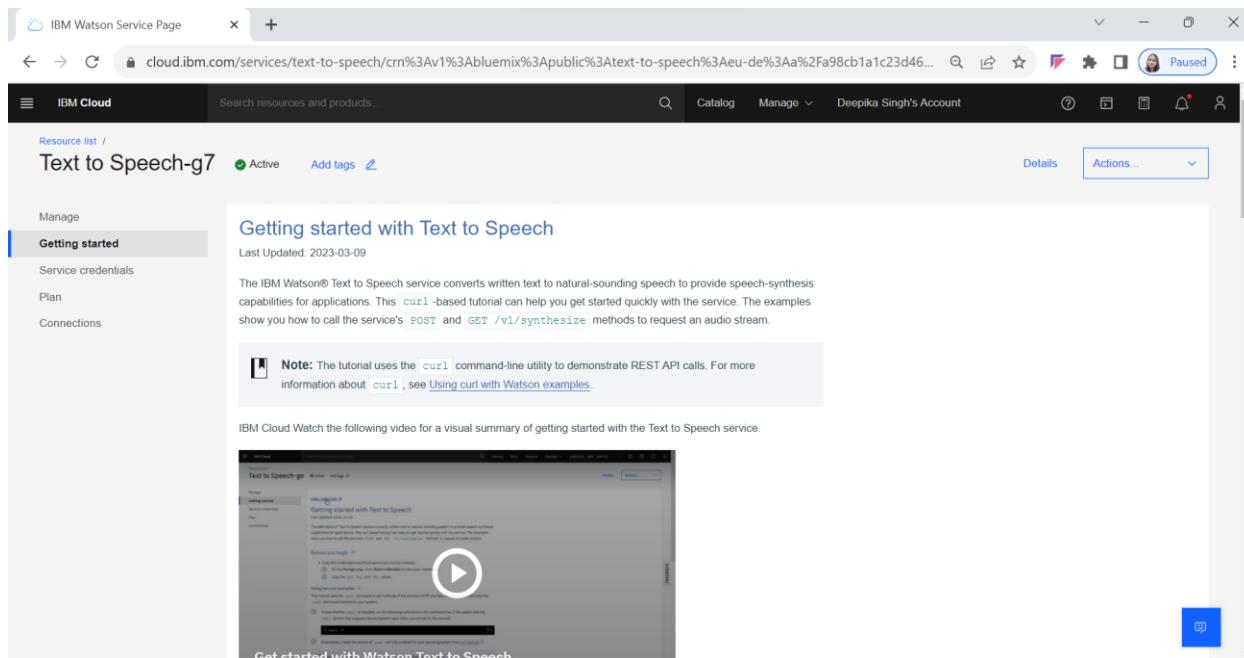
7. Now you can create synthesizes natural sounding speech from text, Select a Location: **Frankfurt(eu-gb)**, Configure your resource.

The screenshot shows the 'Text to Speech' service configuration page. A red arrow points to the 'Create' button at the top left. Another red arrow points to the 'Location' dropdown menu where 'Sydney (au-syd)' is selected. On the right side, there is a 'Summary' panel showing the service details: 'Text to Speech', 'Location: Sydney', 'Plan: Lite', 'Service name: Text to Speech-g7', and 'Resource group: Default'. At the bottom, there is a checkbox for license agreements and a 'Create' button.

8. Click on the checkbox to create a resource. Now Click on Create.



## 9. Now you will be able to see this interface.



## 10. Now scroll down and Go to the Next Steps, Click on Text to Speech Demo.

IBM Watson Service Page    Watson Text to Speech Demo

Search resources and products    Catalog    Manage    Deepika Singh's Account

Issue the following command to synthesize the string "hola mundo" and produce a WAV file that is named `hola_mundo.wav`.

```
$ curl -X GET -u "apikey:(apikey)" \
--output hola_mundo.wav \
"(url)/vi/synthesize?accept=audio%2Fwav&text=hola%20mundo&voice=es-ES_Enrique"
```

IBM Cloud Pak for Data

- Replace `{token}` and `{url}` with the access token and URL for your service instance.

```
$ curl -X POST \
--header "Authorization: Bearer {token}" \
--output hola_mundo.wav \
"(url)/vi/synthesize?accept=audio%2Fwav&text=hola%20mundo&voice=es-ES_Enrique"
```

Next steps →

- To try an example application that accepts text and generates speech with different voices, see the [Text to Speech demo](#).
- For more information about the service's interfaces and features, see [Service features](#).
- For more information about all methods of the service's interfaces, see the [API & SDK reference](#).

<https://www.ibm.com/demos/live/tts-demo/self-service/home>

## 11. Now your IBM Watson Text to Speech Demo page will be appear.

IBM Watson Service Page    Watson Text to Speech Demo

IBM Watson Text to Speech Demo

Interested in Watson Text to Speech? [Get Started on IBM Cloud](#)

### Watson Text to Speech Voices

Listen to voices across languages and dialects

Language	Dialect	Enhanced neural voice
English	British	Charlotte

Use the sample text or enter your own text in English

Conscious of its spiritual and moral heritage, the Union is founded on the indivisible, universal values of human dignity, freedom, equality and solidarity; it is based on the principles of democracy and the rule of law. It places the individual at the heart of its activities, by establishing the citizenship of the Union and by creating an area of freedom, security and justice.

Adjust speed    Adjust pitch    Play voice

What is a Neural Voice?

By using Deep Neural Networks trained on human speech, Watson can produce natural-sounding and smooth voice quality.

[Learn more](#) about the science behind the service

Custom Voice Training

To distinguish your brand, work with IBM to train a voice that suits your distinct style with as little as one hour of audio.

[Learn more](#) about creating custom voices

Tune Neural Voices by Example

## 12. Now you can use the sample text or you can put your own text.

Watson Text to Speech Voices

Listen to voices across languages and dialects

Language: English      Dialect: British      Enhanced neural voice: Charlotte

Use the sample text or enter your own text in English

Good Morning Everyone!!  
Welcome to the Advance Diploma in IT Networking and Cloud Computing diploma program.

Adjust speed: 0.2x      Adjust pitch: 0%      Play voice

13. Now if you want to change the Language then Select it from the dropdown.

Watson Text to Speech Voices

Listen to voices across languages and dialects

Language: English      Dialect: British      Enhanced neural voice: Charlotte

Use the sample text or enter your own text in English

Good Morning Everyone!!  
Welcome to the Advance Diploma in IT Networking and Cloud Computing diploma program.

Adjust speed: 0.2x      Adjust pitch: 0%      Play voice

14. Now you can change the dialect also from the dropdown.

The screenshot shows the Watson Text to Speech Demo interface. On the left, there are dropdown menus for Language (English), Dialect (British), and Enhanced neural voice (Charlotte). A red arrow points to the 'Enhanced neural voice' dropdown menu, which is open and displays options: Charlotte, Kate, and James. Below these dropdowns is a text input field containing sample text: "Good Morning Everyone!! Welcome to the Advance Diploma in IT Networking and Cloud Computing diploma program." At the bottom of the interface are sliders for Adjust speed (0.2x to 1.7x) and Adjust pitch (0% to 100%), and a blue 'Play voice' button.

What is a Neural Voice?  
By using Deep Neural Networks trained on human speech, Watson can produce natural-sounding and smooth voice quality.  
[Learn more](#) about the science behind the service

Custom Voice Training  
To distinguish your brand, work with IBM to train a voice that suits your distinct style with as little as one hour of audio.  
[Learn more](#) about creating custom voices

Tune Neural Voices by Example  
Use your own voice to adjust for

### 15. Change Enhanced neural voice as per your choice.

This screenshot is identical to the previous one, showing the Watson Text to Speech Demo interface. The Enhanced neural voice dropdown menu is open, displaying Charlotte, Kate, and James. A red arrow points to the blue 'Play voice' button at the bottom right of the interface.

