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Aim : You are a developer tasked with deploying an application that requires connectivity to a Cloudant database on IBM Cloud. The application is developed using a serverless architecture and needs to be deployed on IBM Cloud Code Engine.

Steps to be accomplished to deploy the application based on Cloudant database connectivity on IBM Cloud Code Engine :

Practical 10.1: Prepare Your Application

Ensure your application is configured to connect to the Cloudant database. This may involve providing the necessary credentials and endpoint information in your application code or configuration files.

Practical 10.2: Set Up IBM Cloudant Database

If you haven't already, create a Cloudant database instance on IBM Cloud. Take note of the credentials and endpoint URL for this database as you will need them to configure the connection in your application.

Practical 10.3: Create IBM Cloud Code Engine Project

Log in to your IBM Cloud account and navigate to the IBM Cloud Code Engine dashboard. Create a new project to organize your application resources.

Practical 10.4: Deploy Application

Use the IBM Cloud Code Engine CLI or web interface to deploy your application

Practical 10.5: Test Connectivity

Test the connectivity between your application and the Cloudant database to ensure that data can be read from and written to the database as expected.

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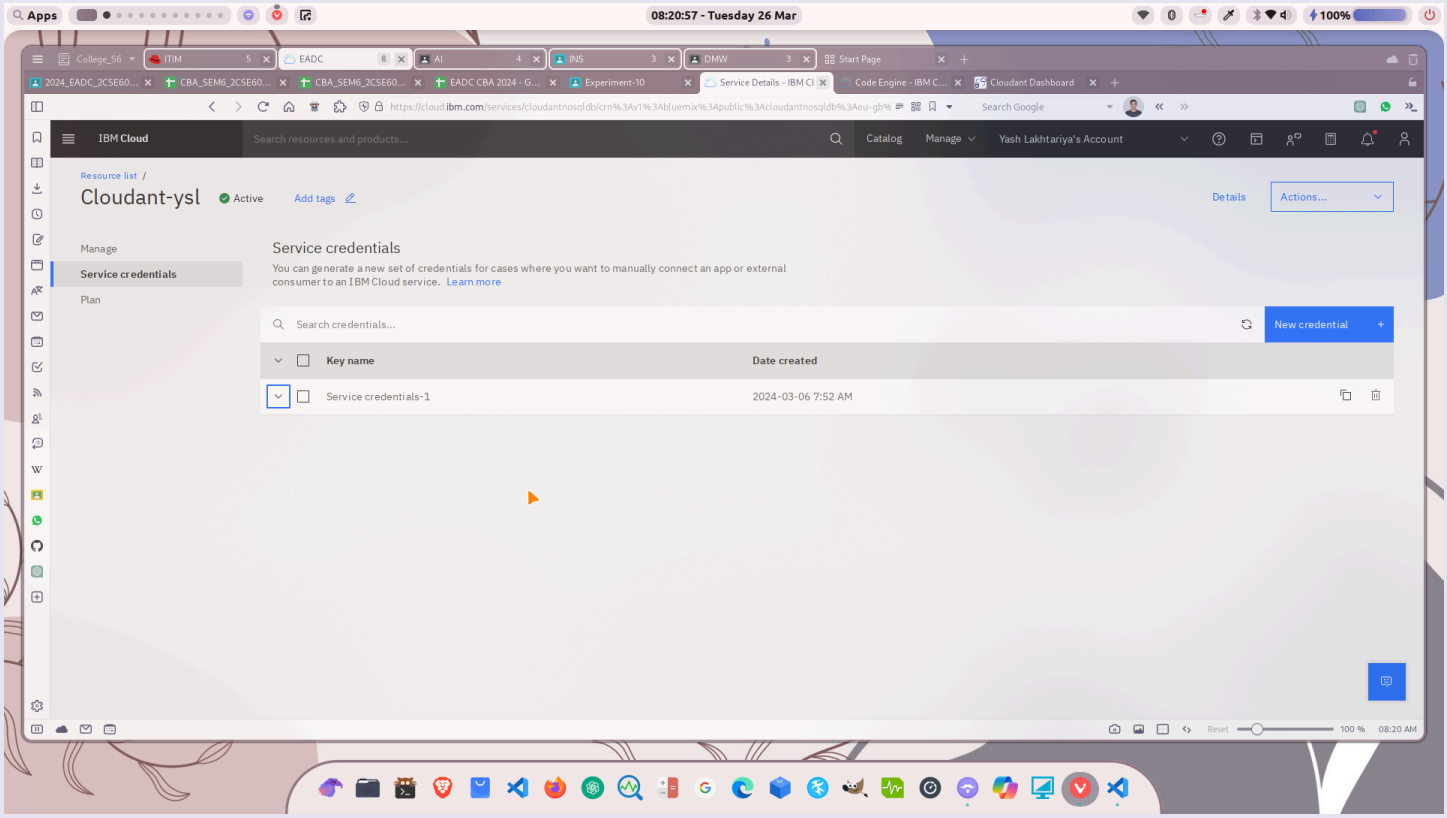
Steps and Screenshots :

1. Create Service Credentials in Cloudant service



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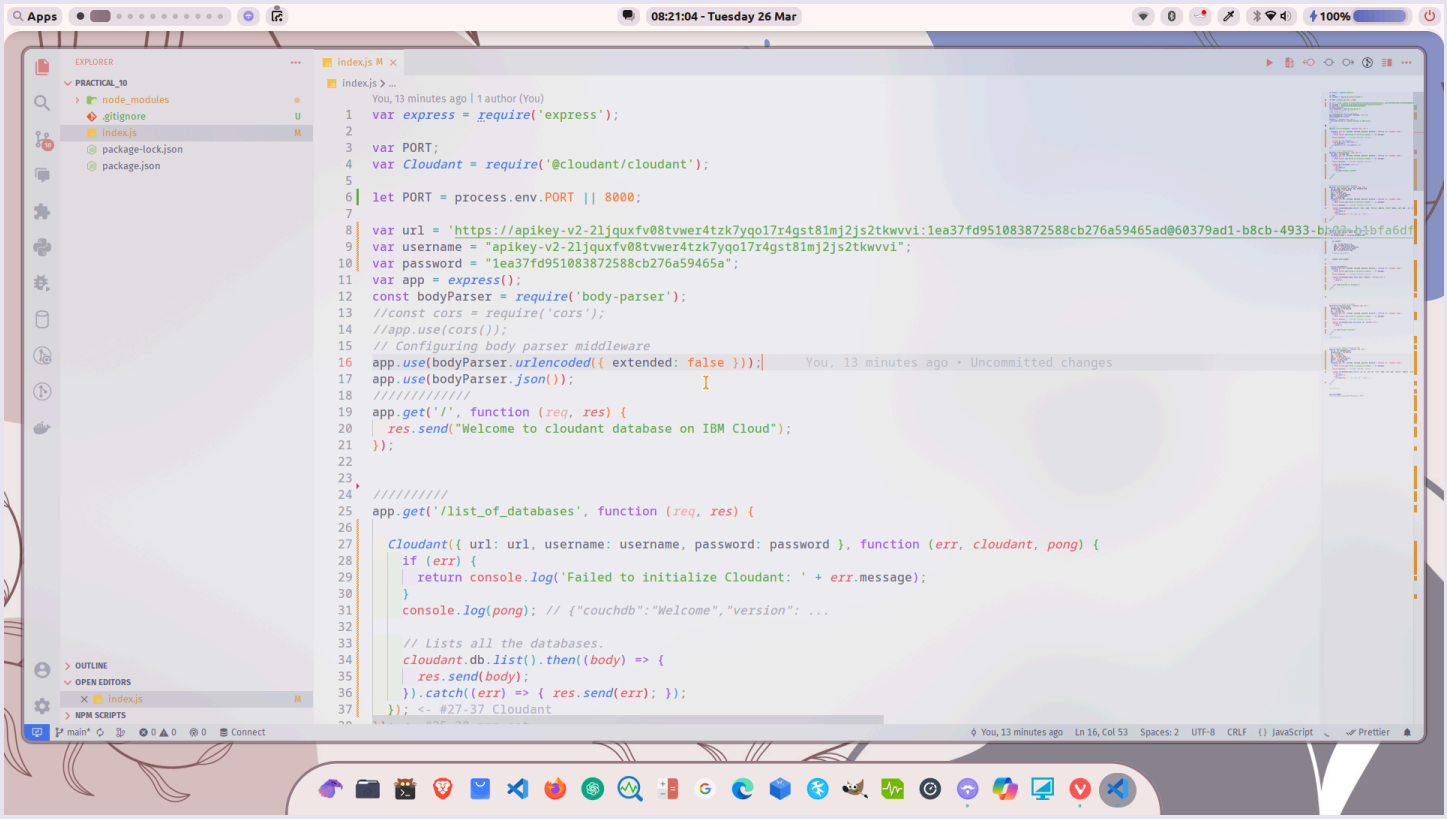
2. Copy and paste the credentials in the nodejs code



Code :

```
var express = require('express');

var Cloudant = require('@cloudant/cloudant');

var PORT = process.env.PORT || 8000;

var url =
'https://apikey-v2-2ljquxfv08tvwer4tzk7yqo17r4gst81mj2js2tkwvvi:1ea37fd951
083872588cb276a59465ad@60379ad1-b8cb-4933-bb03-b1bfa6df8a7e-bluemix.clouda
ntnosqldb.appdomain.cloud';
var username = "apikey-v2-2ljquxfv08tvwer4tzk7yqo17r4gst81mj2js2tkwvvi";
var password = "1ea37fd951083872588cb276a59465ad";
```

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```
var app = express();
const bodyParser = require('body-parser');
//const cors = require('cors');
//app.use(cors());
// Configuring body parser middleware
app.use(bodyParser.urlencoded({ extended: false }));
app.use(bodyParser.json());
//////////////

app.get('/', function (req, res) {
 res.send("Welcome to cloudant database on IBM Cloud");
});


//////////
app.get('/list_of_databases', function (req, res) {

 Cloudant({ url: url, username: username, password: password }, function
(err, cloudant, pong) {
   if (err) {
     return console.log('Failed to initialize Cloudant: ' + err.message);
   }
   console.log(pong); // {"couchdb":"Welcome","version": ...

