

A project report on

PRIVACY PRESERVING DATA SECURITY MODEL IN MYSQL USING AES ALGORITHM

Submitted in partial fulfilment for the award of the degree of

M. Tech (Software Engineering)

By

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INFORMATION SYSTEMS**

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ABSTRACT

New Advances in Cloud Computing Technology Enable rapid use of cloud platforms for business purposes it is increasing day by day. Aggregating data about companies Transactions, communications, business model architecture, etc. A lot of other information is stored on cloud platforms, Visit our business partners in Dubai together. Under consideration Security aspects of data stored in the cloud must be high Protected and accessible by authentication. Was suggested this system focuses on evaluating the integrity monitoring model of the cloud where security and data protection systems are located if checked, algorithms are used to determine data protection. The proposed model is developed using Cryptographic Algorithms where input data is stored in the cloud Bring Your Own Encryption Key (BYOEK) platform. Or the safety of the BYOEK model has been evaluated and verified from the following perspectives. For a given test model in terms of comparison of execution time and data trading.

6.2 SAMPLE OUTPUT:

Home Page:

The screenshot shows the homepage of a web application titled "Privacy Preserving Data Security". The header includes a logo, the title, and navigation links for Home, Data Owner, Data User, Auditor, and Admin. Below the header is a main banner with the title "Privacy Preserving Data Security" and a subtitle explaining the evolution of cloud computing and its security challenges. A "Get Started" button is located below the banner. The central area features a collage of images related to data security, including a bar chart, a server tower with a padlock, and various digital icons.

CLOUD FEATURES

This section highlights five key features of the cloud solution:

- Smooth Design**: Implementing AES Algorithm For Privacy Preservation In Cloud-Based Data Security Models Enhances Website Design With Robust Features, Ensuring Smooth Operations While Safeguarding Sensitive Information.
- Privacy Protect**: Integrating AES Algorithm Into Cloud-Based Data Security Models Ensures Privacy Protection, Enhancing Website Design With Cloud Features For Seamless Operations While Safeguarding Sensitive Information.
- Multiple Language**: Integrating AES Algorithm Into A Cloud-Based Privacy-Preserving Data Security Model Amplifies Website Functionality, Allowing Multiple Languages Utilizing HTML, CSS, JS For Front End And J2EE (SPF Servlets) For Back End Ensures Comprehensive Protection And Seamless User Experience.
- Location Tracking**: Integrating AES Algorithm In A Privacy-Preserving Data Security Model For Cloud-Based Location Tracking With Off-Grid Enhanced Features, Ensuring Robust Protection Of Sensitive Information While Maintaining Smooth Functionality.
- Powerfull Settings**: Employing AES Algorithm For Privacy Preservation In Cloud-Based Data Security Models Empowers Websites With Robust Features, Insuring Powerful Settings For Enhanced Data Protection And Smooth Operations.

24 X 7 Service

"Integration of AES Algorithm Within A Privacy-Preserving Data Security Model For Cloud Services Ensures 24x7 Website Availability With Enhanced Protection, Empowering Seamless Operations While Safeguarding Sensitive Information."

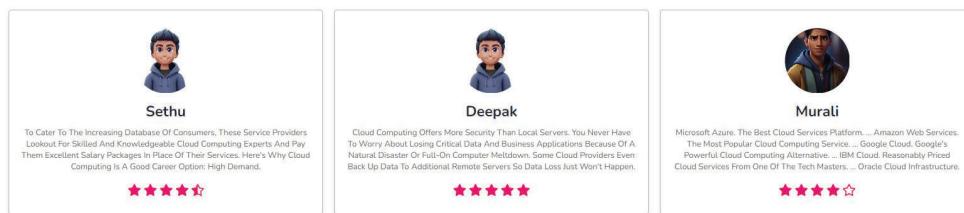
ABOUT THE CLOUD COMPUTING



Take A Look About Cloud Computing

"Experience Unparalleled Data Security With Our Privacy Preserving Data Security Model In PCloud. Our Cutting-Edge Solution Employs Advanced Encryption, Access Control Mechanisms, And Anonymization Techniques To Safeguard Your Sensitive Information. Enjoy Peace Of Mind Knowing That Your Data Is Protected Against Unauthorized Access Or Breaches. With Our Robust Security Measures, You Retain Full Control Over Your Privacy While Leveraging The Benefits Of Cloud Computing. Trust In Our Commitment To Ensuring The Confidentiality And Integrity Of Your Data. Elevate Your Cloud Experience With PCloud's Unparalleled Privacy-Preserving Solutions."

REVIEWS



GET IN TOUCH

A contact form with fields for Name, Email, Number, and Message, followed by a Send Message button. Below the form are social media sharing icons (Facebook, Twitter, LinkedIn, Instagram) and a "Created By @2024 | All Rights Reserved!" footer. The bottom of the screen shows a Windows taskbar with various pinned icons and system status indicators.

Name: _____
Email: _____
Number: _____
Message: _____

Send Message

f t i n

Created By @2024 | All Rights Reserved!

29°C Partly cloudy Search ENG IN 2028 09-04-2024

6.2.1 Data Owner Models:

Data Owner Login Page:

A screenshot of a web browser showing the "Data Owner | Register" page at localhost:8098/Dynamic_Data_Auditing/OwnerLogin.jsp. The page has two tabs: "Login" and "Register". It contains two input fields for "Username" and "Password", and a "LOG IN" button. The browser's address bar shows the URL. The bottom of the screen shows a Windows taskbar with various pinned icons and system status indicators.

29°C Partly cloudy Search ENG IN 2028 09-04-2024

Data Owner Register Page:

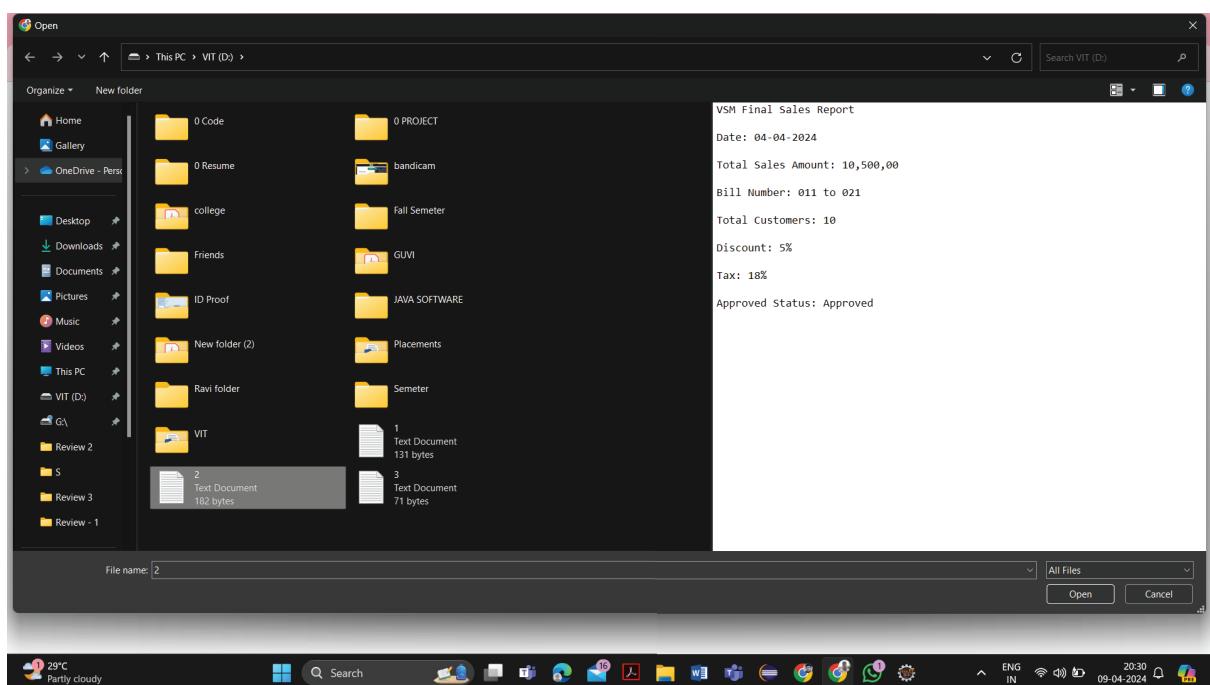
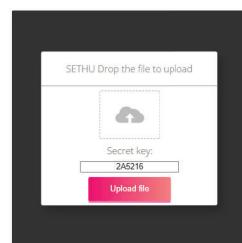
The screenshot shows a web browser window titled "Data Owner | Register". The URL in the address bar is "localhost:8098/Dynamic_Data_Auditing/OwnerLogin.jsp". The page contains a registration form with the following fields: Name, Username, Password, Confirm Password, Email, Contact Number, and Address. A green "REGISTER NOW" button is at the bottom right of the form.