What is a Neural Voice?  
By using Deep Neural Networks trained on human speech, Watson can produce natural-sounding and smooth voice quality.  
[Learn more](#) about the science behind the service

Custom Voice Training  
To distinguish your brand, work with IBM to train a voice that suits your distinct style with as little as one hour of audio.  
[Learn more](#) about creating custom voices

Tune Neural Voices by Example  
Use your own voice to adjust for

### 16. After the changes Click on the Play Voice button.

IBM Watson Service Page    Watson Text to Speech Demo    ibm.com/demos/live/tts-demo/self-service/home

IBM Watson Text to Speech Demo    Interested in Watson Text to Speech? Get Started on IBM Cloud

## Watson Text to Speech Voices

Listen to voices across languages and dialects

Language: English    Dialect: British    Enhanced neural voice: Charlotte

Use the sample text or enter your own text in English

Good Morning Everyone!!  
Welcome to the Advance Diploma in IT Networking and Cloud Computing diploma program.

Adjust speed: 0.2x    Adjust pitch: 0%    Play voice

What is a Neural Voice?  
By using Deep Neural Networks trained on human speech, Watson can produce natural-sounding and smooth voice quality.  
[Learn more](#) about the science behind the service

Custom Voice Training  
To distinguish your brand, work with IBM to train a voice that suits your distinct style with as little as one hour of audio.  
[Learn more](#) about creating custom voices

Tune Neural Voices by Example  
Use your own voice to adjust for

FEEDBACK

## Output/Results snippet:

IBM Watson Service Page    Watson Text to Speech Demo    ibm.com/demos/live/tts-demo/self-service/home

IBM Watson Text to Speech Demo    Interested in Watson Text to Speech? Get Started on IBM Cloud

## Watson Text to Speech Voices

Listen to voices across languages and dialects

Language: English    Dialect: British    Enhanced neural voice: Charlotte

Use the sample text or enter your own text in English

Good Afternoon Everyone  
Welcome to the Advanced Diploma in IT Networking and Cloud Computing Diploma Program.

Adjust speed: 0.2x    Adjust pitch: 0%    Play voice

What is a Neural Voice?  
By using Deep Neural Networks trained on human speech, Watson can produce natural-sounding and smooth voice quality.  
[Learn more](#) about the science behind the service

Custom Voice Training  
To distinguish your brand, work with IBM to train a voice that suits your distinct style with as little as one hour of audio.  
[Learn more](#) about creating custom voices

Tune Neural Voices by Example

FEEDBACK

**References:**

- <https://www.ibm.com/products/text-to-speech>
- <https://cloud.ibm.com/catalog/services/text-to-speech>
- <https://cloud.ibm.com/docs/text-to-speech?topic=text-to-speech-gettingStarted>

## Activity 9

**Aim:** Perform operations on data using IBM Cloud Data Engine.

**Learning outcome:** Able to understand the Cloud, Architecture, App Development & Deployment in cloud environment.

**Duration:** 2 hours

### List of Hardware/Software requirements:

5. Laptop / Desktop with windows 10
6. Internet

### Code/Program/Procedure (with comments):

#### 11. Go to Catalog

The screenshot shows the IBM Cloud dashboard at <https://cloud.ibm.com>. A green arrow points to the 'Catalog' tab in the top navigation bar. The dashboard features a 'Dashboard' section with various cards for 'Build', 'Db2', 'Build with Watson', 'Use Watson Studio', 'Build a virtual machine', and 'Choose a Database'. Below this is a news section, recent support cases, planned maintenance, and an IBM Cloud status map.

## 12. Search for Data Engine(previously SQL Query). Click on it.

The screenshot shows the IBM Cloud Catalog interface. On the left, there are filters for 'Works with' (Satellite Enabled), 'Provider' (IBM, Anon Technology, Inc., Cerebral Blue LLC, Cloud Raxak, Inc., CyberSaint Security, First National Technology Solutions), 'Pricing plan' (Lite, Free), and 'Compliance' (EU Supported). The main area displays several service cards. One card for 'Data Engine (previously SQL Query)' is highlighted with a green border and a green arrow pointing to it. The card contains the service name, provider (By IBM), a brief description ('Read, analyze, store and stream data in Cloud Object Storage with ANSI SQL. Manage table metadata in a Hive metastore compatible catalog.'), and its status ('Free • IAM-enabled • Third party supported'). Other visible services include CyberStrong by CyberSaint, DataStage, Db2, Direct Link Connect, Event Notifications, and Data Replication.

## 13. Select Location – Default (Dallas us-South) and Lite Pricing Plan.

The screenshot shows the detailed view of the 'Data Engine (previously SQL Query)' service. On the left, there are sidebar filters for Provider (IBM), Last updated (12/05/2022), Category (Databases), and Compliance (IAM-enabled). The main content area has tabs for 'Create' (selected) and 'About'. The 'Create' tab includes a 'Select a location' section with a dropdown menu showing 'Dallas (us-south)' under 'Region' (with a green arrow pointing to it). Below the dropdown, there are sections for 'Lite' and 'Standard' pricing plans. The 'Lite' plan is selected, with a green arrow pointing to the 'Pricing' section. The 'Lite' plan details include: 'Scan up to 30 GB/day', 'Allows for one query at a time and no queued queries', 'Queries prioritized behind Standard plan queries', and 'The Lite plan provides access to the main functionality of IBM Cloud Data Engine for development and evaluation. Constraints align around concurrency, data volume scanned per day, priority of queries, catalog and streaming features.' At the bottom, it says 'Lite plan services are deleted after 30 days of inactivity.' To the right, there is a 'Summary' panel with service details like 'Data Engine (previously SQL Query)', 'Estimate costs', 'Location: Dallas', 'Plan: Lite', 'Service name: Data Engine -ADIT', and 'Resource group: Default'. There is also a checkbox for 'I have read and agree to the following license agreements: Terms' and buttons for 'Create' and 'Add to estimate'.

14. Enter a unique **Service name**. Let other fields remain as it. Move on the right bottom of the page and **check on the license agreements** and Click on **Create**.

The screenshot shows the IBM Cloud Data Engine creation interface. On the left, there are two plan options: 'Lite' and 'Standard'. The 'Lite' plan allows scanning up to 30 GB/day. The 'Standard' plan allows unlimited data scanned per month. On the right, the 'Summary' section displays the selected service name 'Data Engine -ADIT', location 'Dallas', and resource group 'Default'. At the bottom right, there is a 'Create' button, which is highlighted with a green arrow. A second green arrow points to the 'Service name' input field, which contains the value 'Data Engine -ADIT'.

15. If you want to rename service name, click **Actions** on the top right and select **Rename service**.

Resource list / Data Engine -ADIT Active Add tags

**Manage**

Deployment details

CRN: crn:v1:bluemix:public:sql-query:us-south:a/4bef0e934d554f35b216c35407936346:ae12ca73-0c51-432a-901e-433c173aa065::

API Endpoint: https://api.dataengine.cloud.ibm.com

Encryption

Encryption method: Service-managed key encryption

<https://cloud.ibm.com/docs/services/sql-query/sql-query.html>

## 16. Click on Launch Data Engine UI.

Resource list / Data Engine -ADIT Active Add tags

**Details** Actions...

**Manage**

Deployment details

CRN: crn:v1:bluemix:public:sql-query:us-south:a/4bef0e934d554f35b216c35407936346:ae12ca73-0c51-432a-901e-433c173aa065::

API Endpoint: https://api.dataengine.cloud.ibm.com

Encryption

Encryption method: Service-managed key encryption

IBM Cloud Data Engine

Type SQL here, then click the Run button or press Shift + Enter to submit...  
Press Esc followed by Tab to escape the editor using a keyboard.

New:  
Press Ctrl + Space after FROM, INTO, JOIN, EMIT and LOCATION to browse possible locations.

Set default result location ↗ Run

Batch jobs

No jobs created  
Jobs are listed here when running

Cookie Preferences

## 17. Under Samples, click on Starter queries for sample queries.

IBM Cloud Data Engine

Type SQL here, then click the Run button or press Shift + Enter to submit...  
Press Esc followed by Tab to escape the editor using a keyboard.

New:  
Press Ctrl + Space after FROM, INTO, JOIN, EMIT and LOCATION to browse possible locations.