   // Lists all the databases.
   cloudant.db.list().then((body) => {
     res.send(body);
   }).catch((err) => { res.send(err); });
 });
});


//////////////  create database
```

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```
app.post('/create-database', (req, res) => {
 var name = req.body.name;
 Cloudant({ url: url, username: username, password: password }, function
(err, cloudant, pong) {
   if (err) {
     return console.log('Failed to initialize Cloudant: ' + err.message);
   }
   console.log(pong); // {"couchdb":"Welcome","version": ...

   cloudant.db.create(name, (err) => {
     if (err) {
       res.send(err);
     } else {
       res.send("database created")

     }
   });
 });
});


////////////// insert single document
app.post('/insert-document', function (req, res) {
 var id, name, address, phone, age, database_name;
 database_name = req.body.db;
 id = req.body.id,
   name = req.body.name;
 address = req.body.address;
 phone = req.body.phone;
 age = req.body.age;
 Cloudant({ url: url, username: username, password: password }, function
(err, cloudant, pong) {
   if (err) {
```

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```
      return console.log('Failed to initialize Cloudant: ' + err.message);
    }
    console.log(pong); // {"couchdb":"Welcome","version": ..

    cloudant.use(database_name).insert({ "name": name, "address": address,
"phone": phone, "age": age }, id, (err, data) => {
      if (err) {
        res.send(err);
      } else {
        res.send(data); // { ok: true, id: 'rabbit', ...
      }
    });
 });
});


/////   insert bulk documents
app.post("/insert-bulk/:database_name", function (req, res) {
 const database_name = req.params.database_name;
 const students = [];

 for (let i = 0; i < 3; i++) {
   const student = {
     _id: req.body.docs[i].id,
     name: req.body.docs[i].name,
     address: req.body.docs[i].address,
     phone: req.body.docs[i].phone,
     age: req.body.docs[i].age,
   };

   students.push(student);
 }
```

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```
 Cloudant({ url: url, username: username, password: password }, function
(err, cloudant, pong) {
   if (err) {
     return console.log("Failed to initialize Cloudant: " + err.message);
   }

   cloudant.use(database_name).bulk({ docs: students }, function (err) {
     if (err) {
       throw err;
     }

     res.send("Inserted all documents");
   });
 });
});



/////////////// delete a document
app.delete('/delete-document', function (req, res) {
 var id, rev, database_name;
 database_name = req.body.db;
 id = req.body.id;
 rev = req.body.rev;
 Cloudant({ url: url, username: username, password: password }, function
(err, cloudant, pong) {
   if (err) {
     return console.log('Failed to initialize Cloudant: ' + err.message);
   }
   console.log(pong); // {"couchdb":"Welcome","version": ..

   cloudant.use(database_name).destroy(id, rev, function (err) {
     if (err) {
       throw err;
```

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```
    }

    res.send('document deleted');
  });
 });
});

//////////////// update existing document
app.put('/update-document', function (req, res) {
 var id, rev, database_name;
 database_name = req.body.db;
 id = req.body.id;
 rev = req.body.rev;
 name = req.body.name;
 address = req.body.address;
 phone = req.body.phone;
 age = req.body.age;
 Cloudant({ url: url, username: username, password: password }, function
(err, cloudant, pong) {
  if (err) {
    return console.log('Failed to initialize Cloudant: ' + err.message);
  }
  console.log(pong); // {"couchdb":"Welcome","version": ..