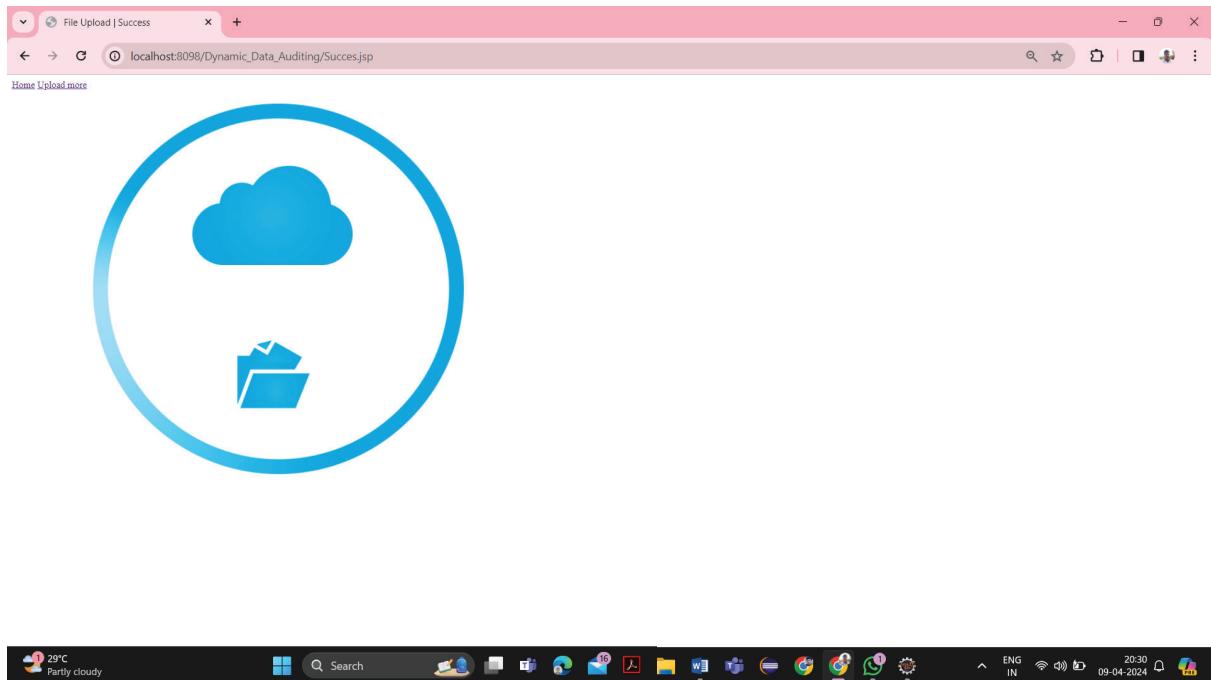
Data Owner Home Page:

The screenshot shows a web browser window titled "Data Owner | Home". The URL in the address bar is "localhost:8098/Dynamic_Data_Auditing/OwnerHome.jsp". The page has a dark header with the text "Data Owner Module @ SETHU". Below the header, there is a main banner with the title "Privacy Preserving Data Security" and a subtext about cloud computing and data storage. A "Get Started" button is located below the banner. The background features a collage of various digital and cloud-related images, including a padlock, binary code, clouds, and network nodes. The bottom of the screen shows the same Windows taskbar as the previous screenshot.

Data Owner uploads the file to the cloud Page:



Data Owner uploads Successful:

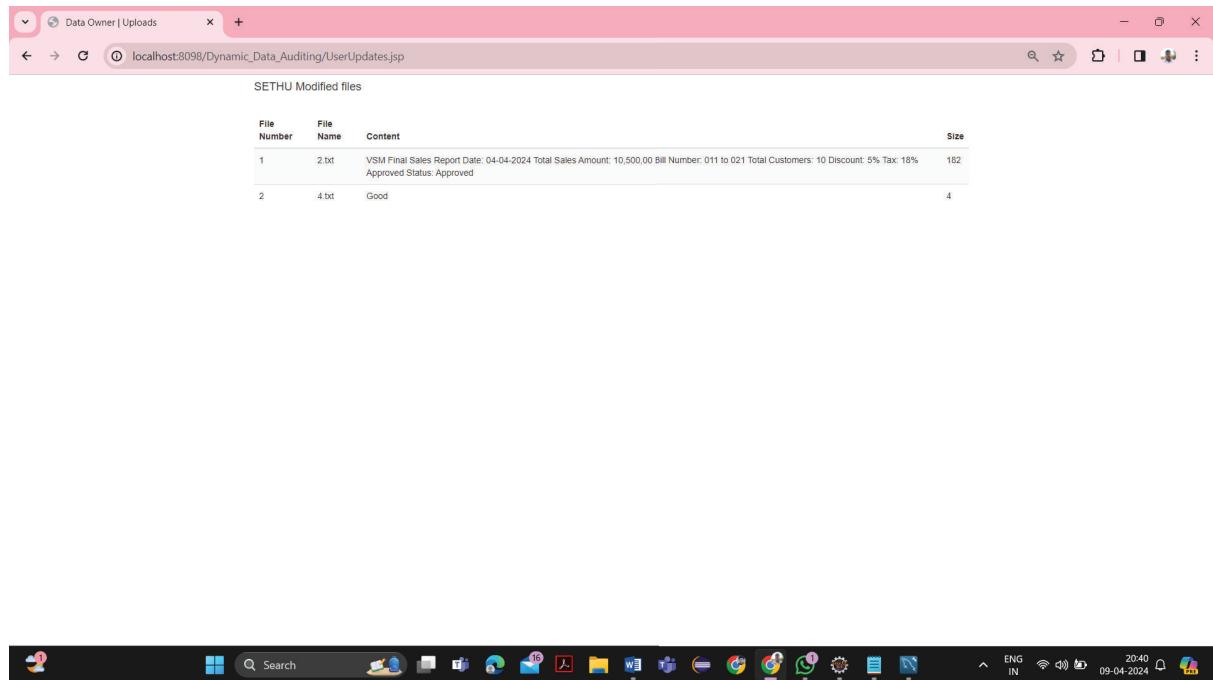


Data Owner View Files:

A screenshot of a web browser window titled "Data Owner | Uploads". The address bar shows "localhost:8098/Dynamic_Data_Auditing/Table.jsp". The page displays a table with the following data:

File Number	File Name	File Type	File Size	Secret Key
1	1.txt	text/plain	173	90DC14
2	SS.txt	text/plain	73	219EF2
3	1.txt	text/plain	131	BCCC95
4	1.txt	text/plain	131	A4363E
5	2.txt	text/plain	182	2A5216

Data User Modified Page:

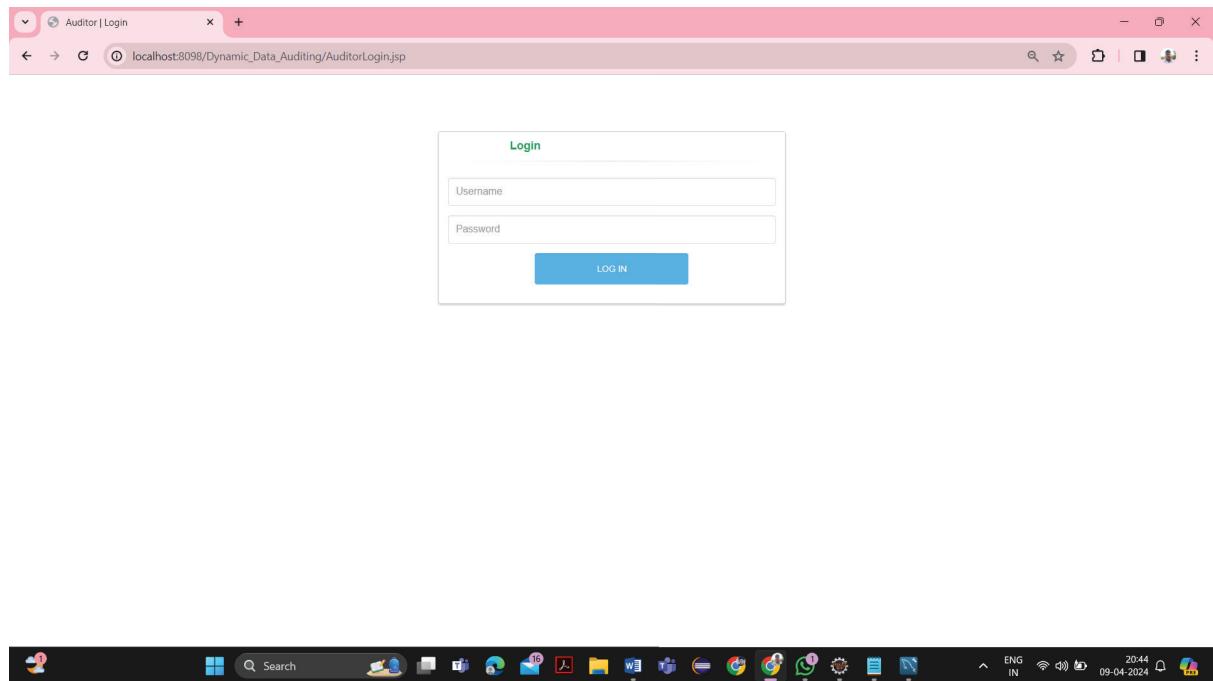


A screenshot of a web browser window titled "Data Owner | Uploads". The address bar shows "localhost:8098/Dynamic_Data_Auditing/UserUpdates.jsp". The content area displays a table titled "SETHU Modified files".

File Number	File Name	Content	Size
1	2.txt	VSM Final Sales Report Date: 04-04-2024 Total Sales Amount: 10,500.00 Bill Number: 011 to 021 Total Customers: 10 Discount: 5% Tax: 18% Approved Status: Approved	162
2	4.txt	Good	4

6.2.2 Auditor Models:

Auditor Login Page:



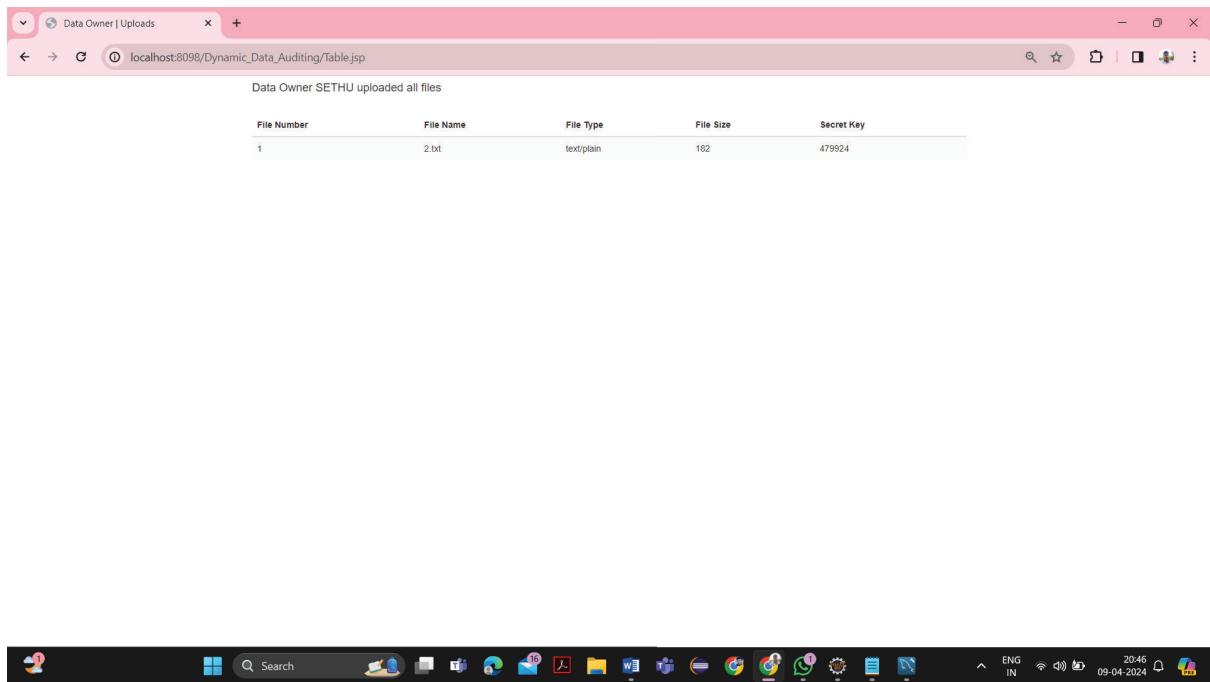
A screenshot of a web browser window titled "Auditor | Login". The address bar shows "localhost:8098/Dynamic_Data_Auditing/AuditorLogin.jsp". The content area displays a login form with the title "Login".

The login form contains two input fields: "Username" and "Password", and a blue "LOG IN" button.

Auditor Home Page:



Track Files:



File Request:

A screenshot of a web browser window titled "Data User | File Request". The URL is "localhost:8098/Dynamic_Data_Auditing/UserFileRequest.jsp". The page displays a table titled "Requested Files" with one row of data:

File Number	File Name	File Size	Request By	Status	Action
1	2.txt	182	sethu	Waiting	Accept

The browser's taskbar at the bottom shows various application icons.

Accepted File Request:

A screenshot of a web browser window titled "Insert title here". The URL is "localhost:8098/Dynamic_Data_Auditing/FileAcceptSuccess.jsp". The page displays a message "File Accepted Successfully" above a large green circle containing a white checkmark.

The browser's taskbar at the bottom shows various application icons.

User Modified Page:

localhost:8098/Dynamic_Data_Auditing/UserUpdates.jsp

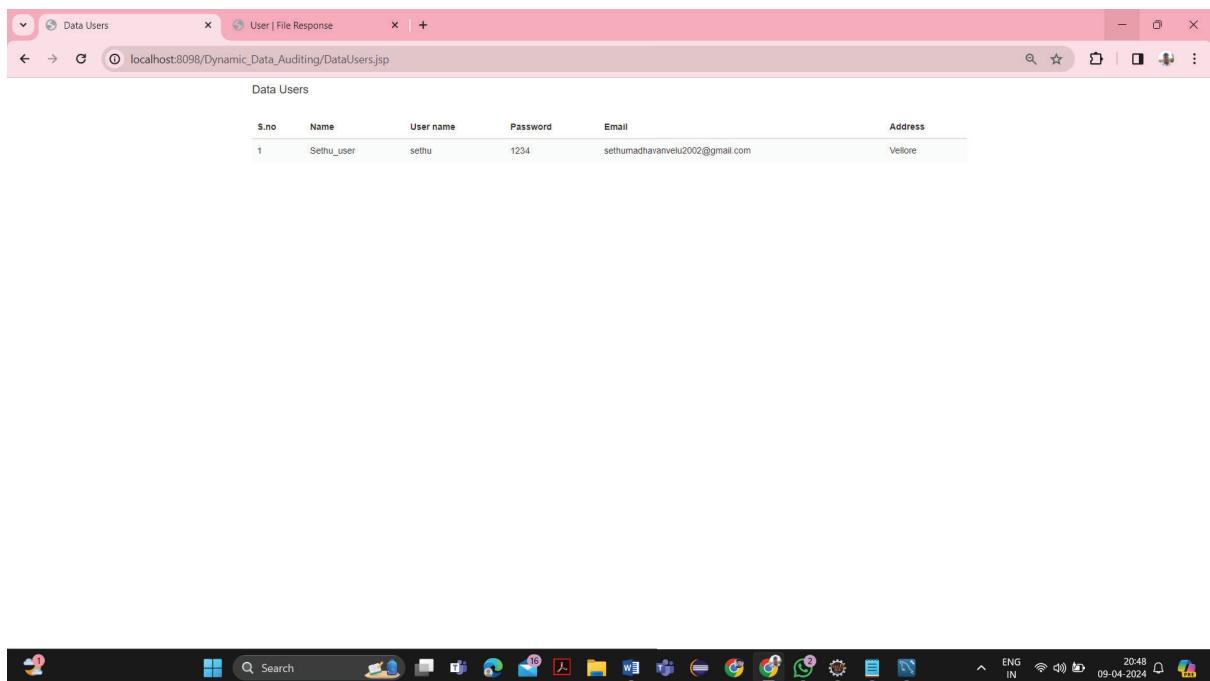
File Number	File Name	Content	Size
1	2.txt	VSM Final Sales Report Date: 04-04-2024 Total Sales Amount: 10,500.00 Bill Number: 011 to 021 Total Customers: 10 Discount: 5% Tax: 18% Approved Status: Approved	162
2	4.txt	Good	4