Set default result location ↗

Tables Samples Connect Docs Support

Sample queries

Browse sample queries by category

Starter queries	7 >
Base queries	6 >
Advanced queries	9 >
CSV & JSON parsing queries	5 >
ELT & ETL queries	11 >
Spatial queries	3 >
Time series queries	6 >
Read as text queries	3 >
Index management	13 >
Index management on tables	13 >
Catalog management statements	11 >
Reference data statements	9 >

Batch jobs

No jobs created  
Jobs are listed here when running

## 18. Under starter queries, select **Table exploration**.

The screenshot shows the IBM Cloud Data Engine interface. On the left, there's a sidebar for 'Batch jobs' which says 'No jobs created'. In the center, there's a diagram illustrating data flow between various databases like MySQL, PostgreSQL, Oracle, and Db2. On the right, a 'Starter queries' panel is open, listing several options: 'Table exploration' (which is highlighted with a green arrow), 'DESCRIBE schema', 'Using row number', 'Produce JSON output', 'Write to exact target path', 'Multi-way join', and 'Simple self join'. Below the list is a button labeled 'All samples'.

## 19. Click **Run**.

The screenshot shows the IBM Cloud Data Engine interface. At the top, there is a navigation bar with links for Tables, Samples, Connect, Docs, Support, and a user icon. Below the navigation bar is a code editor window containing a SQL query:

```

1 -- Example of a table exploration query:
2 SELECT *
3 FROM cos://us-geo/sql/customers.csv STORED AS CSV
4 ORDER BY CustomerID
5 LIMIT 50
6
7 -- This query selects all columns of a table and limits the result to 50 rows.
8 -- Use it to explore a particular table.
9

```

Below the code editor is a "Set default result location" dropdown and a "Run" button, both highlighted with green arrows. To the right of the code editor is a "Batch jobs" section with the message "No jobs created". On the far right, there is a data flow diagram illustrating the connection between various data sources like CSV, DB2, and Cloud Object Storage, and operations like Import, Export, MapReduce, and Query.

## 20. Inside Browse Object Storage, click **create**.

The screenshot shows the IBM Cloud Data Engine interface with a modal dialog titled "Set result location" open. The modal contains instructions about setting a default result location and a warning message: "No Cloud Object Storage is available. You must have a Cloud Object Storage instance to select a bucket or object." A green arrow points to this warning message. The background shows the same SQL query editor and data flow diagram as the previous screenshot.

## 21. Choose IBM Cloud as an Infrastructure.

The screenshot shows the IBM Cloud Object Storage creation interface. At the top, there's a navigation bar with links for Catalog, Services, and a search bar. Below that, the service name 'Cloud Object Storage' is displayed along with its status ('Free'), region ('Global'), plan ('Lite'), service name ('Cloud Object Storage-2z'), and resource group ('Default').

The main area is titled 'Choose an Infrastructure' and contains two options:

- IBM Cloud**: Described as creating storage in globally available data center locations. It includes a small icon of a computer monitor.
- Satellite**: Described as utilizing infrastructure from on-premise data centers or edge networks. It includes a small icon of a satellite dish.

Below this, there's a section for selecting a pricing plan. It shows a table with columns for Plan, Features, and Pricing. The 'Lite' plan is selected, showing it's free and includes up to 25 GB of storage capacity and 2,000 objects. There's also a note about the Lite plan being allowed per account.

On the right side, there are buttons for 'Create' (highlighted in blue), 'Add to estimate', and 'View terms'.

## 22. Choose **Lite plan** and provide a unique Cloud object storage service name. Click on **Create** on the right bottom.

https://cloud.ibm.com/objectstorage/create

**IBM Cloud** Search resources and products... Catalog Manage Arpita Roy's Account

Plan	Features	Pricing
Lite	Lite plan instance is free to use for Storage capacity up to 25 GB per month. Lite plan instance is used for trial, and can be easily upgraded to Standard plan for unlimited scalability and full functionality.	Free
Standard	Standard plan is our most popular Pay-as-You-Go pricing plan. There is no minimum fee. This plan meets the requirements of most of the enterprise workloads.	<a href="#">View storage class pricing</a>
One Rate	One Rate plan offers a flat monthly charge that includes capacity, and built-in allowances for outbound bandwidth and data access. It is best suited for active workloads with large amounts of outbound bandwidth as a percent of their storage capacity.	<a href="#">View storage class pricing</a>

Configure your resource

Service name: Cloud Object Storage-ADIT Select a resource group: Default

Tags: Examples: env:dev, version-1

**Create**

https://cloud.ibm.com/objectstorage/crn%3Av1%3Abluemix%3Apublic%3Acloud-object-storage%3Aglobal%3Aa%2F4bef0e934d554f35b216c35407936346%3Afca3d...

**IBM Cloud** Search resources and products... Catalog Manage Arpita Roy's Account

**Cloud Object Storage**

An enterprise cloud object storage solution

Welcome to your new IBM® Cloud Object Storage service! It provides unstructured data storage for cloud applications. To get started - create a bucket, upload objects and set up access policies to allow other users to work with your data.

[Learn More](#)

Overview Create bucket Access Management

**Create bucket**

### 23. Go to **create bucket** tab and Click on **Create Bucket**.

The screenshot shows the IBM Cloud Object Storage interface. On the left, there's a sidebar with options like Instances, Integrations, Endpoints, Documentation, and Billing. The main area has tabs for Overview, Create bucket (which is highlighted with a blue box and a green arrow), and Access Management. Below the tabs, the title 'Create a bucket' is displayed. A text block explains the importance of organizing data into buckets. At the bottom, there's a 'Create Bucket' button with a green arrow pointing to it. To the right of the button, there are sections for 'Naming your bucket', 'Avoid Personal Information', and 'Special Characters'.

### 24. Choose **create a Custom Bucket** and click **create**.

This screenshot shows the 'Create bucket' page with four options: 'Create a Custom Bucket', 'Quickly get started', 'Archive your data', and 'Host a static website'. Each option has a 'Template' button. The 'Create a Custom Bucket' section is highlighted with a blue box and a green arrow pointing to its 'Create' button. Below each section, there are requirements and a 'Create' button with a right-pointing arrow.

25. Provide a **unique bucket name**. Select the Resiliency as **Regional** and Location as **United States – Dallas (us-south)**. Finally click on **Create bucket**.

Cloud Object Storage-ADIT / Create custom bucket

Unique bucket name: **bucket-adit**

**Bucket naming rules:**

- Must be unique across the **whole** IBM Cloud Object Storage system
- Do not use any personal information (any part of a name, address, financial or security accounts or SSN)
- Must start and end in alphanumeric characters (3 to 63)
- Characters allowed: lowercase, numbers and nonconsecutive dots and hyphens

**Resiliency:** A bucket's resiliency is defined by the endpoint used to create it.

- Cross Region**: Highest availability
- Regional**: Best performance (selected)
- Single Site**: Data sovereignty

**Location:** Select a location where you would like your data to be physically stored.

United States - Dallas (us-south) (selected)

**Create bucket**

Instances / Cloud Object Storage-ADIT / **bucket-adit**

**Objects**

If you're seeing more usage than expected, versions count towards your usage or you may have incomplete uploads [Learn more](#)

Object name	Archived	Size	Last modified

**Objects**

Drag and drop files (objects) to upload. An object is your data in fixed form.

Drag and drop files (objects) here or click to upload

## 26. Click on Access with Data Engine.

The screenshot shows the IBM Cloud Object Storage interface. On the left, there's a sidebar with 'Cloud Object Storage' selected under 'Instances'. The main area shows a list of objects in the 'bucket-adit' bucket. At the top right of the main area, there are several buttons: 'Transfers', 'Details', and 'Actions...'. A green arrow points to the 'Upload' button, which is highlighted with a blue border. Below the list, there's a section for dragging files to upload, with a placeholder text 'Drag and drop files (objects) here or click to upload'.

## 27. Copy the Object Data Engine URL

This screenshot shows the same IBM Cloud Object Storage interface as the previous one, but with a modal window open on the right. The modal is titled 'Access with Data Engine'. It contains a section for 'Object Data Engine URL' with a description: 'The Data Engine URL is a reference url used inside of an Data Engine statement, used to perform queries against objects storing structured data.' Below this is a text input field containing the URL 'cos://us-south/bucket-adit/' and a copy icon. Another green arrow points to this URL field. The modal also has a 'Cancel' button at the bottom left and an 'Open in Data Engine' button at the bottom right.