  cloudant.use(database_name).insert({ _id: id, _rev: rev, "name": name,
"age": age, "address": address, "phone": phone }, (err, data) => {
    if (err) {
      res.send(err);
    } else {
      res.send(data); // { ok: true, id: 'rabbit', ...
    }
  });
 });
```

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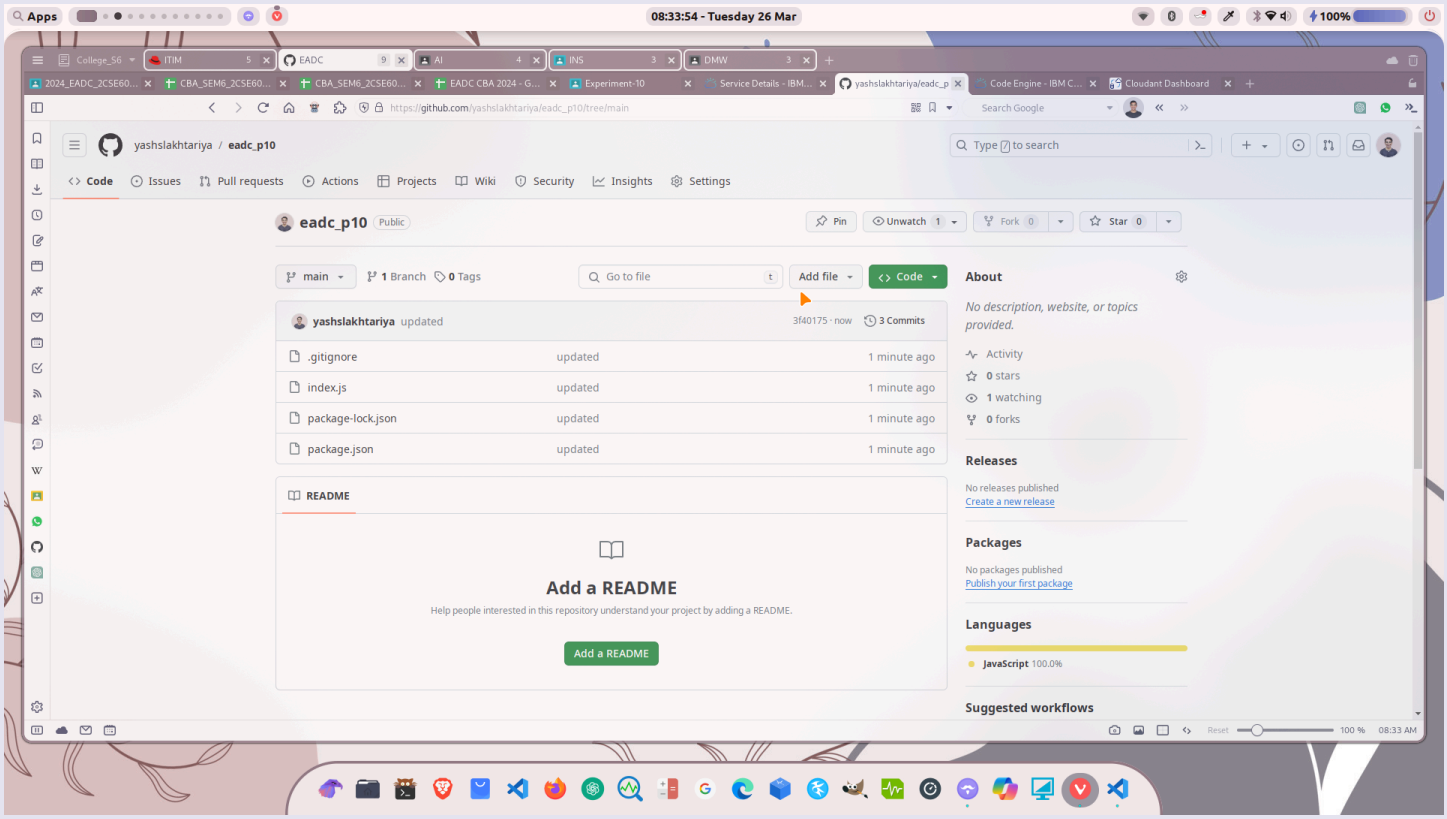
```
});
```

3. Create git repository of the application



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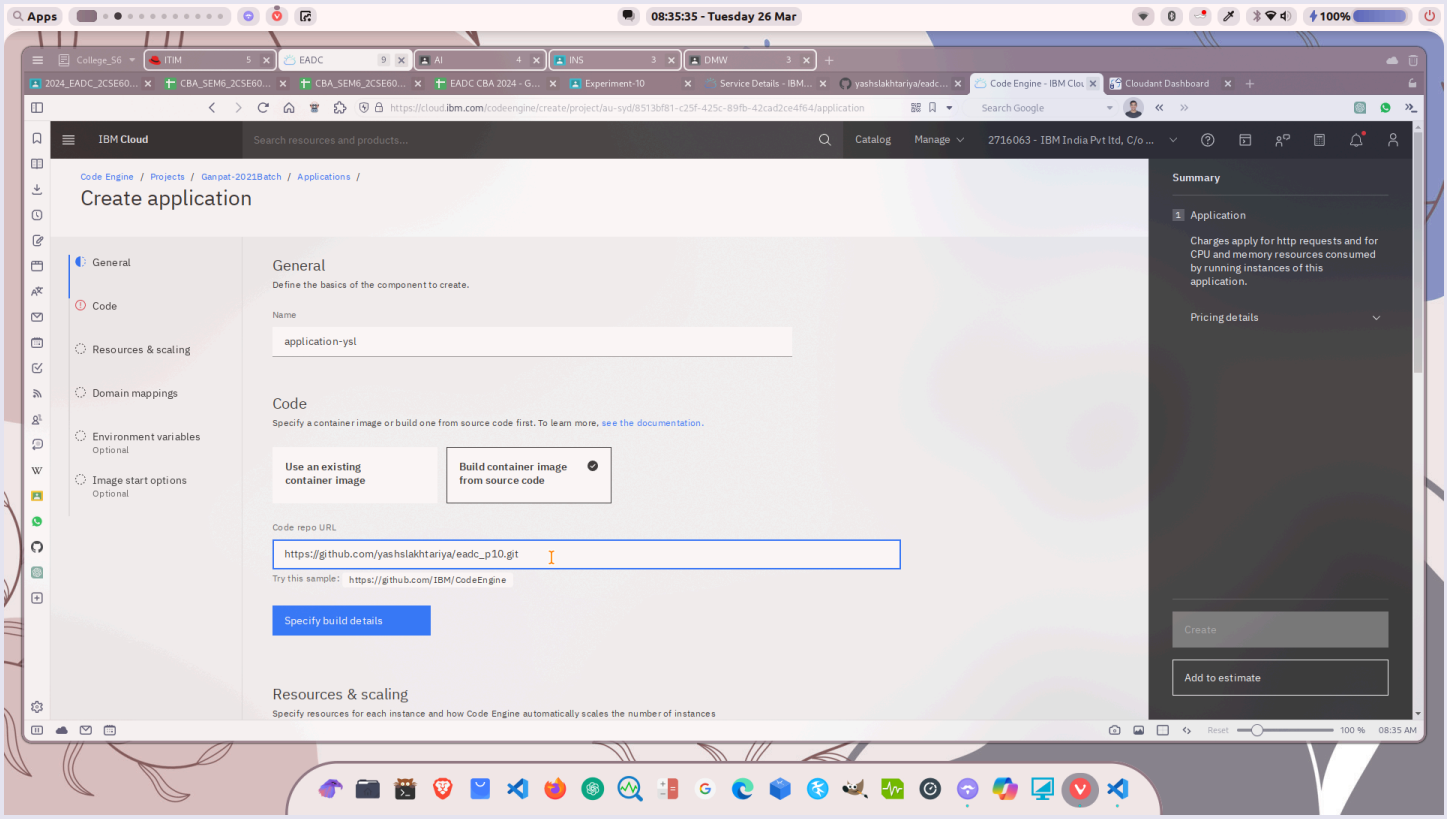
4. Create new application in the existing (or new) project on Code Engine



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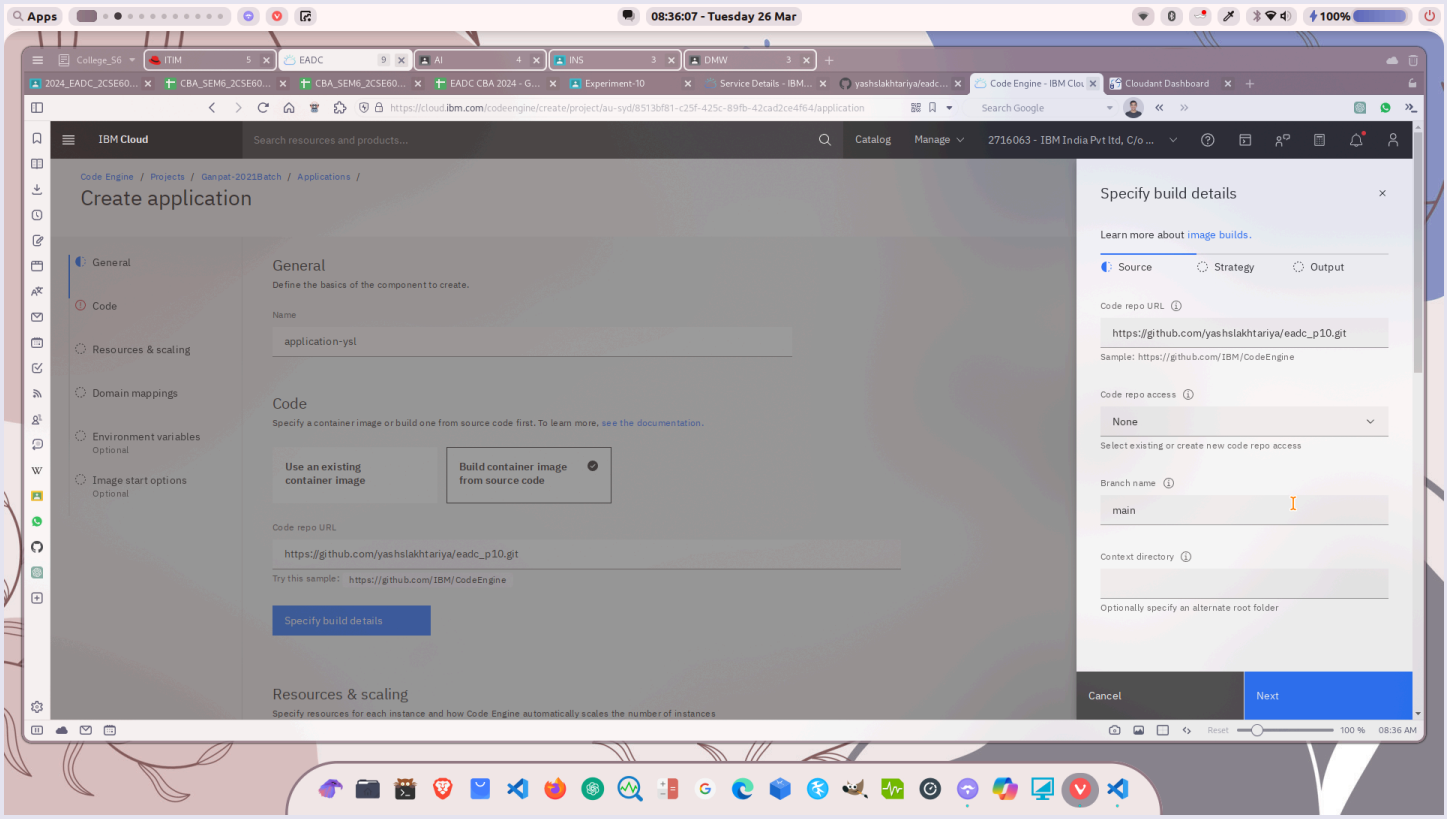