View the list of login details of data owners:

localhost:8098/Dynamic_Data_Auditing/DataOwners.jsp

S.no	Name	User name	Password	Email	Address
1	Madhavan_D_O	Madhavan	5678	madhavando@gmail.com	Chennai

View the list of login details of Data User:



A screenshot of a web browser window titled "Data Users". The URL is "localhost:8098/Dynamic_Data_Auditing/DataUsers.jsp". The page displays a table with one row of data:

S.no	Name	User name	Password	Email	Address
1	Sethu_user	sethu	1234	sethumadhavanvelu2002@gmail.com	Vellore

6.2.3. Data User:

Data User Home Page:



A screenshot of a web browser window titled "Data User | Home". The URL is "localhost:8098/Dynamic_Data_Auditing/UserHome.jsp". The page has a dark theme with a header "Data User Module" and navigation links: Home, File Response, Download File, Dynamic Operation, Log Out.

Privacy Preserving Data Security

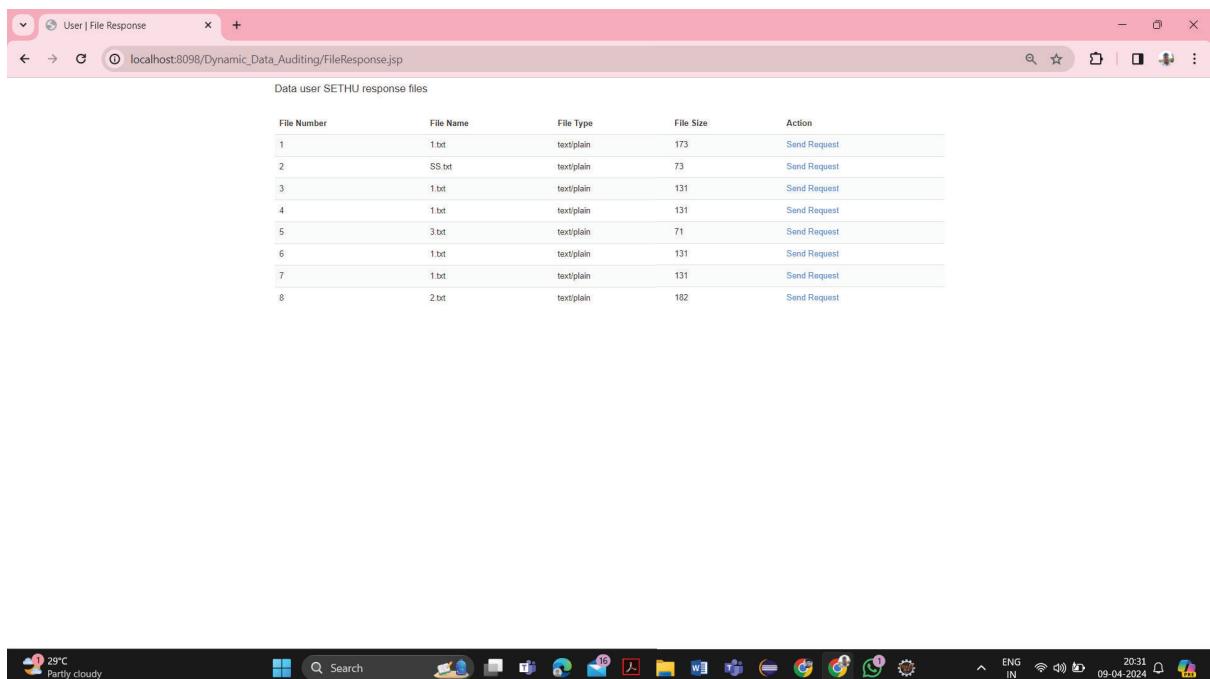
Cloud Computing Is An Evolving Technology That Provides Data Storage And Highly Fast Computing Services At A Very Low Cost. All Data Stored In The Cloud Is Handled By Their Cloud Service Providers Or The Caretaker Of The Cloud.

The Data Owner Is Concerned About The Authenticity And Reliability Of The Data Stored In The Cloud As The Data Owners. Data Can Be Misappropriated Or Altered By Any Unauthorized User Or Person!

[Get Started](#)

29°C Partly cloudy

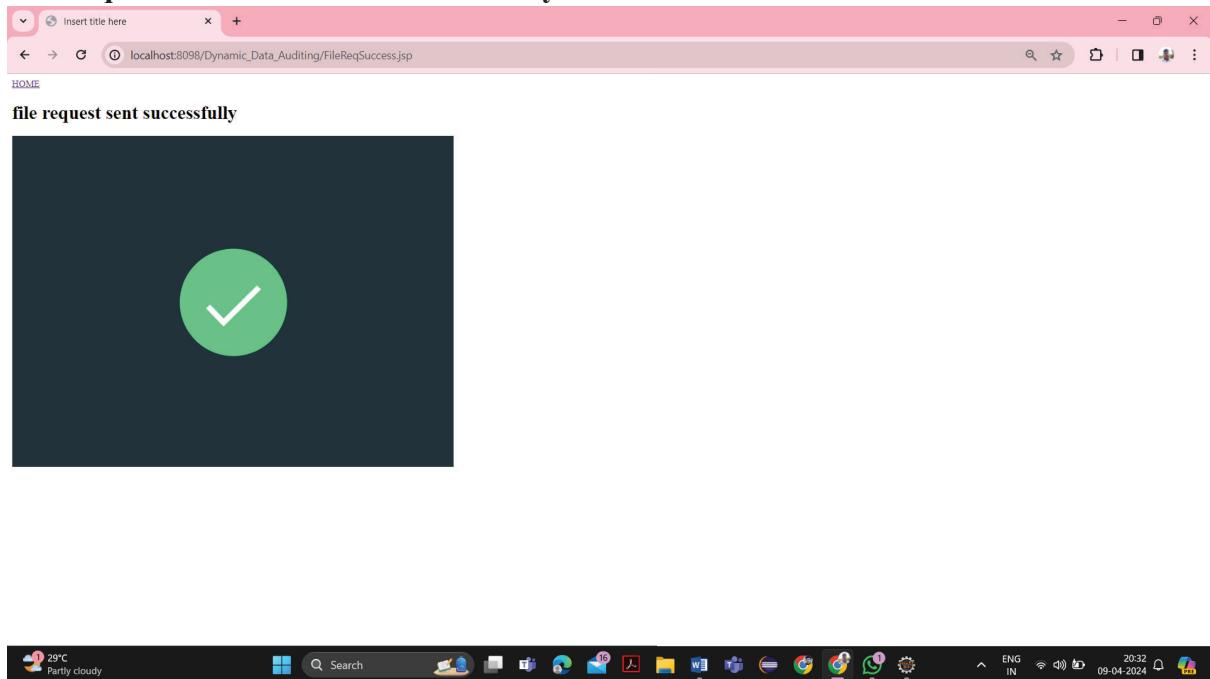
Request to send Auditor for Data Owner file:



A screenshot of a web browser window titled "User | File Response". The address bar shows "localhost:8098/Dynamic_Data_Auditing/FileResponse.jsp". The page content is titled "Data user SETHU response files" and displays a table with the following data:

File Number	File Name	File Type	File Size	Action
1	1.txt	text/plain	173	Send Request
2	SS.txt	text/plain	73	Send Request
3	1.txt	text/plain	131	Send Request
4	1.txt	text/plain	131	Send Request
5	3.txt	text/plain	71	Send Request
6	1.txt	text/plain	131	Send Request
7	1.txt	text/plain	131	Send Request
8	2.txt	text/plain	182	Send Request

File request for auditor sent successfully:



A screenshot of a web browser window titled "Insert title here". The address bar shows "localhost:8098/Dynamic_Data_Auditing/FileReqSuccess.jsp". The page content is titled "HOME" and displays the message "file request sent successfully" above a large green circle containing a white checkmark.