28. Paste the copied URL in **Enter URI** inside IBM cloud data engine and click **Run**.

The screenshot shows the IBM Cloud Data Engine interface. On the left, there is a code editor with a sample SQL query:

```

1 -- Example of a table exploration query:
2 SELECT *
3 FROM cos://us-geo/sql/customers.csv STORED AS CSV
4 ORDER BY CustomerID
5 LIMIT 50
6
7 -- This query selects all columns of a table and limits the result to 50 rows.
8 -- Use it to explore a particular table.
9

```

On the right, a modal window titled "Set result location" is open. It contains instructions: "The statement does not contain an INTO clause and no default result location is set. Specify the Object Storage location to write the query results, and optionally set it as your default for future queries." Below this are two buttons: "Browse Object Storage" and "Enter URI". A green arrow points from the "Enter URI" button to the input field where the URL was pasted. Further down, there is a "Default result location" section with a URI input field containing "cos://us-south/bucket-adit/" and a "Set as default result location" checkbox. A green arrow points from this section to the "Run" button at the bottom right of the modal. The "Run" button is highlighted with a blue box and a green arrow pointing to it.

## Output/Results snippet:

The screenshot shows the IBM Cloud Data Engine interface after the query has been run. At the top, the status bar indicates "Default result location: cos://us-south/bucket-adit/ Change". Below this, the "Batch jobs" section shows a "Completed" job with ID 6f592300-bb63-40f0-b4c7... and a start time of 12:06 PM. The "Result" tab is selected, displaying a table with 11 columns and 50 rows of data. The columns are: customerID, company..., contactN..., contactTitle, address, city, region, postalCode, country, phone, and fax. The data includes entries for various customers like ALFKI, ANATR, ANTON, AROUT, BERGS, BLAUS, and BLONP, with details such as address, city, and contact information. The table is scrollable, and a green border highlights the entire results area.

customerID	company...	contactN...	contactTitle	address	city	region	postalCode	country	phone	fax
ALFKI	Alfreds F...	Maria An...	Sales Re...	Obere Str...	Berlin		12209	Germany	030-0074...	030-0076...
ANATR	Ana Trujillo...	Ana Trujillo	Owner	Avda. de ...	México D.F.		05021	Mexico	(5) 555-4...	(5) 555-3...
ANTON	Antonio ...	Antonio ...	Owner	Matadero...	México D.F.		05023	Mexico	(5) 555-3...	
AROUT	Around th...	Thomas ...	Sales Re...	120 Hano...	London		WA1 1DP	UK	(171) 555...	(171) 555...
BERGS	Berglund...	Christina ...	Order Adm...	Berguvsv...	Luleå		S-958 22	Sweden	0921-12 ...	0921-12 ...
BLAUS	Blauer Se...	Hanna M...	Sales Re...	Forsterstr...	Mannheim		68306	Germany	0621-08460	0621-08924
BLONP	Blondesd...	Frédériou...	Marketing...	24 place ...	Strasbourg		67000	France	88.60.15.31	00 00 00 00

## Activity 10

**Aim:** Create access groups in IBM Cloud using IAM.

**Learning outcome:** Able to understand the Cloud, Architecture, App Development & Deployment in cloud environment.

**Duration:** 2 hours

**List of Hardware/Software requirements:**

1. Laptop / Desktop with windows 10
2. Internet

**Code/Program/Procedure (with comments):**

Before you begin:

To manage or create new access groups, you must have the following type of access:

- Account owner
- Administrator or editor on the IAM Access Groups account management service in the account
- Administrator or editor for the All Account Management services

Additionally, an administrator or editor can be assigned access to manage an individual group by creating an access policy where the resource is the Access group ID.

**Creating an access group in the console**

A unique name is required to differentiate access groups in the account. To create an access group, complete the following steps:

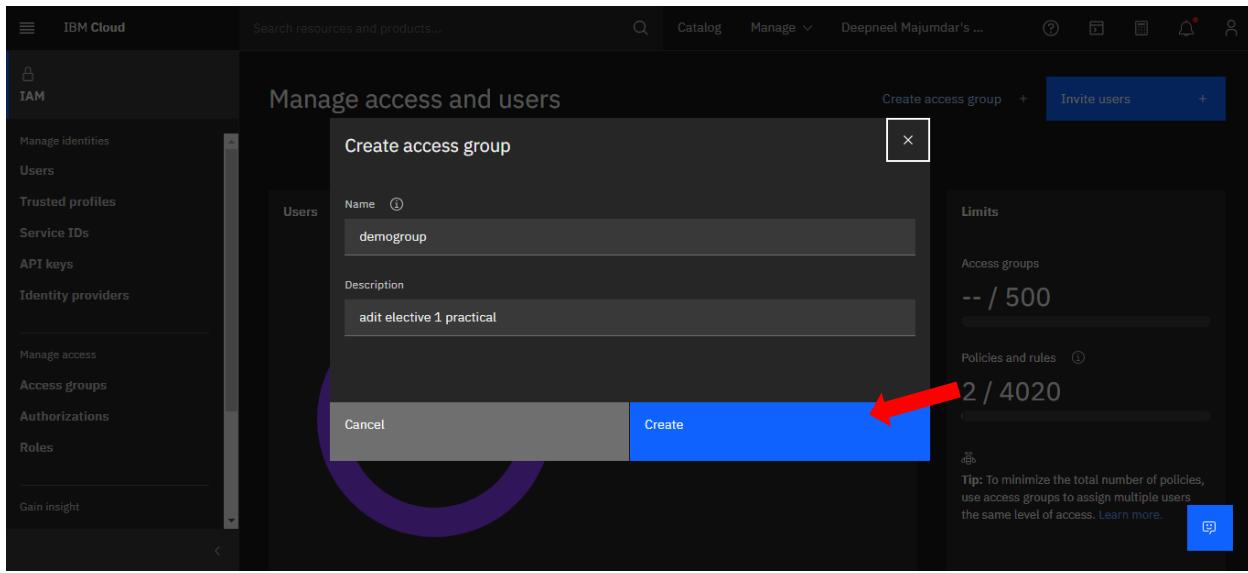
1. In the IBM Cloud® console, click **Manage > Access (IAM)**, and select **Access Groups**.

The screenshot shows the IBM Cloud dashboard with the 'Manage' dropdown menu open. The 'Access (IAM)' option is highlighted with a red arrow. The dashboard includes sections for User access, News, and IBM Cloud status.

2. Click **Create**.

The screenshot shows the 'Manage access and users' page in the IBM Cloud IAM section. The 'Create access group' button is highlighted with a red arrow. The page displays user management statistics and a large purple circular icon.

3. Enter a unique name to identify your access group, an optional description, and click **Create**.



Next, continue to set up your groups by adding users, service IDs, or trusted profiles.

### Assigning access to a group in the console

After you set up your group with users and service IDs, you can assign a common access policy to the group. Remember, any policy that you set for the group applies to all entities within the group.

Use the following steps to assign access to a group in the console:

1. In the IBM Cloud console, click **Manage > Access (IAM)**, and select **Access Groups**.

IBM Cloud

Search resources and products...

Catalog Manage Deepneel Majumdar's ...

Create access group + Invite users +

IAM

- Manage identities
- Users
- Trusted profiles
- Service IDs
- API keys
- Identity providers
- Manage access
- Access groups**
- Authorizations
- Roles
- Gain insight

https://cloud.ibm.com/iam/groups

Users

Total users: 1

Active: 1

Limits

Access groups: 1 / 500

Policies and rules: 2 / 4020

Tip: To minimize the total number of policies, use access groups to assign multiple users the same level of access. Learn more.

Type here to search

Breaking news

23:17 10-12-2023

- For the group that you want to assign access, select the **Actions** icon, and click **Assign access**.

IBM Cloud

Search resources and products...

Catalog Manage Deepneel Majumdar's ...

Create +

IAM

- Manage identities
- Users
- Trusted profiles
- Service IDs
- API keys
- Identity providers
- Manage access
- Access groups**
- Authorizations
- Roles
- Gain insight

Access groups

Create access groups to quickly and easily assign access to a set of users, service IDs and trusted profiles. To add identities and assign access to an existing group, click the group name. [Learn more](#).