5. Specify build details, source as git repo and main branch



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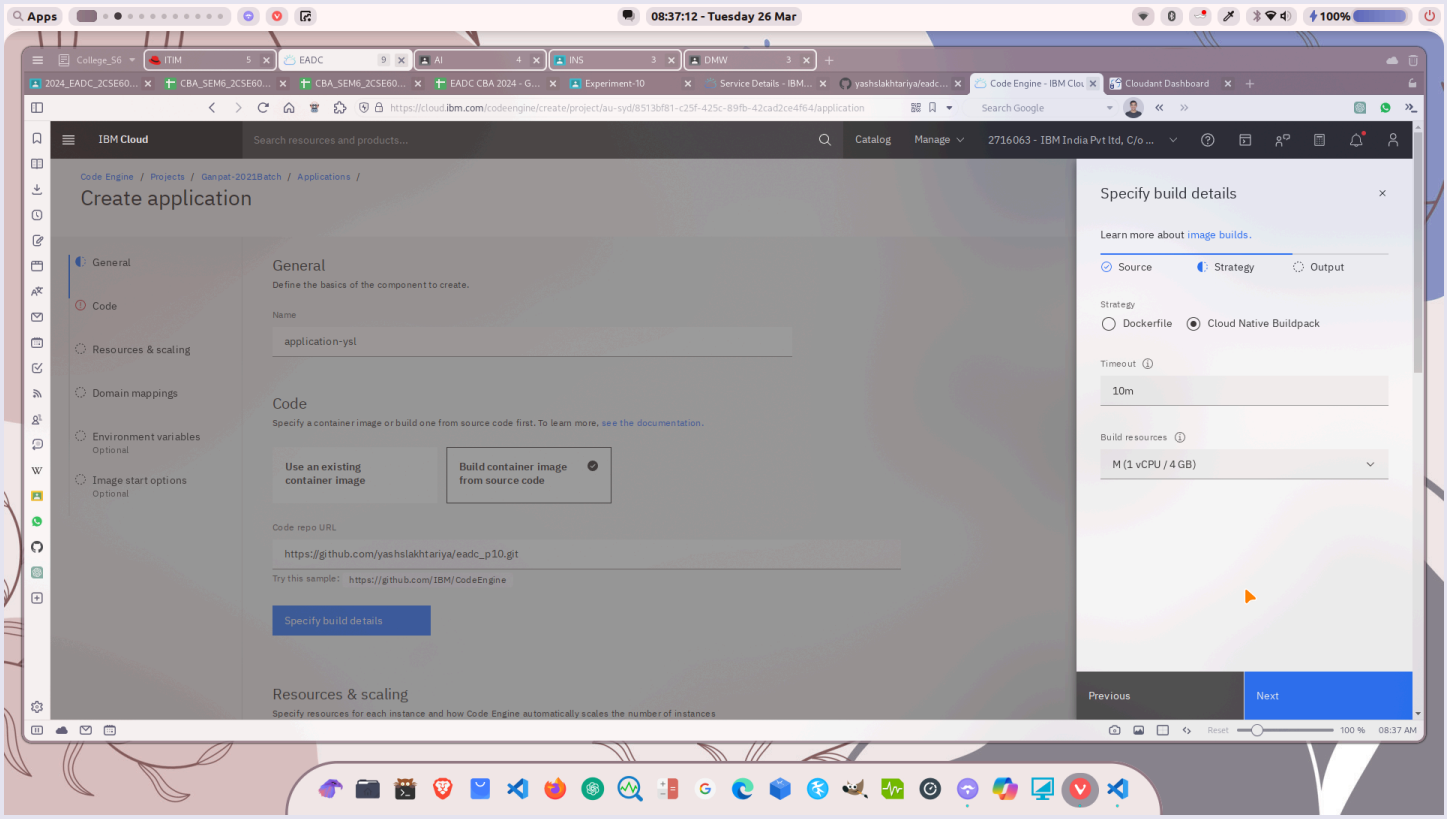
6. Use Cloud Native Buildpack as strategy as we don't have dockerfile



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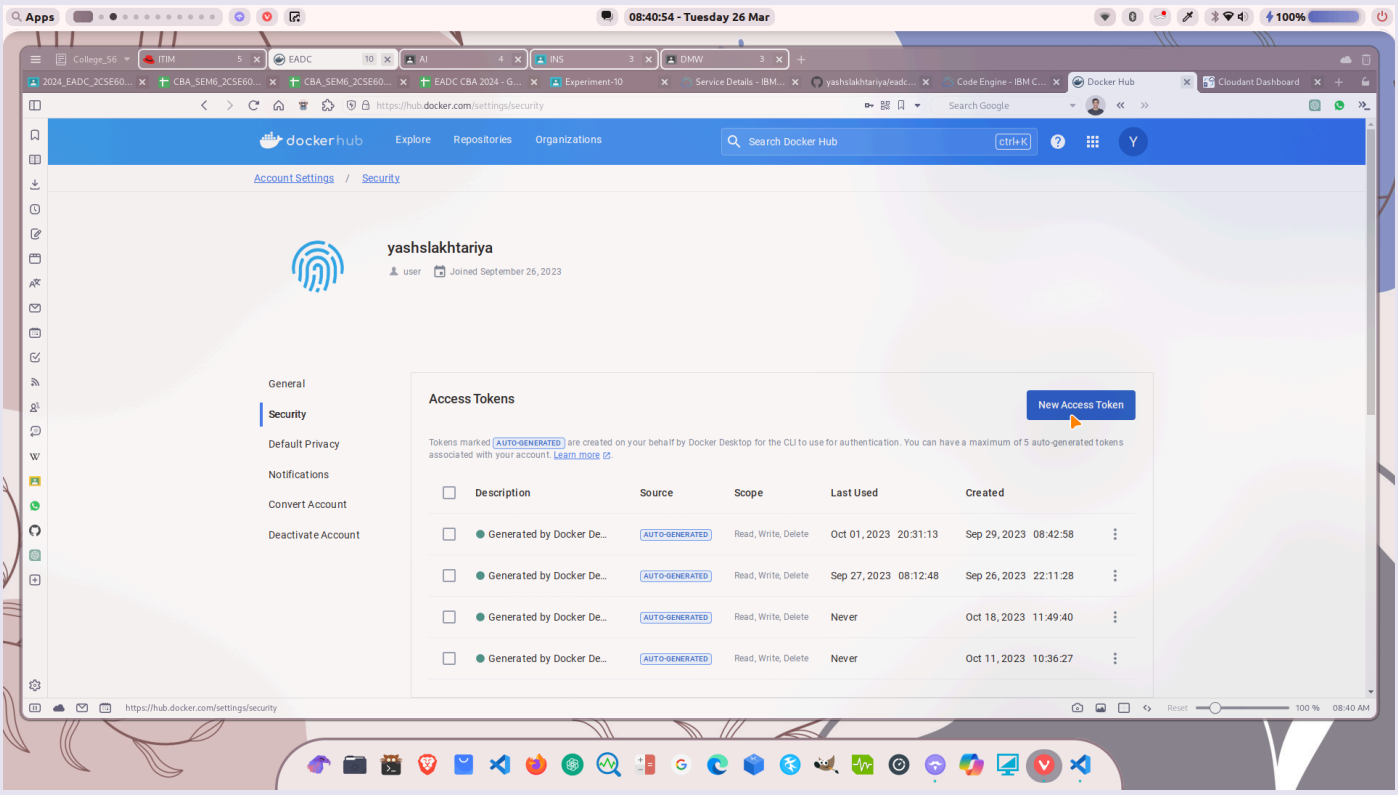
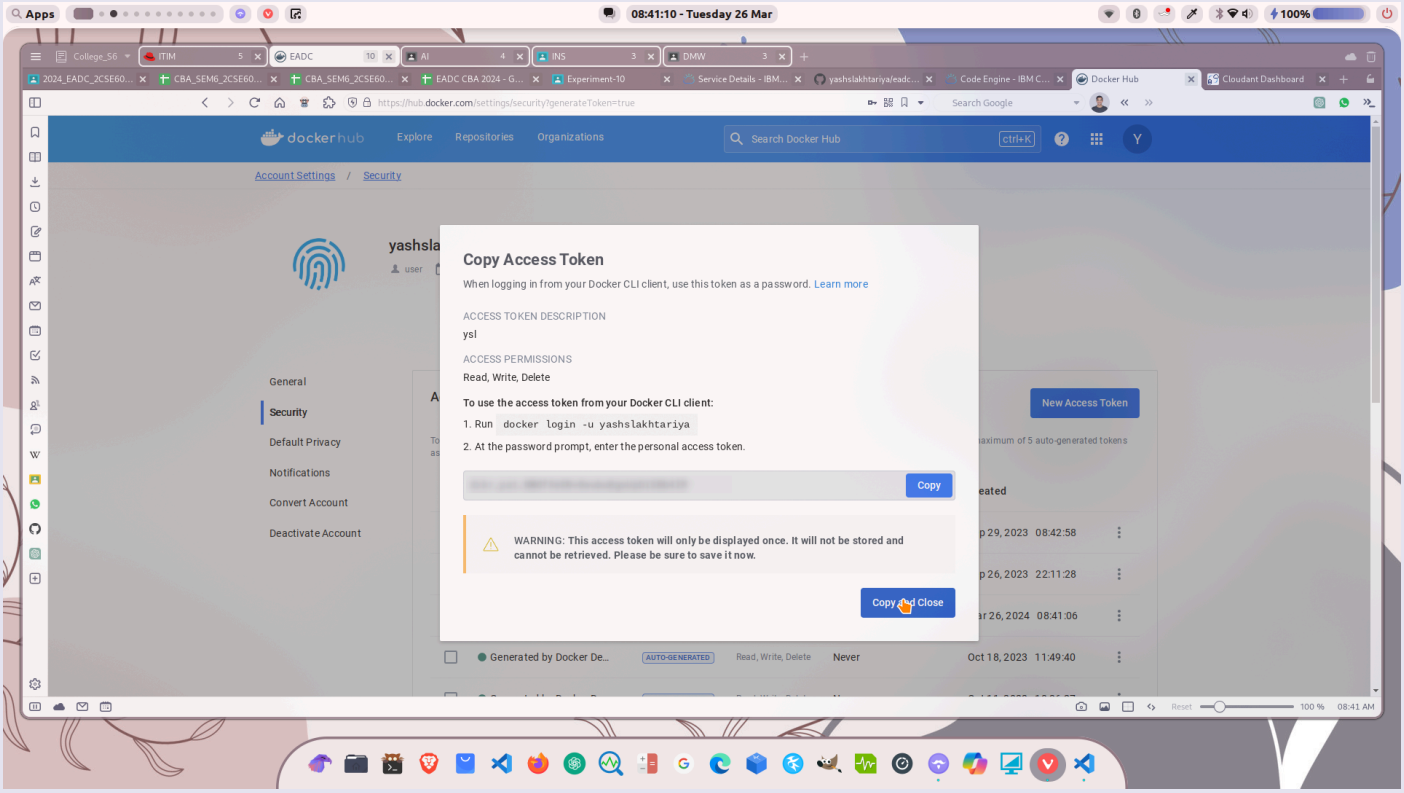
7. Create new access token if not existing in docker hub





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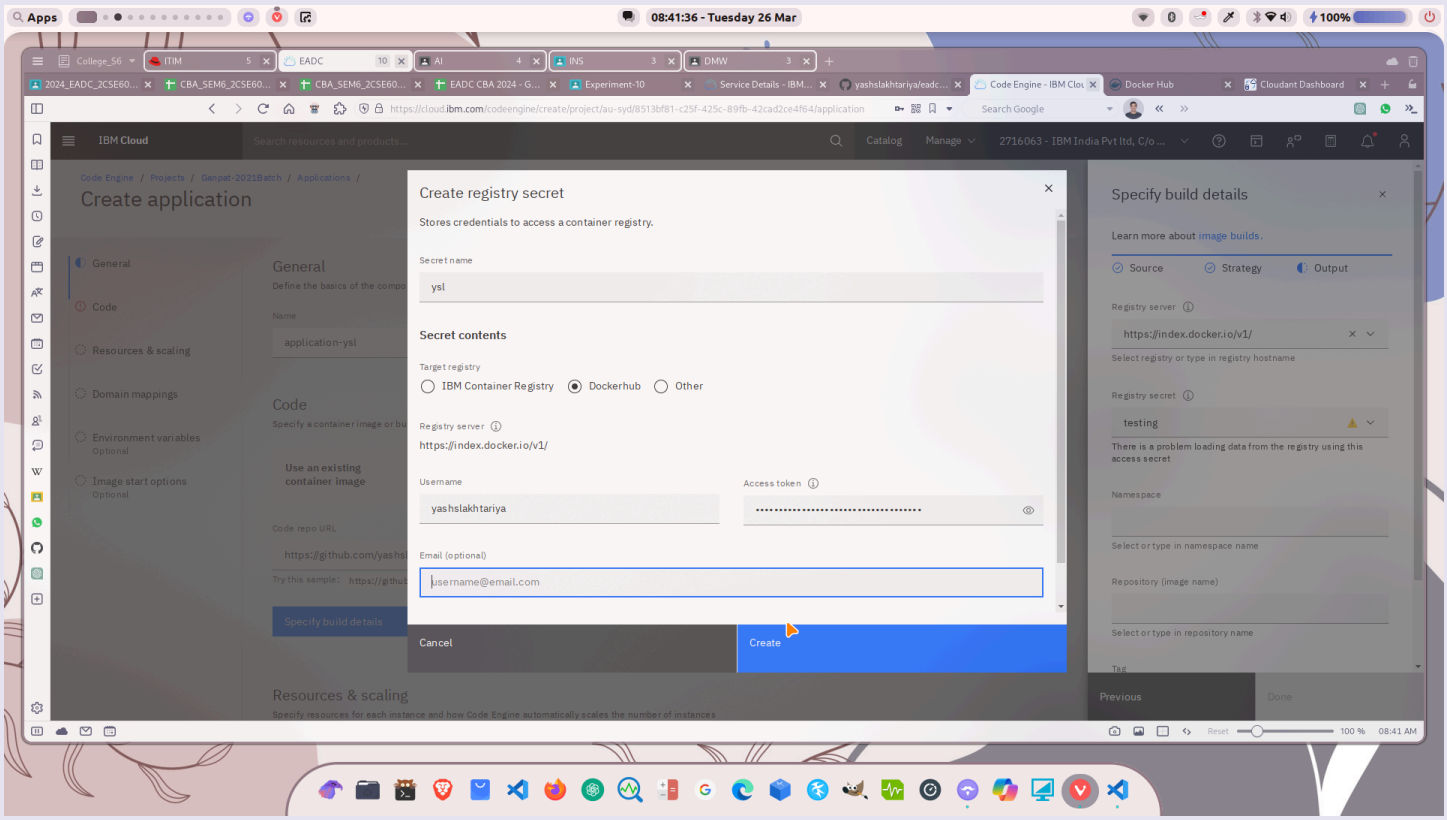
8. Create new registry secret if not existing specifying the username and access token



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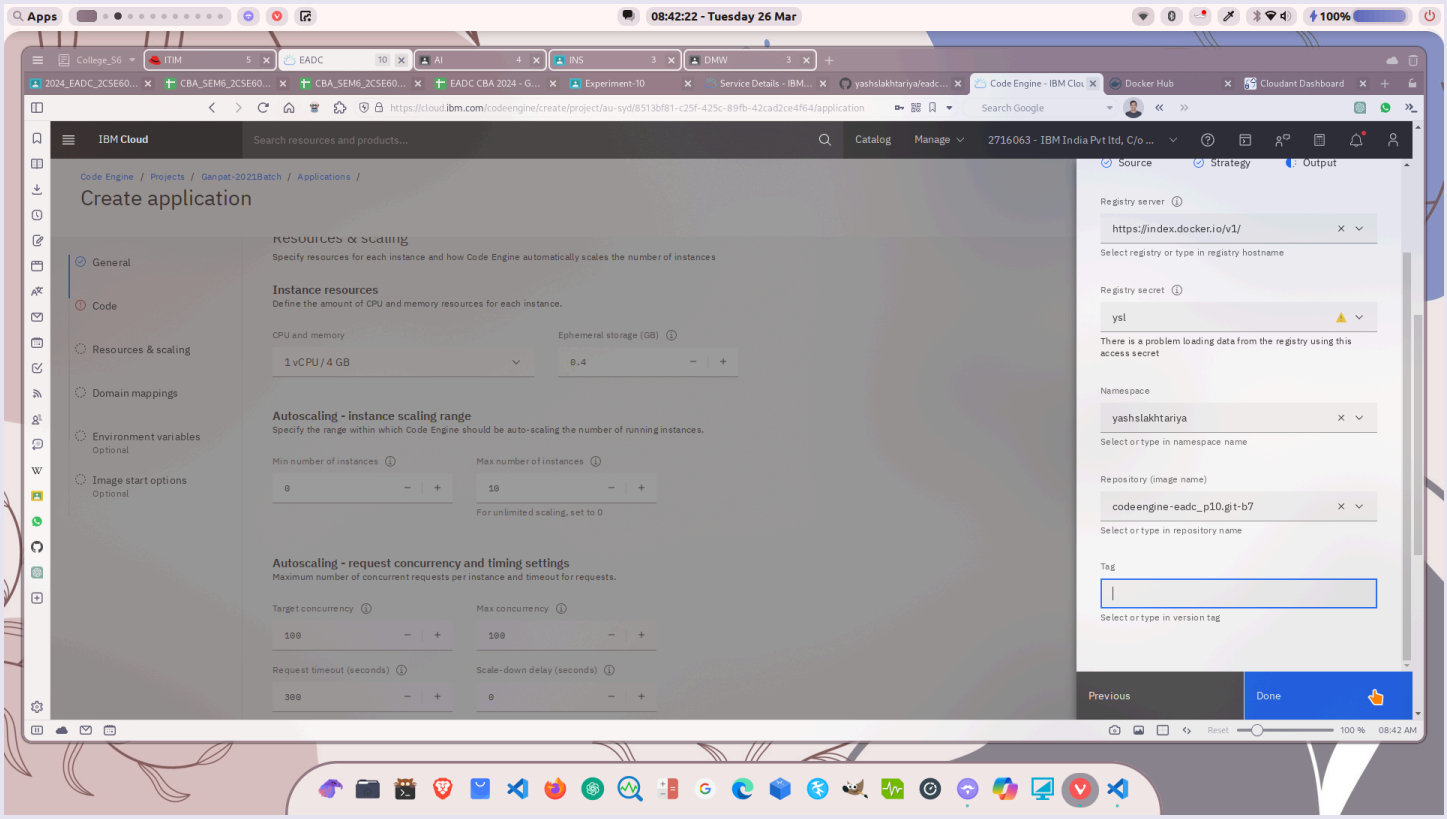
9. Use the registry secret in output tab