Download File:

A screenshot of a web browser window titled "Download File". The address bar shows "localhost:8098/Dynamic_Data_Auditing/UserDownloadFiles.jsp". The page title is "Requested Files to Download SETHU". A table lists seven files with columns: File Number, File Name, File Size, Secret Key, Data Owner, and Action (Download). The files are: 1.txt (173 bytes, 2CA59E, sethu), SS.txt (73 bytes, 219EF2, sethu), SS.txt (73 bytes, 219EF2, sethu), 1.txt (131 bytes, 2CA59E, Madhavan), 1.txt (173 bytes, 2CA59E, sethu), 1.txt (131 bytes, 2CA59E, Madhavan), and 1.txt (131 bytes, 2CA59E, Madhavan).

File Number	File Name	File Size	Secret Key	Data Owner	Action
1	1.txt	173	2CA59E	sethu	Download
2	SS.txt	73	219EF2	sethu	Download
3	SS.txt	73	219EF2	sethu	Download
4	1.txt	131	2CA59E	Madhavan	Download
5	1.txt	173	2CA59E	sethu	Download
6	1.txt	131	2CA59E	Madhavan	Download
7	1.txt	131	2CA59E	Madhavan	Download

Alert Message:

A screenshot of a web browser window titled "User | File Response". The address bar shows "localhost:8098/Dynamic_Data_Auditing/UserDownloadFiles.jsp". The page title is "Requested Files to Download SETHU". A table lists one file: 2.txt (182 bytes, 479924, sethu, Action: Download). A modal dialog box titled "Alert" with the message "Enter the secret key" and an "OK" button is overlaid on the page.

File Number	File Name	File Size	Secret Key	Data Owner	Action
1	2.txt	182	479924	sethu	Download

Enter the Secret Key:

A screenshot of a web browser window titled "User | File Response". The address bar shows "localhost:8098/Dynamic_Data_Auditing/UserDownloadFiles.jsp". The page title is "Requested Files to Download SETHU". A table lists one file: 2.txt (182 bytes, 479924, sethu, Action: Download). An input dialog box titled "Input" with the message "Enter the secret key" and a text field containing "479924" is overlaid on the page.

File Number	File Name	File Size	Secret Key	Data Owner	Action
1	2.txt	182	479924	sethu	Download

Cloud finally they can download required file:

A screenshot of a web browser window titled "Download File". The address bar shows "localhost:8098/Dynamic_Data_Auditing/UserDownloadFiles.jsp". The page title is "Requested Files to Download SETHU". A table lists one file: 2.txt (182 bytes, 479924, sethu, Action: Download). A download progress bar for "2.txt" is shown at the top right, indicating "182 B + Done".

File Number	File Name	File Size	Secret Key	Data Owner	Action
1	2.txt	182	479924	sethu	Download

Dynamic Operation:

A screenshot of a web browser window titled "Modify Files". The address bar shows "localhost:8098/Dynamic_Data_Auditing/DynamicOperation.jsp". The main content area is titled "Dynamic Operation By SETHU" and displays a table with one row of data:

File Number	File Name	File Size	Secret Key	Data Owner	Action
1	2.txt	182	479924	sethu	Modify

Alert Message:

A screenshot of a web browser window titled "Modify Files". The address bar shows "localhost:8098/Dynamic_Data_Auditing/DynamicOperation.jsp". The main content area is titled "Dynamic Operation By SETHU" and displays a table with one row of data. An "Alert" dialog box is overlaid on the page, prompting for a secret key:

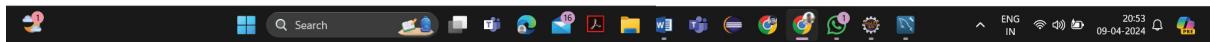
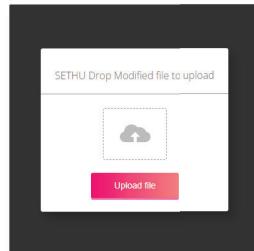
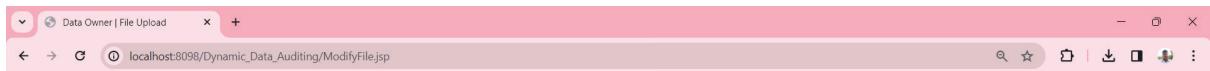
Alert
Enter the secret key
OK

Enter the Secret Key:

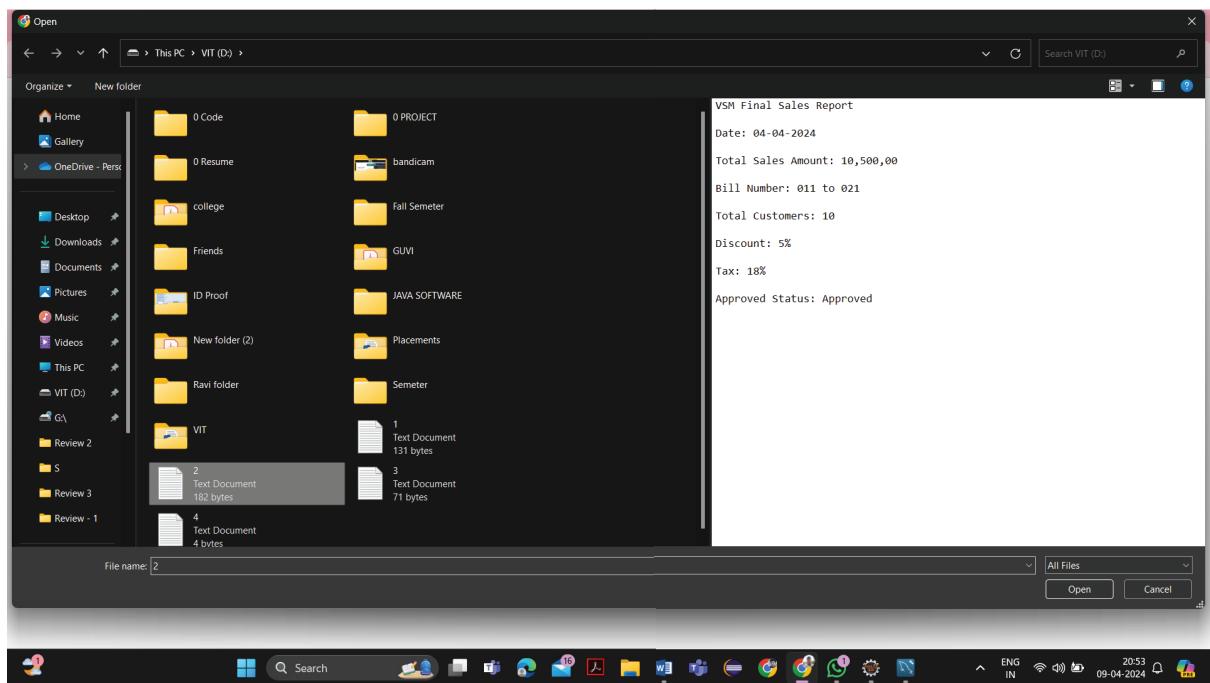
A screenshot of a web browser window titled "Modify Files". The address bar shows "localhost:8098/Dynamic_Data_Auditing/DynamicOperation.jsp". The main content area is titled "Dynamic Operation By SETHU" and displays a table with one row of data. An "Input" dialog box is overlaid on the page, showing the entered secret key:

Input
Enter the secret key
479924
OK Cancel

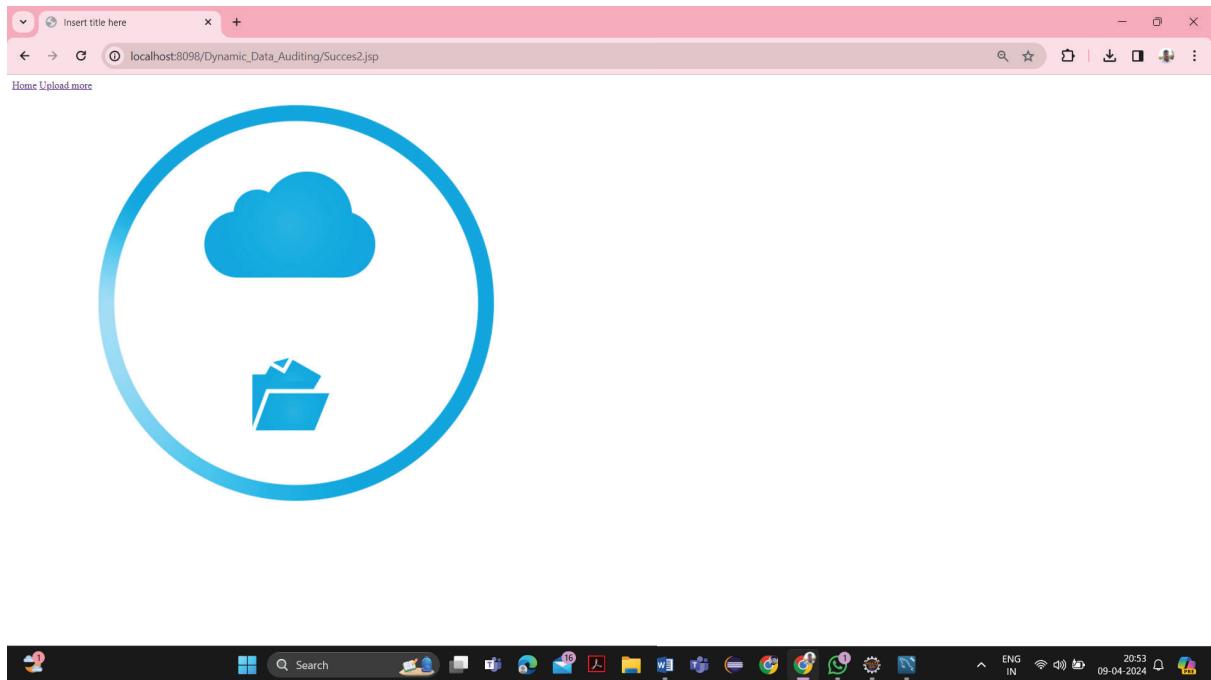
Modified Data Owner File:



Select the modified file for Data User:

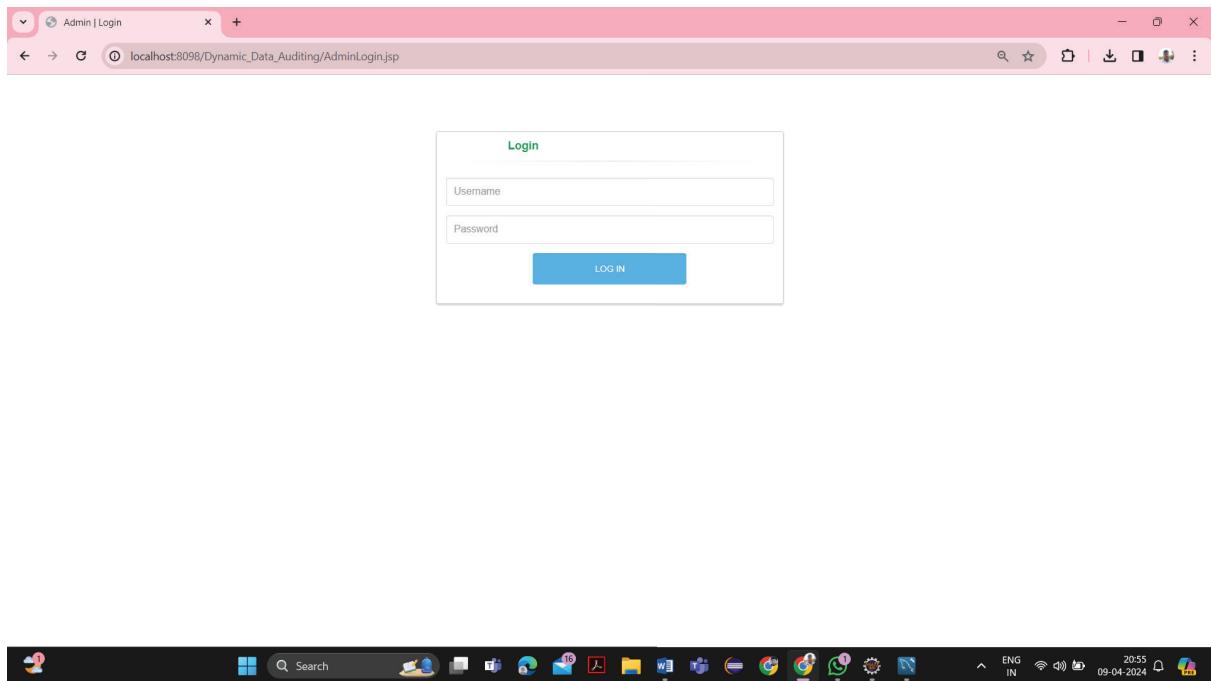


Data User Uploaded File Successfully:



6.2.4 Admin Models:

Admin Login Page:



Administrator Home Page:

The screenshot shows a web browser window titled "Admin | Home" with the URL "localhost:8098/Dynamic_Data_Auditing/AdminHome.jsp". The page has a dark header with the "Admin Module" logo and navigation links: Home, Monitor Data's, User Modified, Data Owners, Data Users, and Log Out. The main content area features a large "Welcome Administrator" heading with a subtext about cloud computing. Below it is a paragraph about data security and a "Get Started" button. The background of the content area is a blue-toned graphic of a network cloud with nodes and connections. At the bottom of the page is a footer bar with various icons and system status indicators.

Monitor Data:

The screenshot shows a web browser window titled "Data Owner | Uploads" with the URL "localhost:8098/Dynamic_Data_Auditing/MonitorData.jsp". The page displays a message "Data Owner SETHU uploaded all files" above a table. The table has columns: File Number, File Name, File Type, File Size, and Secret Key. There is one row of data: File Number 1, File Name 2.txt, File Type text/plain, File Size 182, and Secret Key 479924. The bottom of the page features a standard Windows-style taskbar with various application icons.

User Modified Page:

A screenshot of a web browser window titled "Data Owner | Uploads". The address bar shows "localhost:8098/Dynamic_Data_Auditing/UserUpdates.jsp". The main content area is titled "SETHU Modified files" and displays a table with three rows of file information. The columns are "File Number", "File Name", "Content", and "Size".

File Number	File Name	Content	Size
1	2.txt	VSM Final Sales Report Date: 04-04-2024 Total Sales Amount: 10,500.00 Bill Number: 011 to 021 Total Customers: 10 Discount: 5% Tax: 18% Approved Status: Approved	162
2	4.txt	Good	4
3	2.txt	VSM Final Sales Report Date: 04-04-2024 Total Sales Amount: 10,500.00 Bill Number: 011 to 021 Total Customers: 10 Discount: 5% Tax: 18% Approved Status: Approved	162

Admin View the Data Owner Login Details:

A screenshot of a web browser window titled "Data Owners". The address bar shows "localhost:8098/Dynamic_Data_Auditing/DataOwnersAD.jsp". The main content area is titled "Data Owners" and displays a table with one row of data.