Group	Description
demogroup	adit elective 1 practical
Public Access	This group includes all users and service IDs by default. All group members, i

Manage group

Assign access

Remove

Items per page: 25 1-2 of 2 items

Type here to search

Humid

23:21 10-12-2023

3. You can assign access to only resources that you manage. You must assign at least one access option. For any access options that you don't add and configure, the default value of No access is assigned. Depending on the options that you are authorized to manage, you can assign the following types of access:
  - a. A **group of services**, like All Identity and Access enabled services, All Account Management services, or All IAM Account Management services.
  - b. A **specific service**

The screenshot shows the IBM Cloud IAM interface. On the left, a sidebar lists various IAM management options. The 'Access groups' option is currently selected. The main area displays a dialog titled 'Assign access to demogroup'. Under the heading 'How do you want to assign access?', there is a note: 'Assign access Access Groups does not support Classic Infrastructure or Cloud Foundry'. Below this, a 'Create policy' section has 'UI' selected. The 'Service' tab is active, showing a dropdown menu where 'All IAM Account Management services' is chosen. A tooltip for this option states: 'A subset of account management services that includes IAM Identity, IAM Access Management, IAM User Management, and IAM Groups.' At the bottom of the dropdown, a red arrow points to the 'Next >' button. To the right, the 'Access summary' panel shows '0 Assignments' and a message: 'You haven't added any access.' Buttons for 'Assign' and 'Cancel' are also visible.

4. Next, you can scope the access to all resources or specific resources based on selected resource attributes like access management tags, location, or resource group.
5. Select all roles that apply. To view what actions are mapped to each role, click the numbers listed next to each role. Some services support the use of advanced operators to grant access to resources that satisfy specific naming conventions. See [Assigning access by using wildcard policies](#) for more information.

The screenshot shows the 'Create policy' wizard in the IBM Cloud IAM interface. The current step is 'Roles and actions'. On the left, a sidebar lists 'Access groups' as the selected category under 'Manage access'. The main panel displays a list of roles: 'User API key creator (1)', 'Service ID creator (1)', 'VPN Administrator (1)', 'Viewer (28)', 'Operator (56)', 'Editor (80)', 'Administrator (120)', and 'RC KeyManager (4)'. A modal window titled 'Administrator' provides a detailed description of the role's permissions, including actions like 'iam-identity/serviceid/get', 'iam-identity/serviceid/update', and 'iam-identity/serviceid/delete'. At the bottom left of the main panel, there is a 'Next >' button with a red arrow pointing to it.

## 6. Click Review.

The screenshot shows the 'Create policy' wizard in the IBM Cloud IAM interface. The current step is 'Conditions (optional)'. The sidebar still shows 'Access groups' selected. The main panel asks 'How do you want to assign access?' and displays a note: 'Assign access Access Groups does not support Classic Infrastructure or Cloud Foundry'. Below this, it says 'Create policy' and 'Service' (All IAM Account Management services). The 'Conditions (optional)' section contains a 'User API key creator, Service ID creator, VPN Administrator, Administrator' entry. At the bottom left, there is a 'Review' button with a red arrow pointing to it.

## 7. Click Add to add your policy configuration to your policy summary.

The screenshot shows the IBM Cloud IAM interface. On the left, a sidebar lists various IAM management options like Manage identities, Users, Trusted profiles, Service IDs, API keys, Identity providers, and Access groups. The 'Access groups' option is selected. The main area displays a 'Create policy' dialog with three tabs: UI (selected), JSON, and Service. Under the Service tab, it shows 'All IAM Account Management services' with an 'Edit' link. Below that is a 'Roles and actions' section listing 'Administrator, User API key creator, Service ID creator, VPN Administrator'. At the bottom of the dialog are 'Add' and ' >' buttons. To the right, an 'Access summary' panel shows a single assignment for 'All IAM Account Management services' with roles 'User API key creator', 'Service ID creator', 'VPN Administrator', and 'Administrator'. It includes 'Remove' and 'Edit' buttons. At the bottom right of the dialog is a blue 'Assign' button, which is highlighted with a red arrow.

8. Click Assign.

Reference: <https://cloud.ibm.com/docs/account?topic=account-groups&interface=ui>

## Activity 11

**Aim:** Invite users and add them in access groups using IAM in IBM Cloud.

**Learning outcome:** Able to understand the Cloud, Architecture, App Development & Deployment in cloud environment.

**Duration:** 2 hours

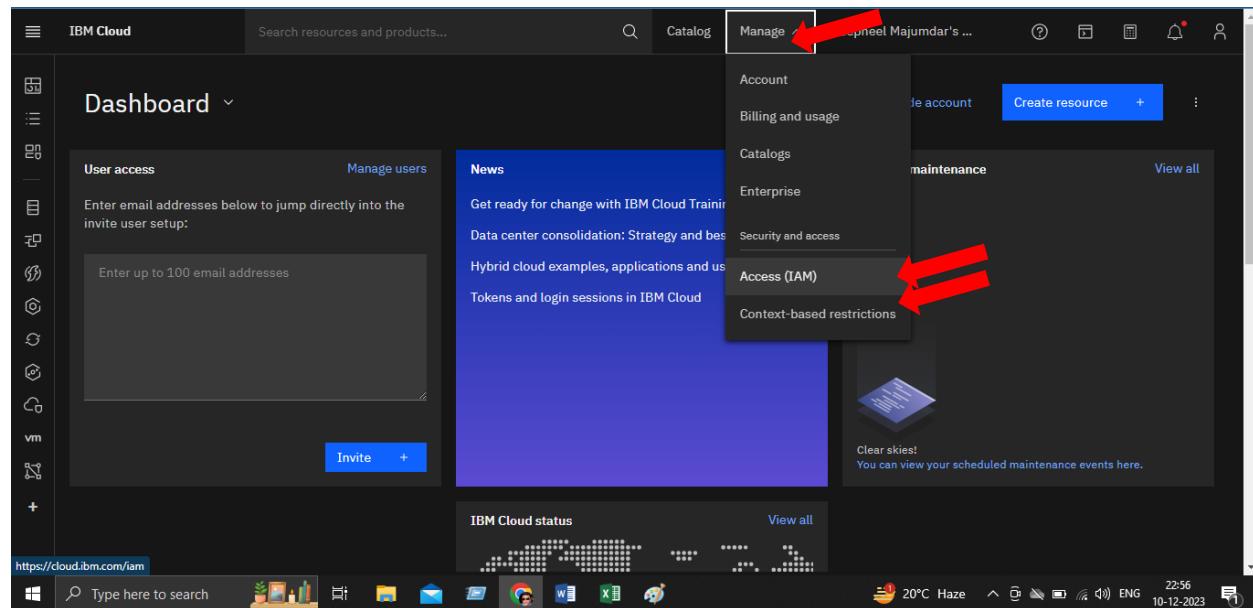
### List of Hardware/Software requirements:

2. Laptop / Desktop with windows 10
3. Internet

### Code/Program/Procedure (with comments):

You can invite one or multiple users in a single invite. If you invite multiple users in one invitation, the same access is assigned to each user. However, you can invite users to your account with no access, and assign them access later.

1. In the IBM Cloud console, go to **Manage > Access (IAM)**, and select **Users**.



2. Click **Invite users**. Specify the email addresses of the users. If you are inviting more than one user with a single invitation, they are all assigned the same access.

The screenshot shows the 'Manage access and users' page in the IBM Cloud IAM interface. On the left, there's a sidebar with various IAM-related options like 'Manage identities', 'Users', 'Trusted profiles', etc. The main area displays a large purple loading circle. In the top right, there are buttons for 'Create access group' and 'Invite users'. A red arrow points to the 'Invite users' button. Below it, there's a section for 'Limits' showing access group counts and policy rules.

The screenshot shows the 'Invite users' dialog box. It has fields for entering email addresses (with a note that at least one is required) and selecting access groups. There are tabs for 'Summary' and 'API'. The summary tab shows 0 users, 0 access groups, and 0 assignments. A red arrow points to the text input field for email addresses.