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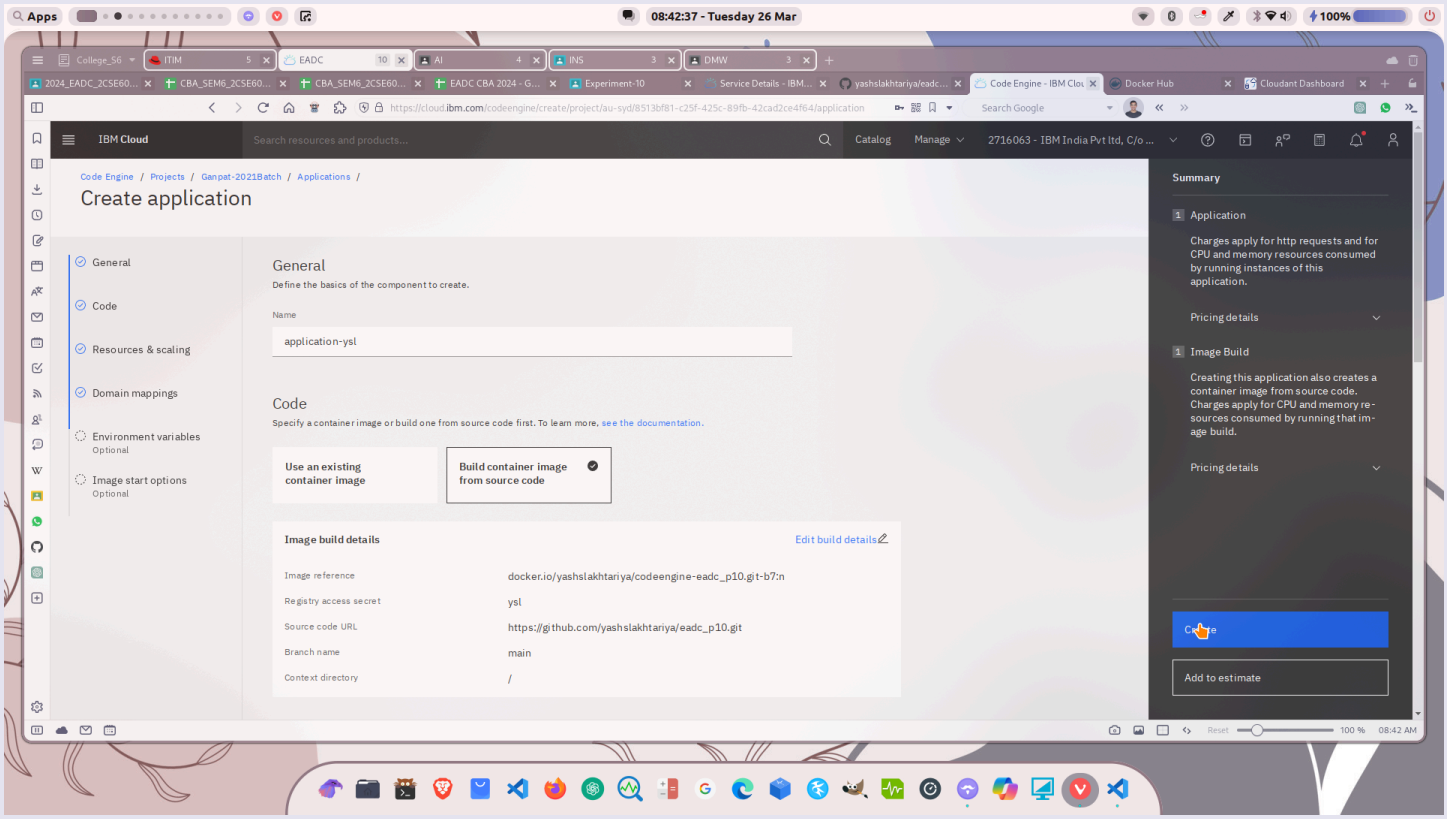
10. Create the application



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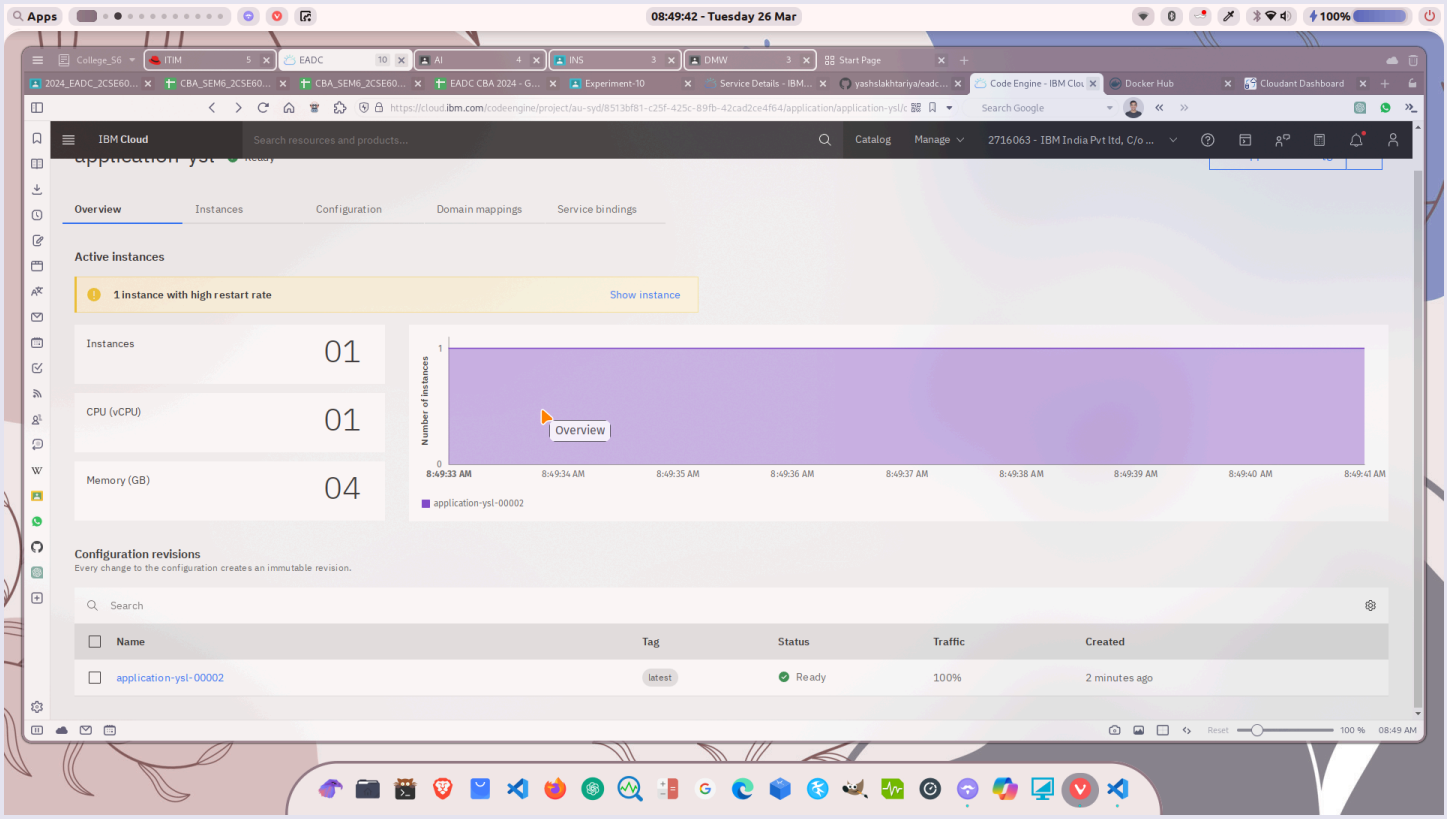
11. Wait for instance to be ready



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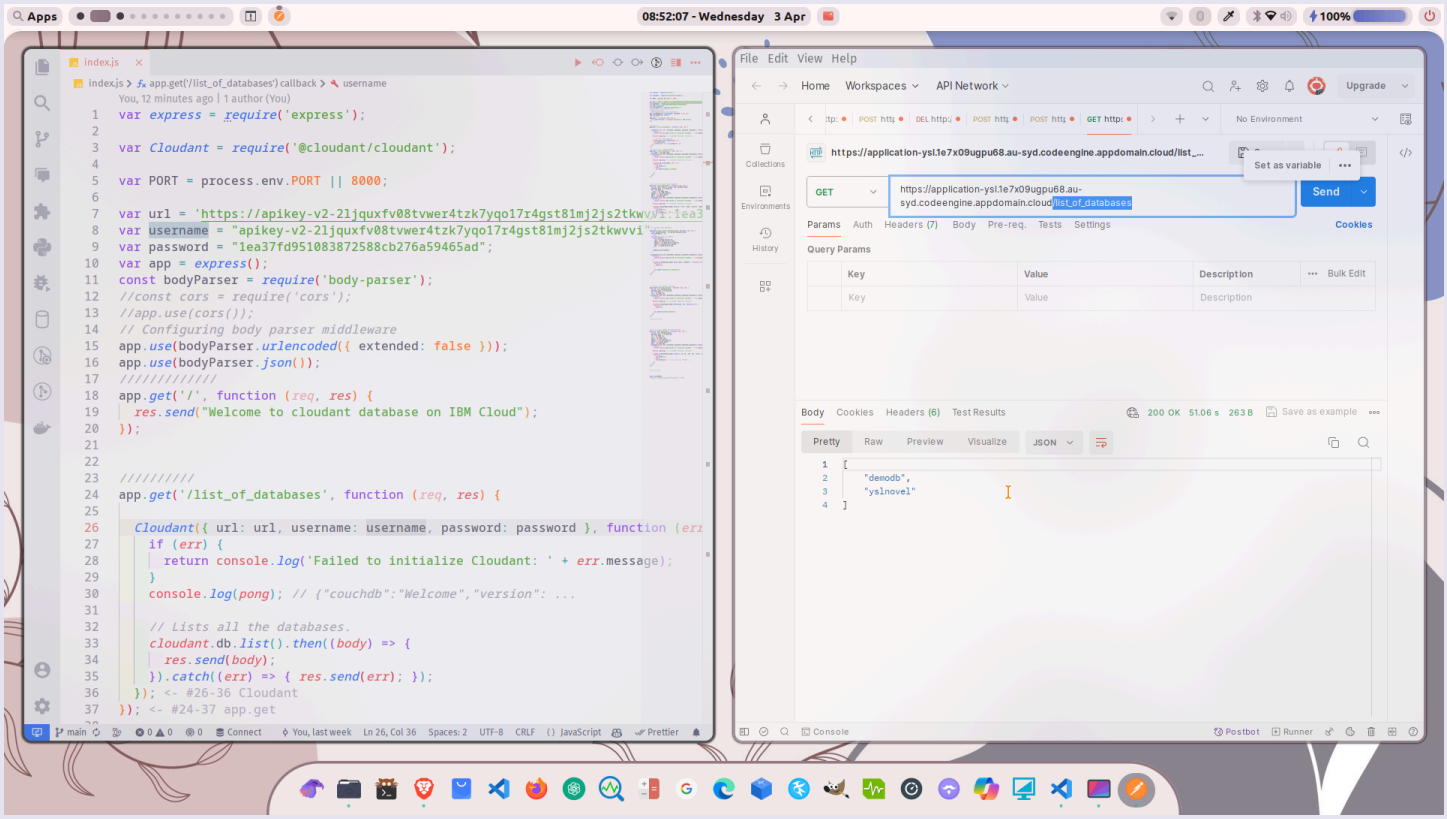
12. Now test the application using POSTMAN requests



Request : GET
URL : {appdomain}/list_databases

For listing all databases

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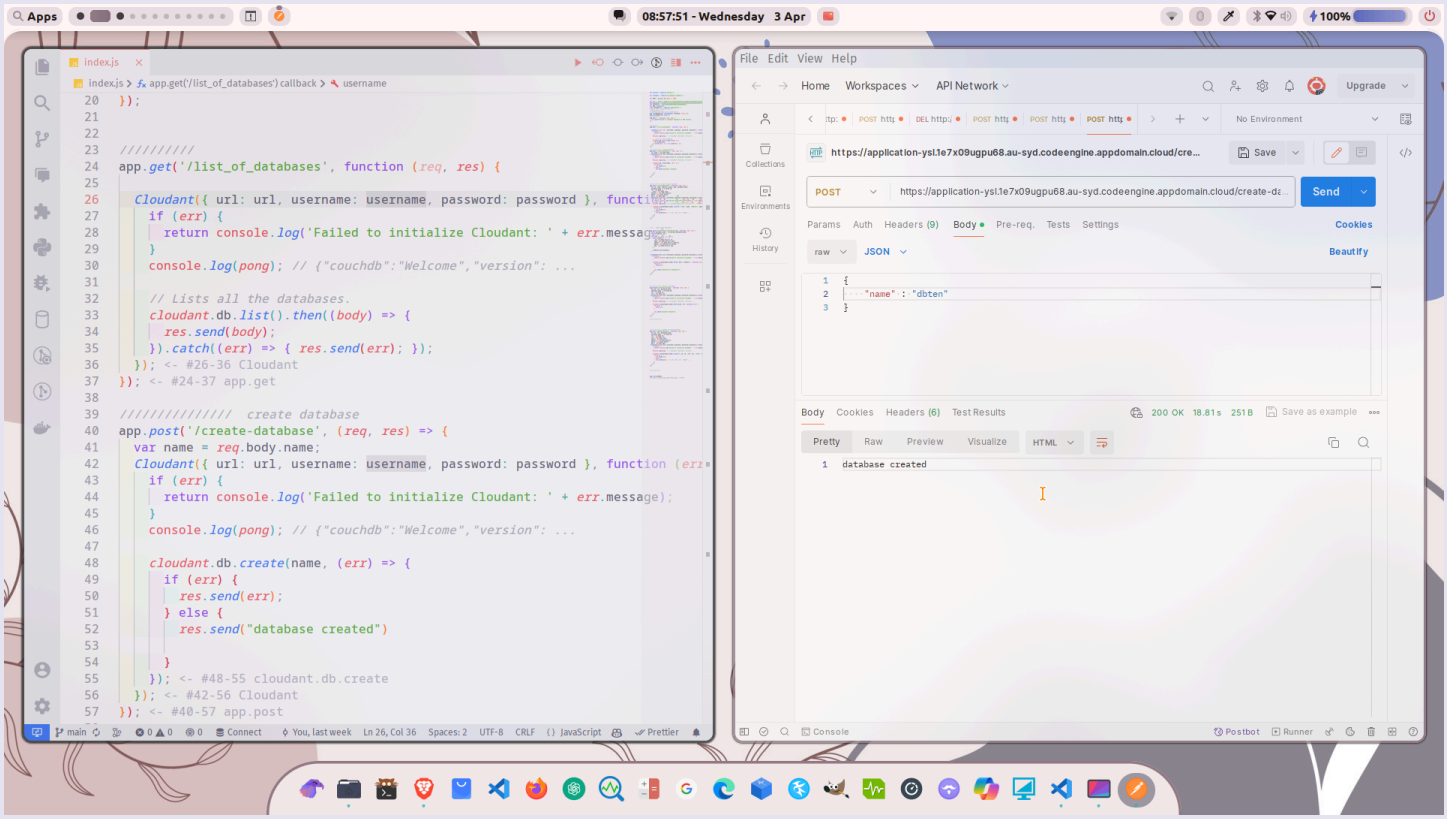
13. For creating the new database on Cloudant



Request : POST
URL : {appdomain}/create-database