S.no	Name	User name	Password	Email	Address
1	Madhavan_D_O	Madhavan	5678	madhavando@gmail.com	Chennai

Admin View the Data User Login Details:

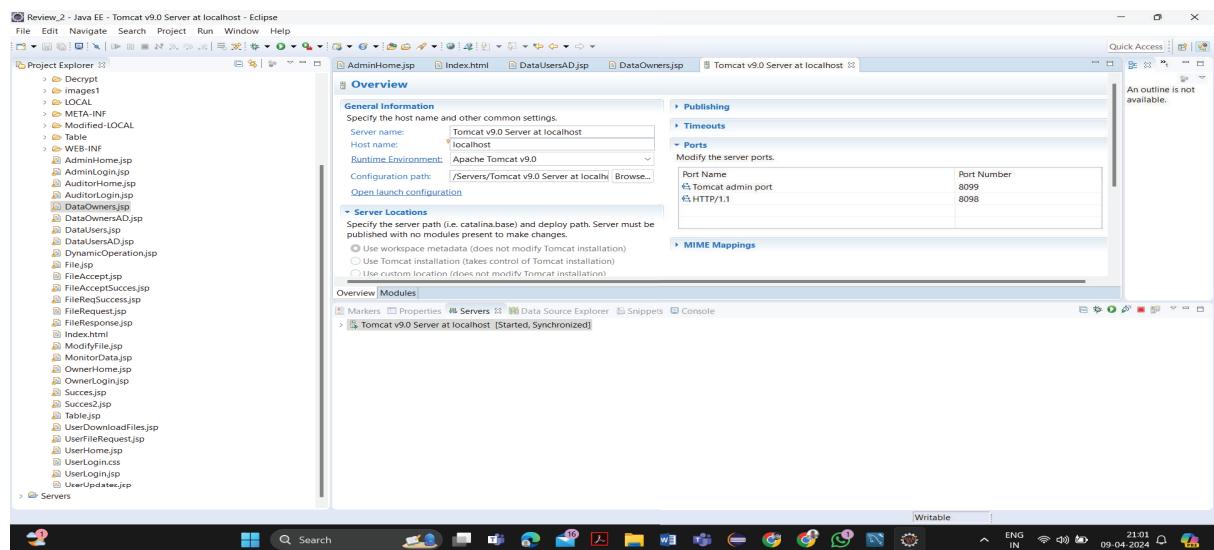
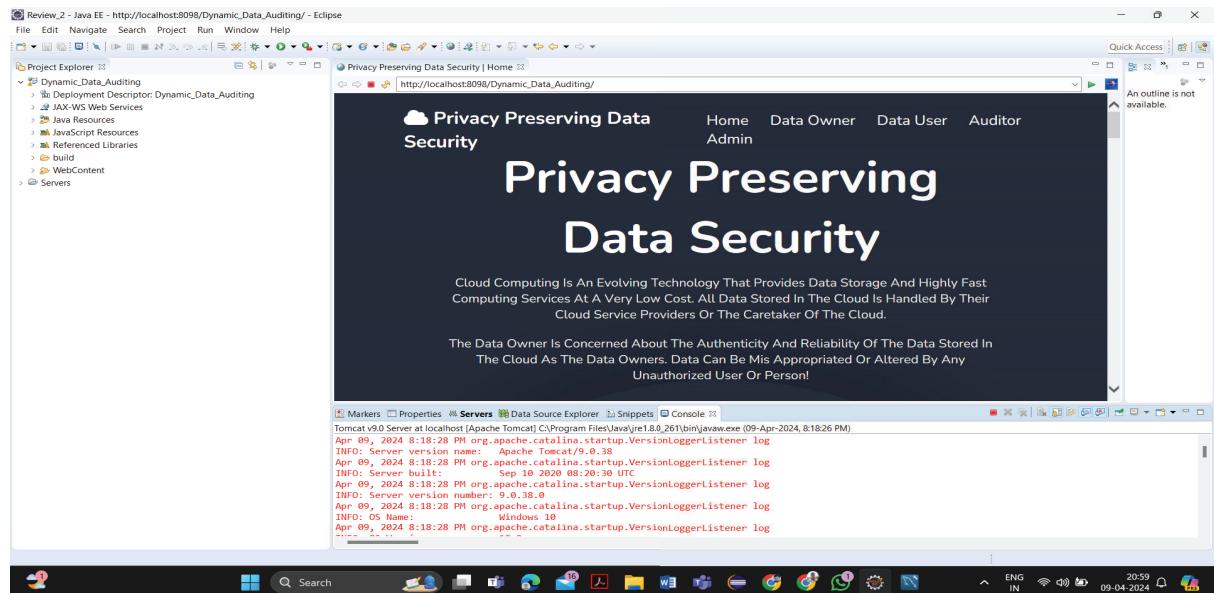
A screenshot of a web browser window titled "Data Users". The address bar shows "localhost:8098/Dynamic_Data_Auditing/DataUsersAD.jsp". The main content area is titled "Data Users" and displays a table with one row of data.

S.no	Name	User name	Password	Email	Address
1	Sethu_user	sethu	1234	sethumadhavanyelu2002@gmail.com	Vellore