3. Add one or more of the access options that you manage. You must assign at least one access option. For any access options that you don't add and configure, the default value of No

access is assigned. Depending on the options that you are authorized to manage, you can assign the following types of access:

- a. Access groups: Click Add for each access group that you want the users to belong to.
- b. Access policy: Assign individual IAM access policies or classic infrastructure permissions.
  - i. Select Classic infrastructure, and then select from the three permission sets.
  - ii. Select a group of services like All Identity and Access enabled services, All Account Management services, and All IAM Access Management services, or select a specific service. Next, you can scope the access to the entire account or just one resource group. Then, select all roles that apply. To view what actions are mapped to each role, click the numbers listed next to each role.

Some services support the use of advanced operators to grant access to resources that satisfy specific naming conventions. See [Assigning access by using wildcard policies](#) for more information.

4. Then, select all roles that apply.
5. Select Add to save the access assignment to the invitation.
6. After you add all the necessary access assignments, click Invite.

The screenshot shows the 'Access groups' section of the IBM Cloud interface. A red arrow points to the 'demogroup' entry in the list, which is selected. Another red arrow points to the 'Invite' button at the bottom right of the modal window.

How do you want to assign access?

Access groups Streamline access management by adding the user to one or more existing access groups.

Access policy Assign the user individual access policies.

Select access groups

You can assign access to only the access groups that you have access to manage.

1 item selected

Group	Description
demogroup	edit elective 1 practical

Items per page: 10 > 1-1 of 1 items

Do you need to create a new access group? Go to the [Access groups](#) page.

Add >

Access summary

Summary API >

1 User 0 Access groups 0 Assignments

You haven't added any access, but that's ok. You can still invite users to your account.

Invite Cancel

User	Email	Status
Deepneel Majumdar	deepneel_adit@edunetmail.com	Active
deepneel@edunetfoundation.org		Processing

## Canceling or resending pending invitations

After inviting new users to join your account, IBM Cloud requires all except VPN-only users to accept the invitation to become an active user in your account.

*NOTE: The invitation expires after 30 days. New users to IBM Cloud can accept an invitation only by using the invitation link that they received through email.*

You can cancel an invitation for any users that are shown in a Processing or Pending state in the Status column of the Users page. If an invited user did not receive an invitation, you can resend the invitation to any user in a Pending state.

1. Go to the Users page.
2. Locate the row for the user in Processing or Pending state.
3. Click the Actions icon More Actions icon, then choose to Resend invite or Cancel invite.

The screenshot shows the IBM Cloud console interface. On the left, there's a sidebar with various options like 'Manage identities', 'Users' (which is selected), 'Trusted profiles', etc. The main area is titled 'Users'. It displays a table with columns 'User', 'Email', and 'Status'. There are two entries: one for 'Deepneel Majumdar' with status 'Processing' and another for 'deepneel\_adit@edunetmail.com' with status 'Active'. At the bottom right of the table, there's a red box around a 'Cancel invite' button. The taskbar at the bottom shows the Windows Start button, a search bar, and several pinned icons.

## Accepting invitations in the console

If the invited user is already a member of IBM Cloud, they receive an invitation link in their notifications and by email. On the Notifications page, users can use the search field to locate an invitation or filter by the notification type called account.

This screenshot is similar to the previous one but shows a different state. The 'Add VPN-only user' button in the top right of the user table is highlighted with a red box. The rest of the interface and data in the table are identical to the first screenshot.



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Reference: <https://cloud.ibm.com/docs/account?topic=account-access-getstarted>

<https://cloud.ibm.com/docs/account?topic=account-iamuserinv&interface=ui>

## Activity 12

**Aim:** Customize your IBM Cloud Dashboard.

**Learning outcome:** Able to understand the Cloud, Architecture, App Development & Deployment in cloud environment.

**Duration:** 2 hours

**List of Hardware/Software requirements:**

3. Laptop / Desktop with windows 10
4. Internet

**Code/Program/Procedure (with comments):**

The following instructions uses a fictitious project manager who is named Cora. She wants to understand total resource usage over the past year and how her team's budget is used to build a new chatbot with specific resources related to AI and machine learning.

**Step 1: Create a dashboard**

First, create a new dashboard and select a template.

1. In the IBM Cloud console, click the **Actions icon**, and select **Create a dashboard**.

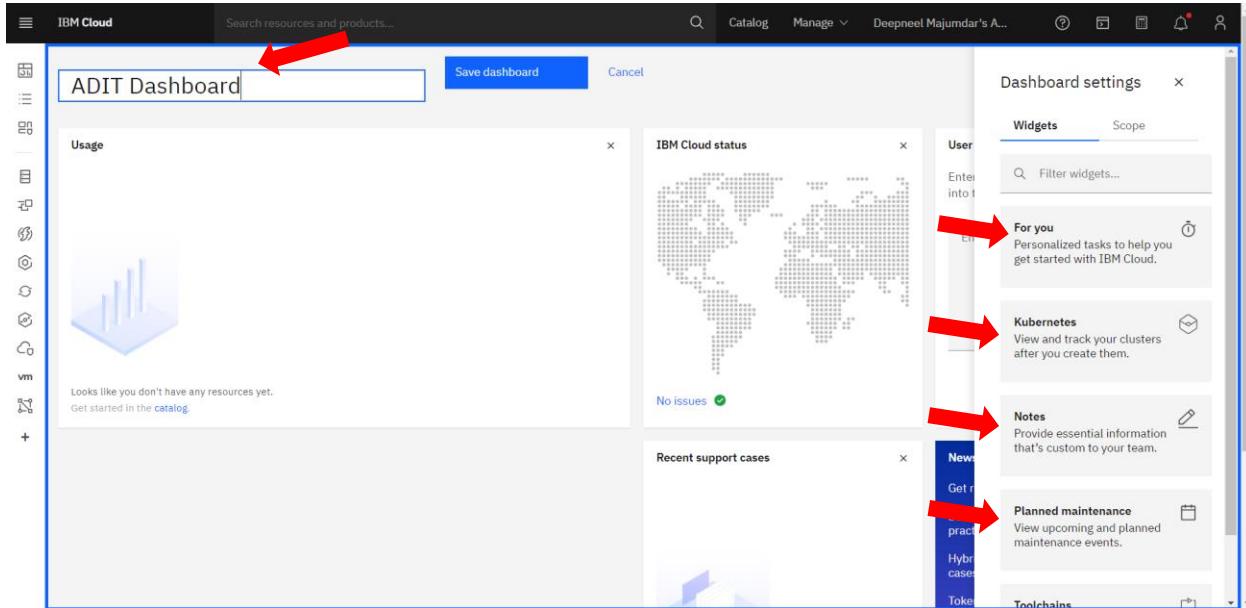
The screenshot shows the IBM Cloud dashboard interface. In the top right corner, there is a dropdown menu with several options: 'Upgrade account', 'Create resource', 'Create a dashboard' (which is highlighted with a red box and a red arrow pointing to it), 'Manage my dashboards', 'Edit', 'Share', 'Duplicate', and 'Delete'. The main dashboard area displays various service cards like 'Build', 'Db2', 'Build with Watson', 'Build cloud-native apps using IBM Cloud Object Storage', and 'Visit the IBM Cloud catalog'. Below these cards, there are sections for 'News', 'Recent support cases', 'Planned maintenance', and 'IBM Cloud status'.