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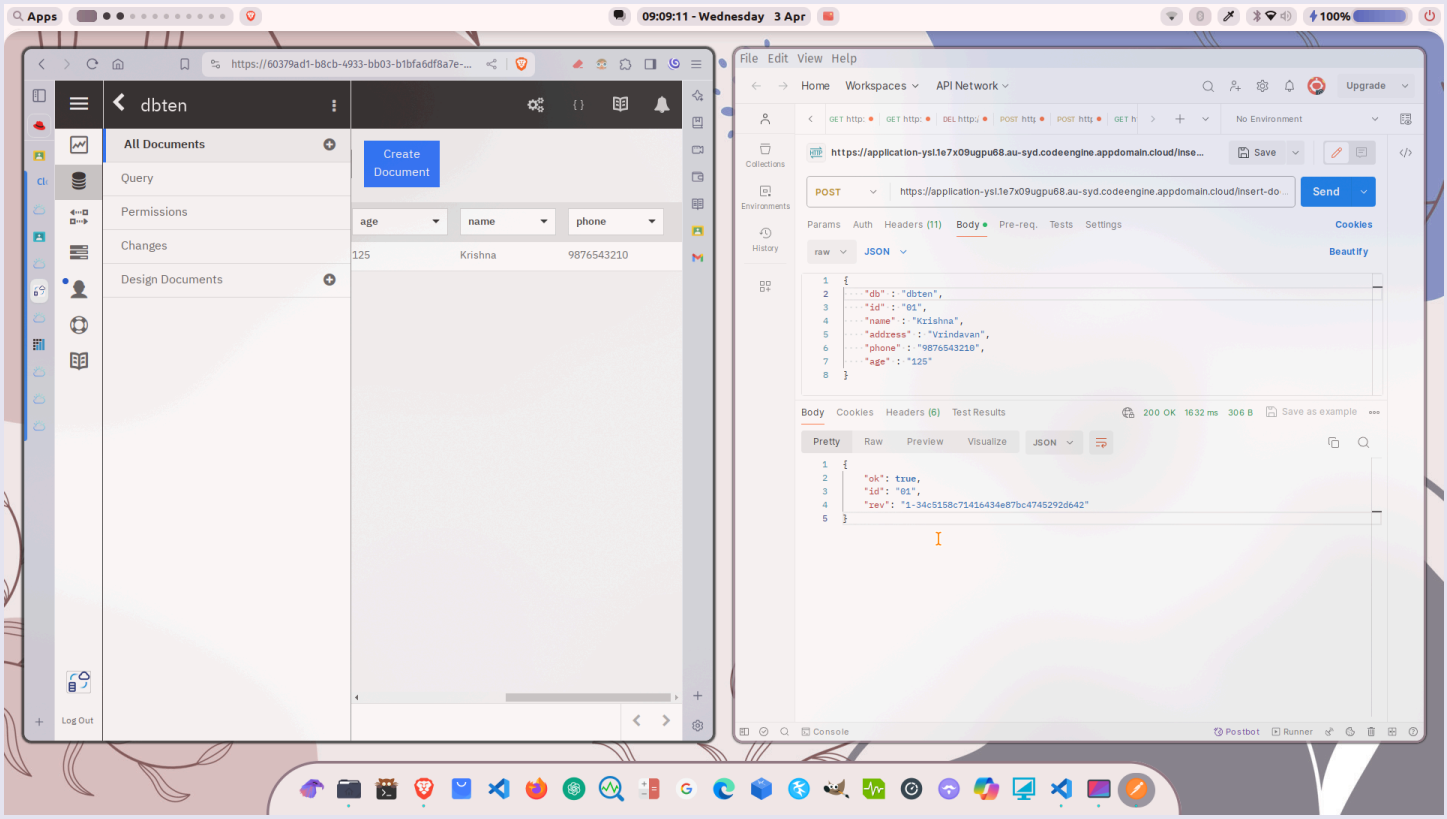
14. For adding the single document to the database



Request : POST
URL : {appdomain}/insert-document
Body : required fields in json format

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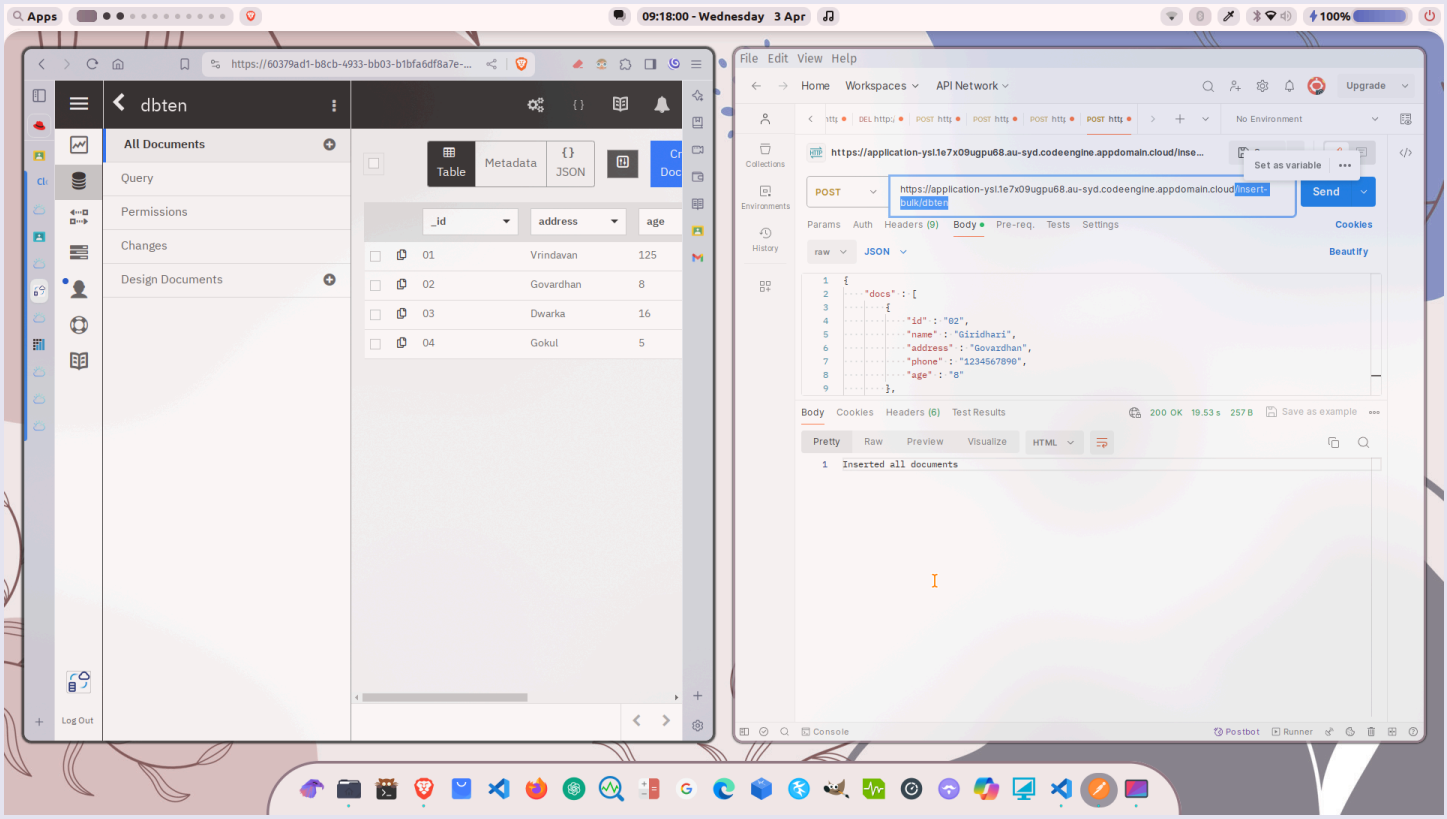
15. For adding bulk documents, like say 3 in this case



Request : POST
URL : {appdomain}/insert-bulk/:database-name
Param : database name at end of URL
Body : array of json object of required fields as value of “docs” key in root json object

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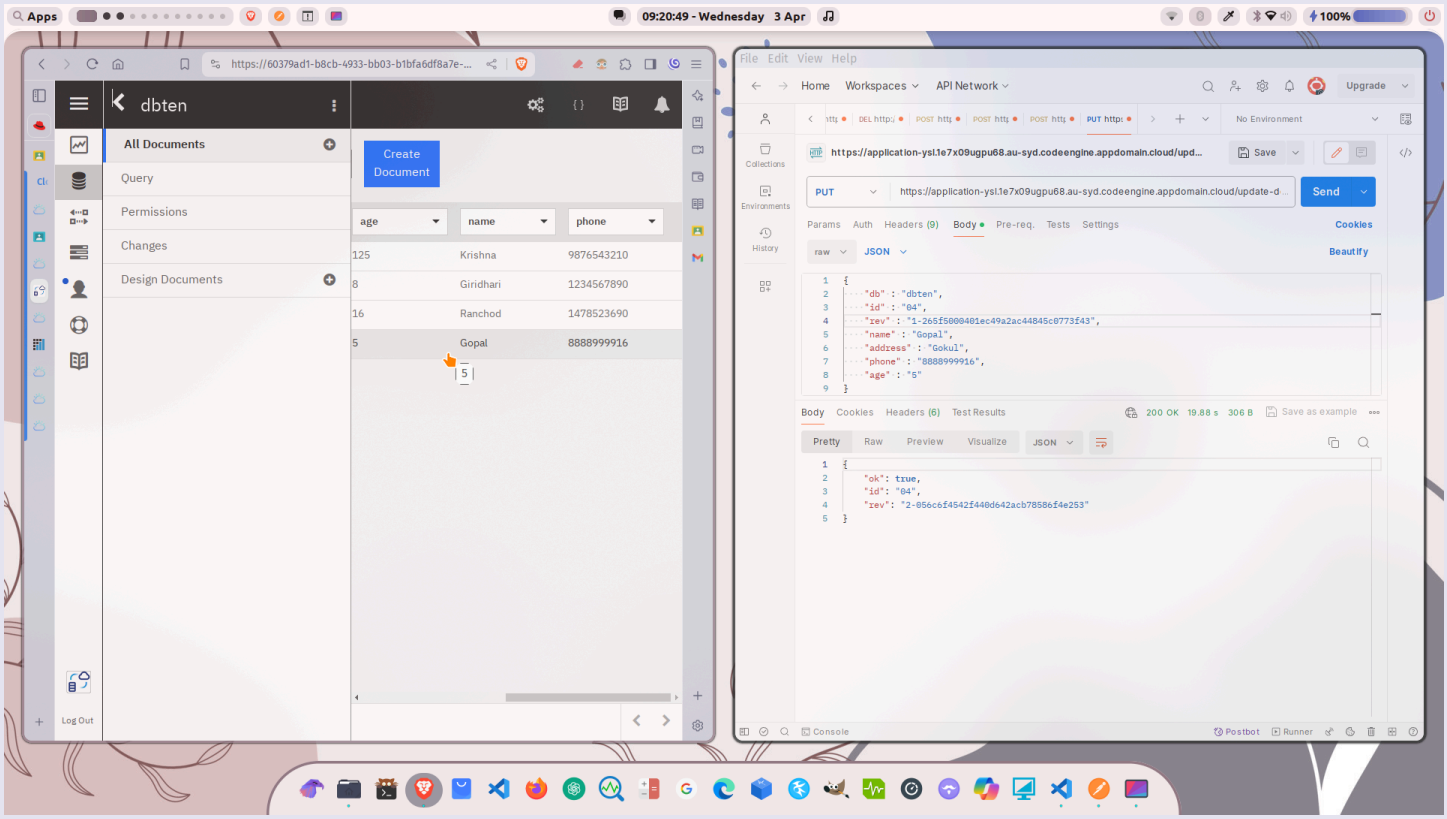
16. For updating the data of a single document