Proof Image

```

Review_2 - Java EE - Dynamic_Data_Auditing/WebContent/AdminHome.jsp - Eclipse
File Edit Source Refactor Navigate Search Project Run Window Help
Project Explorer
  - Decrypt
    - images1
  - LOCAL
    - META-INF
    - Modified-LOCAL
    - Table
    - WEB-INF
      - AdminHome.jsp
      - AdminLogin.jsp
      - AuditorHome.jsp
      - AuditorLogin.jsp
      - DataOwnerAD.jsp
      - DataOwner.jsp
      - DataUsers.jsp
      - DataUsersD.jsp
      - DynamicOperation.jsp
      - File.jsp
      - FileAccept.jsp
      - FileAcceptSuccess.jsp
      - FileResponse.jsp
      - FileRequest.jsp
      - FileResponse.jsp
      - Index.jsp
      - ModifyFile.jsp
      - MonitorData.jsp
      - OwnerHome.jsp
      - OwnerLogin.jsp
      - Success.jsp
      - Table.jsp
      - UserDownloadFiles.jsp
      - UserFileRequest.jsp
      - UserHome.jsp
      - UserLogin.css
      - UserLogin.jsp
      - UserUpdate.jsp
  - Servers
  - Quick Access
  - DOCTYPE.htm
  - html
  - jspdirective.p
  - index.html
  - AdminHome.jsp
  - Index.html
  - DataUserAD.jsp
  - DataOwners.jsp
  - AdminHome.jsp
  - 1. @@ page language="java" contentType="text/html; charset=ISO-8859-1"
  - 2. <%@ page pageEncoding="ISO-8859-1"%>
  - 3. <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4/loose.dtd">
  - 4. <html>
  - 5.   <head>
  - 6.     <meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
  - 7.     <title>Admin | Home</title>
  - 8.     <meta charset="UTF-8">
  - 9.     <meta name="viewport" content="width=device-width, initial-scale=1.0">
  - 10.    <link rel="stylesheet" href="https://unpkg.com/swiper/swiper-bundle.min.css" />
  - 11.    <!-- Font awesome cdn link -->
  - 12.    <link rel="stylesheet" href="https://cdnjs.cloudflare.com/ajax/libs/font-awesome/5.15.3/css/all.min.css" />
  - 13.    <!-- custom css file link -->
  - 14.    <link rel="stylesheet" href="css/style.css" />
  - 15.  </head>
  - 16.  <body>
  - 17.    <div id="menu-bar" class="fas fa-bars"></div>
  - 18.    <nav class="navban">
  - 19.      <a href="AdminHome.jsp"><i class="fas fa-cloud"></i> Admin Module</a>
  - 20.      <a href="UserUpdates.jsp"><i class="fas fa-user"></i> User Updates</a>
  - 21.      <a href="DataOwnerAD.jsp"><i class="fas fa-database"></i> Data Owners</a>
  - 22.      <a href="DataUsersAD.jsp"><i class="fas fa-users"></i> Data Users</a>
  - 23.      <a href="Index.html">Log out</a>
  - 24.    </nav>
  - 25.    <h1>Welcome to Admin Home Page!!!</h1>
  - 26.    <div class="content">
  - 27.      <div class="row">
  - 28.        <div class="col-4">
  - 29.          <div class="card" style="background-color: #f0f0f0; border-radius: 10px; padding: 10px; text-align: center; border: 1px solid #ccc; margin-bottom: 10px;">
  - 30.            <img alt="User icon" style="width: 50px; height: 50px; border-radius: 50%; border: 2px solid #ccc; margin-bottom: 5px;">
  - 31.            <a href="UserUpdates.jsp">Home</a>
  - 32.            <a href="UserUpdates.jsp">Monitor Data's</a>
  - 33.            <a href="UserUpdates.jsp">User Modified</a>
  - 34.            <a href="DataOwnerAD.jsp">Data Owners</a>
  - 35.            <a href="DataUsersAD.jsp">Data Users</a>
  - 36.            <a href="Index.html">Log out</a>
  - 37.          </div>
  - 38.        </div>
  - 39.        <div class="col-4" style="text-align: center; margin-top: 20px;">
  - 40.          <img alt="Database icon" style="width: 100px; height: 100px; border-radius: 50%; border: 2px solid #ccc; margin-bottom: 10px;">
  - 41.          <a href="DataOwnerAD.jsp">Data Owners</a>
  - 42.          <a href="DataUsersAD.jsp">Data Users</a>
  - 43.          <a href="Index.html">Log out</a>
  - 44.        </div>
  - 45.        <div class="col-4" style="text-align: center; margin-top: 20px;">
  - 46.          <img alt="Cloud icon" style="width: 100px; height: 100px; border-radius: 50%; border: 2px solid #ccc; margin-bottom: 10px;">
  - 47.          <a href="AdminHome.jsp">Admin Module</a>
  - 48.          <a href="UserUpdates.jsp">User Updates</a>
  - 49.          <a href="Index.html">Log out</a>
  - 50.        </div>
  - 51.      </div>
  - 52.      <div class="row" style="margin-top: 20px;">
  - 53.        <div class="col-4" style="text-align: center; margin-right: 10px;">
  - 54.          <img alt="File icon" style="width: 50px; height: 50px; border-radius: 50%; border: 2px solid #ccc; margin-bottom: 10px;">
  - 55.          <a href="UserDownloadFiles.jsp">Download Files</a>
  - 56.        </div>
  - 57.        <div class="col-4" style="text-align: center; margin-right: 10px;">
  - 58.          <img alt="User icon" style="width: 50px; height: 50px; border-radius: 50%; border: 2px solid #ccc; margin-bottom: 10px;">
  - 59.          <a href="UserFileRequest.jsp">File Requests</a>
  - 60.        </div>
  - 61.        <div class="col-4" style="text-align: center;">
  - 62.          <img alt="Database icon" style="width: 50px; height: 50px; border-radius: 50%; border: 2px solid #ccc; margin-bottom: 10px;">
  - 63.          <a href="DataOwnerAD.jsp">Data Owners</a>
  - 64.          <a href="DataUsersAD.jsp">Data Users</a>
  - 65.          <a href="Index.html">Log out</a>
  - 66.        </div>
  - 67.      </div>
  - 68.    </div>
  - 69.  </body>
  - 70. </html>
  
```



AES Algorithm

Review_2 - Java EE - Dynamic_Data_Auditing/src/com/crypto/AES.java - Eclipse

```

1 package com.crypto;
2 import java.security.Key;
3
4 public class AES {
5     private static String algorithm = "AES";
6     private static byte[] keyValue = new byte[]{
7         (byte)'A', (byte)'S', (byte)'e', (byte)'c', (byte)'r', (byte)'e', (byte)'S', (byte)'e', (byte)'c', (byte)'r', (byte)'e', (byte)'t', (byte)'K', (byte)'e', (byte)'y'};
8
9     public static String encrypt99(String plainText) throws Exception {
10        Key key = generateKey();
11        Cipher cipher = Cipher.getInstance(algorithm);
12        cipher.init(Cipher.ENCRYPT_MODE, key);
13        byte[] encVal = cipher.doFinal(plainText.getBytes());
14        String encryptedValue = new BASE64Encoder().encode(encVal);
15        return encryptedValue;
16    }
17
18    public static String decrypt(String encryptedText) throws Exception {
19        Key key = generateKey();
20        Cipher cipher = Cipher.getInstance(algorithm);
21        cipher.init(Cipher.DECRYPT_MODE, key);
22        byte[] decVal = cipher.doFinal(encryptedText.getBytes());
23        String decryptedValue = new BASE64Decoder().decodeBuffer(decVal);
24        String decryptedValue = new String(decryptedValue);
25        return decryptedValue;
26    }
27
28    public static Key generateKey() throws Exception {
29        Key key = new SecretKeySpec(keyValue, algorithm);
30        return key;
31    }
32
33}

```

Markers Properties Servers Data Source Explorer Snippets Console

Tomcat v9.0 Server at localhost [Started, Synchronized]

Review_2 - Java EE - Dynamic_Data_Auditing/src/com/crypto/Encrypt.java - Eclipse

```

1 package com.crypto;
2
3 public class Encrypt {
4     public static String encrypt(String data) throws Exception {
5         System.out.println("Encrypted data on the way ");
6         Key key = Publickey.generateKey();
7         Cipher c = Cipher.getInstance("AES");
8         c.init(Cipher.ENCRYPT_MODE, key);
9         byte[] encVal = c.doFinal(data.getBytes());
10        String encryptedValue = new BASE64Encoder().encode(encVal);
11        return encryptedValue;
12    }
13
14    public static String decrypt(String encryptedData) throws Exception {
15        Key key = Publickey.generateKey();
16        Cipher c = Cipher.getInstance("AES");
17        c.init(Cipher.DECRYPT_MODE, key);
18        byte[] decVal = c.doFinal(encryptedData.getBytes());
19        String decryptedValue = new BASE64Decoder().decodeBuffer(decVal);
20        String decryptedValue = new String(decryptedValue);
21        System.out.println("Key is :::"+ABEKey.generateKey());
22        return decryptedValue;
23    }
24
25}

```

Markers Properties Servers Data Source Explorer Snippets Console

Tomcat v9.0 Server at localhost [Started, Synchronized]

Review_2 - Java EE - Dynamic_Data_Auditing/src/com/crypto/Publickey.java - Eclipse

```

1 package com.crypto;
2
3 public class Publickey {
4     private static final String ALGO = "AES";
5     private static final byte[] keyValue = new byte[]{
6         (byte)'T', (byte)'h', (byte)'e', (byte)'B', (byte)'e', (byte)'s', (byte)'t', (byte)'S', (byte)'e', (byte)'c', (byte)'r', (byte)'e', (byte)'t', (byte)'K', (byte)'e', (byte)'y'};
7
8     public static Key generateKey() throws Exception {
9         Key key = new SecretKeySpec(keyValue, ALGO);
10        return key;
11    }
12
13}

```

Markers Properties Servers Data Source Explorer Snippets Console

Tomcat v9.0 Server at localhost [Started, Synchronized]

CONCLUSION:

- In conclusion, the implementation of a privacy-preserving data security model in the cloud using the AES algorithm is a crucial step towards ensuring the confidentiality and integrity of sensitive information.
- By employing AES encryption, data is protected from unauthorized access or tampering, bolstering trust in cloud-based services. The utilization of cloud infrastructure offers scalability and flexibility, catering to the evolving needs of modern businesses while maintaining stringent security standards.
- However, challenges such as key management complexities and potential vulnerabilities in the cloud infrastructure must be addressed through robust security protocols and continuous monitoring. Integration of access control mechanisms further enhances data privacy, allowing organizations to enforce fine-grained access policies based on user roles or attributes.
- Moving forward, ongoing research and development efforts are essential to stay ahead of emerging threats and enhance the resilience of privacy-preserving data security models. With a comprehensive approach encompassing encryption, access control, and regular audits, organizations can confidently leverage cloud technologies while safeguarding the privacy and security of their data assets.

FUTURE WORK:

In the future, we plan to research on applying the principles of AES algorithm using secure data sharing for improvising encryption performance