2. Select the **Management** template from the available options, and then click **Create**.

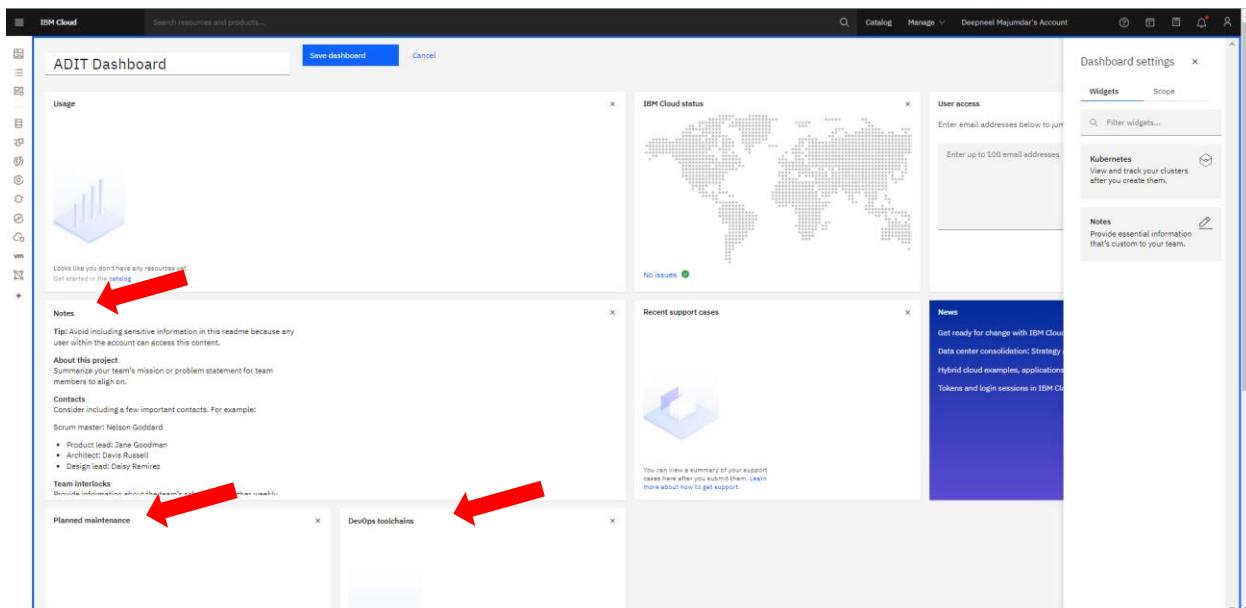
The screenshot shows the 'Create new dashboard' dialog box. It has a title 'Create new dashboard' and a sub-section 'Select a template'. There are four template options: 'Blank', 'Default', 'Development', and 'Management'. The 'Management' template is highlighted with a red box and a red arrow pointing to its checkbox. Below the templates, there is a description: 'Optimized to provide a mix of billing, access management, and other administrative widgets that Cora needs.' At the bottom of the dialog box are two buttons: 'Cancel' and 'Create'.

The Management template is optimized to provide a mix of billing, access management, and other administrative widgets that Cora needs.

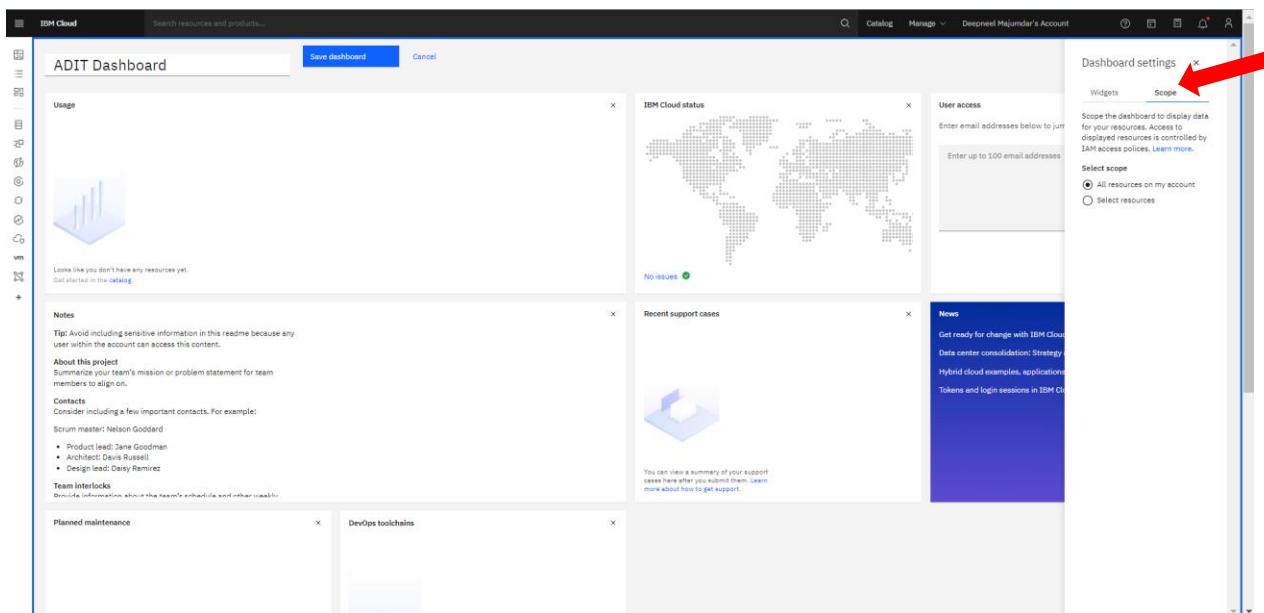
3. Enter your dashboard title in 30 characters or less.



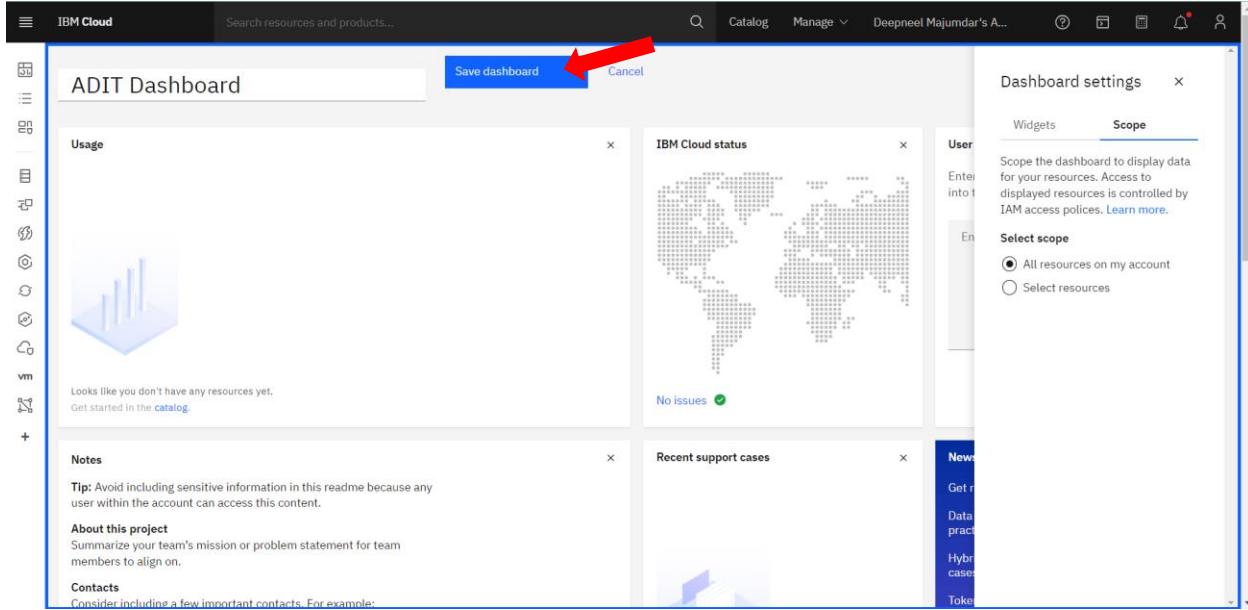
4. Next, use the Dashboard settings panel to add relevant widgets to your dashboard. To add widgets, drag the widgets onto your dashboard. Add the **Notes** widget to your dashboard. This widget is where Cora can provide essential information that's custom for the team that she shares the dashboard with.



- Click the **Scope** tab to select from the available resources in the account that you have access to. The scope determines the data that populates for the selected resources. You can filter the resource by group, tag, and location. Cora wants to select only resources that are related to AI and machine learning, so she filters by the resource group that exists for her team's chatbot project. Not all widgets can be scoped. If a widget can't be scoped, the data for all resources is displayed.



- Reorganize the layout to fit your needs. Cora moves Notes to the first row, next to Resource summary. In the next row, she includes the Usage, User access, and IBM Cloud status widgets.
- Click **Save dashboard**.