Request : PUT
URL : {appdomain}/update-document
Body : required fields in json format

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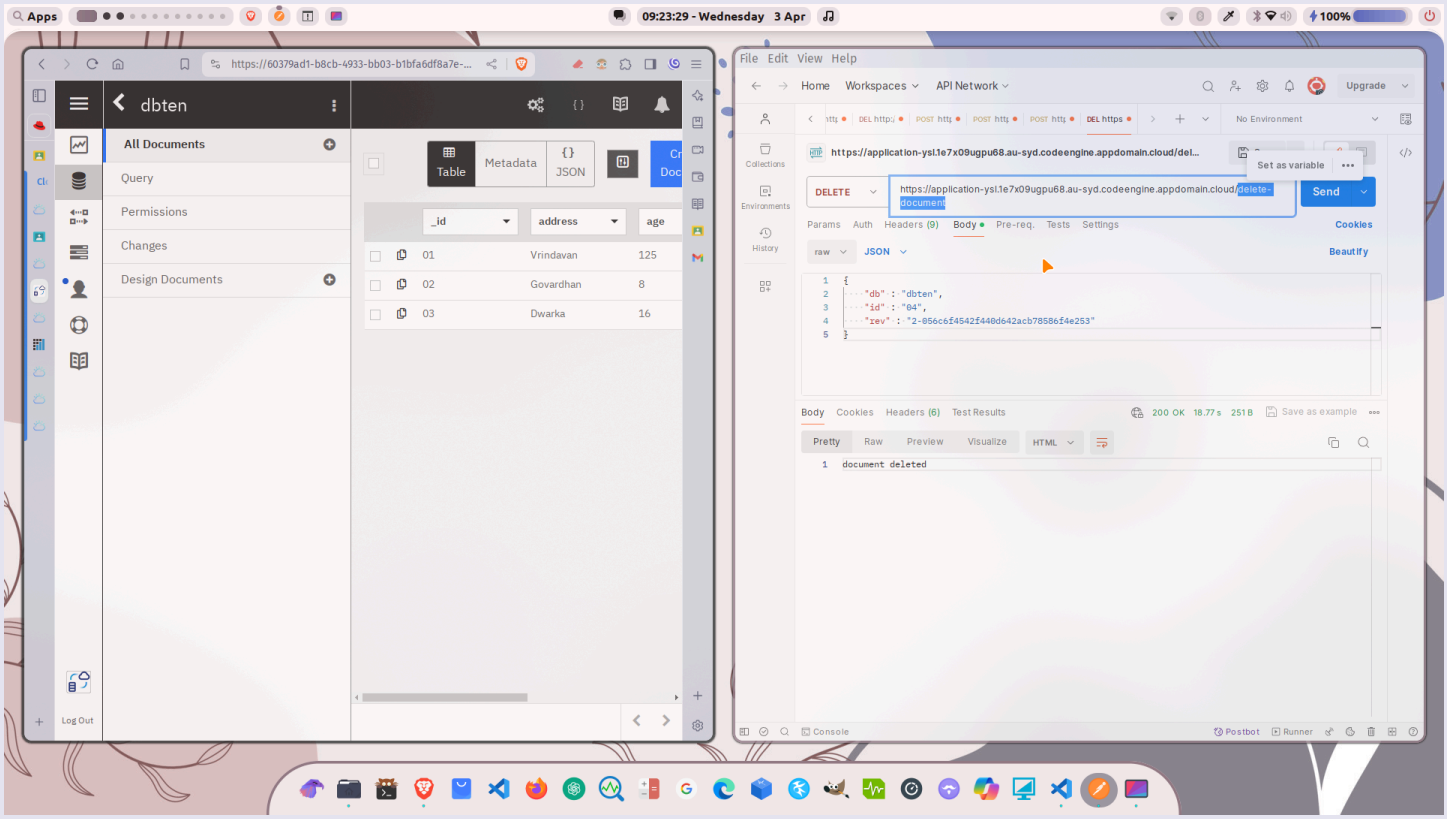
17. For deleting the document from database



Request : DELETE
URL : {appdomain}/delete-document
Body : database-name, id and rev fields in json object

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TASK: Create a sample HTML form to collect data from the user for registration including fields like name, phone number, email address, city, country, pincode. Integrate it with node js application to collect the data from the form and update the same data on cloudant database.

Additional code in previous index.js code :

```
app.use(express.static('public'));
app.use(express.urlencoded({ extended: true }));

//////////////
app.post('/html-insert', function (req, res) {
 var name = req.body.name;
 var phone = req.body.phone;
 var email = req.body.email;
 var city = req.body.city;
 var country = req.body.country;
 var pincode = req.body.pincode;
 var database_name = 'dbten';

 Cloudant({ url: url, username: username, password: password }, function
(err, cloudant, pong) {
   if (err) {
     return console.log('Failed to initialize Cloudant: ' + err.message);
   }
   console.log(pong);

   cloudant.use(database_name).insert({ "name": name, "phone": phone,
"email": email, "city": city, "country": country, "pincode": pincode },
(err, data) => {
     if (err) {
       res.send(err);
     } else {
```

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```
        res.send(data);
      }
    });
  });
});
```

HTML Code :

```
<!DOCTYPE html>
<html>

<head>
    <style>
        body {
            font-family: 'Roboto', sans-serif;
            padding: 20px;
            background-color: #F5F5F5;
        }

        form {
            display: flex;
            flex-direction: column;
            width: 300px;
            margin: auto;
        }

        label {
            margin: 10px 0 5px 0;
            color: #b75969;
        }

        input[type="text"] {
```

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```
            padding: 10px;
            border: none;
            border-radius: 4px;
            box-shadow: 0 2px 2px 0 rgba(0, 0, 0, 0.14), 0 1px 5px 0
rgba(0, 0, 0, 0.12), 0 3px 1px -2px rgba(0, 0, 0, 0.2);
        }

        input[type="submit"] {
            margin-top: 20px;
            padding: 10px;
            border: none;
            color: white;
            background-color: #b75969;
            border-radius: 4px;
            cursor: pointer;
            transition: background-color 0.3s ease;
        }

        input[type="submit"]:hover {
            background-color: #8b3e4a;
        }
    </style>
</head>

<body>
    <!DOCTYPE html>
    <html>

    <head>
        <style>
            body {
                font-family: 'Roboto', sans-serif;
                padding: 20px;
```

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```
            background-color: #F5F5F5;
        }

        form {
            display: flex;
            flex-direction: column;
            width: 300px;
            margin: auto;
        }

        label {
            margin: 10px 0 5px 0;
            color: #b75969;
        }

        input[type="text"] {
            padding: 10px;
            border: none;
            border-radius: 4px;
            box-shadow: 0 2px 2px 0 rgba(0, 0, 0, 0.14), 0 1px 5px 0
rgba(0, 0, 0, 0.12), 0 3px 1px -2px rgba(0, 0, 0, 0.2);
        }

        input[type="submit"] {
            margin-top: 20px;
            padding: 10px;
            border: none;
            color: white;
            background-color: #b75969;
            border-radius: 4px;
            cursor: pointer;
            transition: background-color 0.3s ease;
        }
```

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```
            input[type="submit"]:hover {
                background-color: #8b3e4a;
            }
        </style>
    </head>

    <body>
        <form action="/html-insert" method="post">
            <label for="name">Name:</label>
            <input type="text" id="name" name="name">
            <label for="phone">Phone:</label>
            <input type="text" id="phone" name="phone">
            <label for="email">Email:</label>
            <input type="text" id="email" name="email">
            <label for="city">City:</label>
            <input type="text" id="city" name="city">
            <label for="country">Country:</label>
            <input type="text" id="country" name="country">
            <label for="pincode">Pincode:</label>
            <input type="text" id="pincode" name="pincode">
            <input type="submit" value="Submit">
        </form>
    </body>

    </html>
</body>

</html>
```

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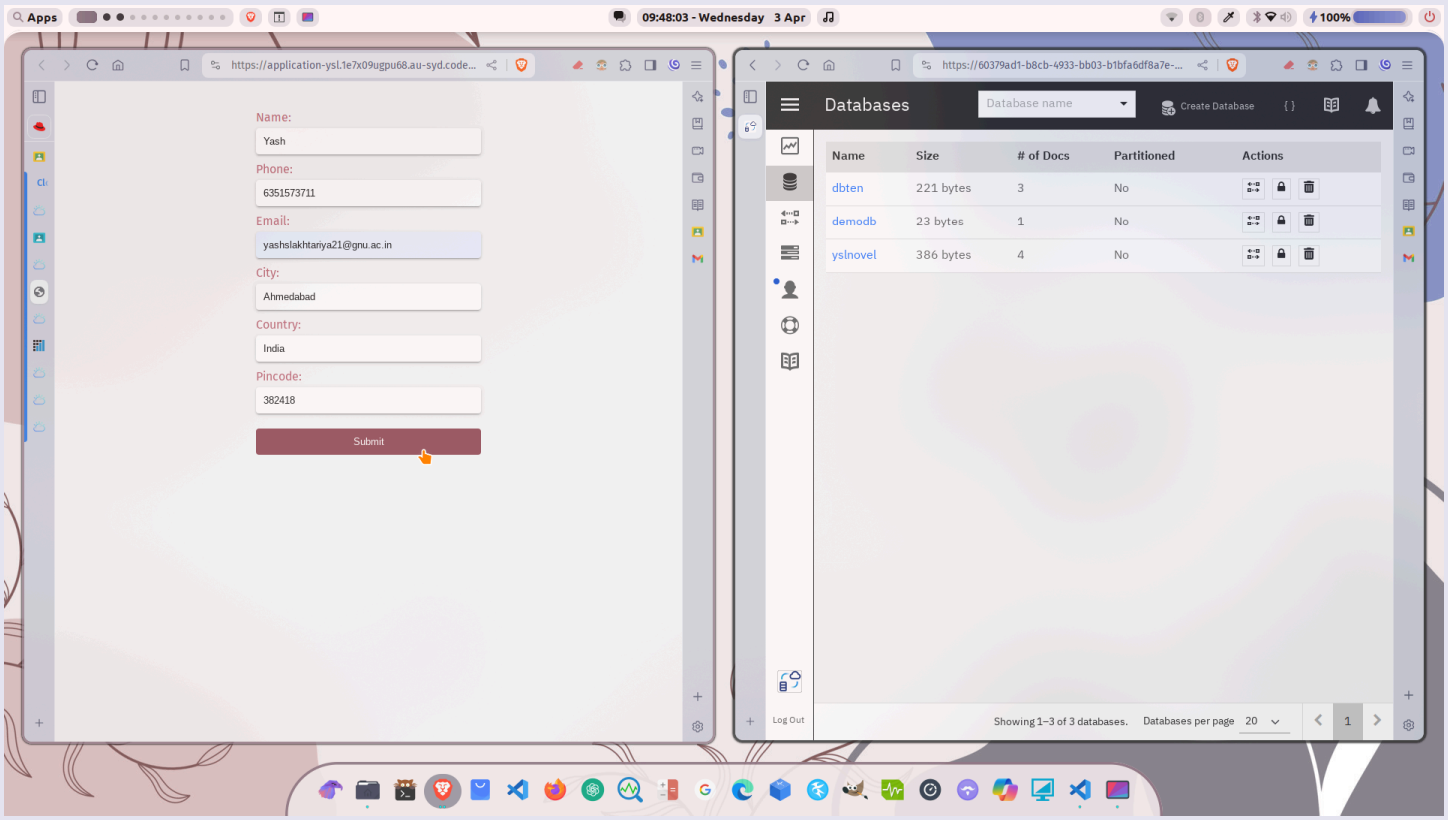
- After updating the code and pushing on Github, rerun build in Configuration of the Code Engine application and visit the URL



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- As seen the data is added (as ID isn't specified, it creates automatically)