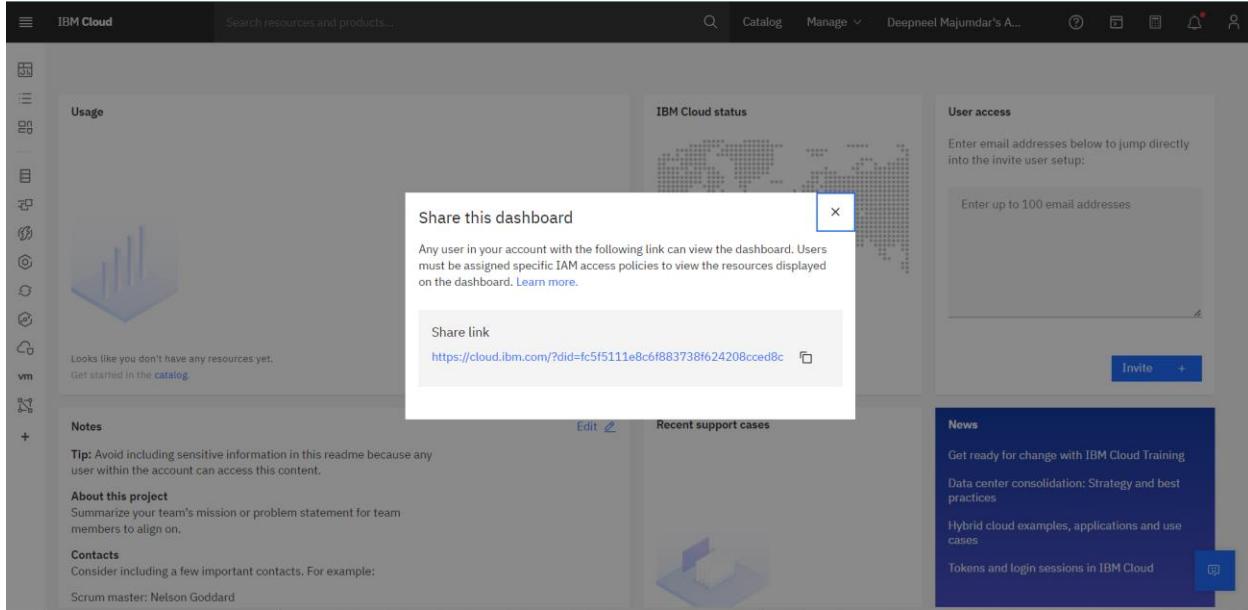
## Step 2: Share a dashboard with teammates

You can share dashboards with users in your account to give them access to view the dashboard. Cora wants to share her custom Management dashboard with her program director so they can talk about resource allocation and the budget for the next year.

To share a dashboard, click the **Actions** icon Action icon, and select **Share**. After you share it with a user and they click the link, the dashboard is added to their account.

The screenshot shows the IBM Cloud ADIT Dashboard. At the top right, there is a context menu with a red arrow pointing to the 'Share' option. The menu also includes 'Create a dashboard', 'Manage my dashboards', 'Edit', 'Duplicate', and 'Delete'. The dashboard itself displays sections for Usage, IBM Cloud status, Notes, and News.

All users with the dashboard link can share the dashboard, which means other users can see the populated data that they have permission to view. If they don't have the same permissions as the owner, for example, if they don't have access to Cora's chatbot resource group, they cannot view that data. Users without permissions to the scoped resources are able to view the dashboard layout, but not the populated data. A user with insufficient permissions might see a warning icon next to the dashboard that indicates a scoping error and that the data that's displayed might not be complete. Make sure that the users you share a dashboard with have access to the resources you scope the dashboard to.



### Step 3: Duplicate a dashboard

Cora decides that the team of developers she manages doesn't need to see the Usage for the project. Other than the Usage widget, she wants to share with them essentially the same dashboard that she shared with her program director.

You can duplicate a dashboard to include the same structure and layout without having to re-create the dashboard from scratch.

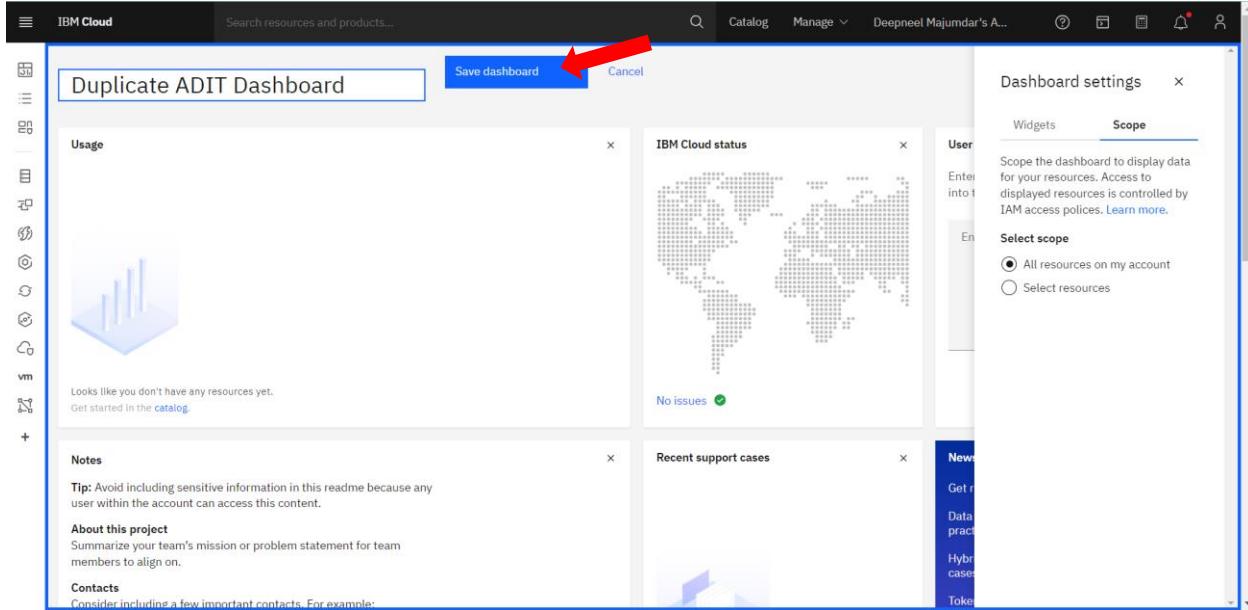
1. To duplicate a dashboard, click the Actions icon **Actions** icon > **Duplicate**.

The screenshot shows the IBM Cloud ADIT Dashboard. In the top right corner, there is a 'Create resource' button with a plus sign. A dropdown menu has appeared, listing several options: 'Create a dashboard', 'Manage my dashboards', 'Edit', 'Share', 'Duplicate', and 'Delete'. The 'Duplicate' option is highlighted with a blue box and a red arrow pointing to it.

2. Define the scope. The scope and assigned access is not saved from the dashboard that was duplicated. Cora applies the resource group filter for the chatbot project just like she did for the original dashboard.

The screenshot shows the 'Duplicate dashboard' confirmation dialog box. It contains the text: 'Duplicating this dashboard creates a new dashboard with the same layout. You must define the scope and dashboard access separately.' At the bottom of the dialog box are two buttons: 'Cancel' and 'Duplicate'. A red arrow points to the 'Duplicate' button.

3. Click Save dashboard.



4. Click the **Actions** icon Action icon, and select **Share** to share the new dashboard with the correct users.

## Next steps

To delete a dashboard, complete the following steps:

1. Expand the **Actions** icon Action icon, and select **Delete**.

Duplicate ADIT Dashboard

Usage

IBM Cloud status

User access

Notes

About this project

Contacts

Recent support cases

News

IBM Cloud

Search resources and products...

Edit dashboard

Upgrade account

Create resource

User access

Edit

Share

Duplicate

Delete

Invite

## 2. Click Delete.

Delete dashboard

Are you sure you want to delete the dashboard 'Duplicate ADIT Dashboard'? The dashboard will be permanently deleted for all users that can view the dashboard.

Cancel

Delete

Recent support cases

News

IBM Cloud

Search resources and products...

Edit dashboard

Upgrade account

Create resource

User access

Edit

Share

Duplicate

Delete

Invite

Reference: <https://cloud.ibm.com/docs/account?topic=account-tutorial-custom-dash>