

Practical Multi-keyword Ranked Search with Access Control over Encrypted Cloud Data

Submitted in partial fulfilment of the requirements for the award of
Bachelor of Engineering Degree in Computer Science and Engineering

By

Nikitha M(37110510)



DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SCHOOL OF COMPUTING

**SATHYABAMA INSTITUTE OF SCIENCE AND
TECHNOLOGY**

(DEEMED TO BE UNIVERSITY)

**Accredited with Grade "A" by NAACJEPPIAAR
NAGAR, RAJIV GANDHI SALAI, CHENNAI - 600119**

JUNE 2020



SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

Accredited with Grade “A” by NAAC

Jeppiaar Nagar, Rajiv Gandhi Salai, Chennai-600119

www.sathyabama.ac.in

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

BONAFIDECERTIFICATE

This is to certify that this Project Report is the bonafide work of **Nikitha M (37110510)** who carried out the project entitled “**Practical Multi-keyword Ranked Search with Access Control over Encrypted Cloud Data**” under our supervision from April 2020 to March 2021.

Internal Guide

Ms.Suja C.M (Ph.D.),

Head of the Department

Dr. S. Vigneshwari M.E.,Ph.D.,

Submitted for Viva voce Examination held on _____

Internal Examiner

External Examiner

DECLARATION

INIKITHA M (Reg.No.37110510) hereby declare that the Project Reportentitled“**Practical Multi-keyword Ranked Search with Access Control over Encrypted Cloud Data**”donebymeundertheguidanceof **Ms. Suja C.M(Ph.D.)**,is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degreein Computer Science and Engineering.

DATE: 13/01/2021

PLACE: Chennai

SIGNATURE OF THECANDIDATE

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to **Board of Management of SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

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I would like to express my sincere and deep sense of gratitude to my Project Guide **Ms. Suja C.M (Ph.D.), Associative professor, Department of Computer Science and Engineering** for her valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the Department of **COMPUTER SCIENCE AND ENGINEERING** who were helpful in many ways for the completion of the project.

Practical Multi-keyword Ranked Search with Access Control over Encrypted Cloud Data

Abstract

The Explosive growth of data volume in the cloud computing environment, data owners are increasingly inclined to store their data on the cloud. Although data outsourcing reduces computation and storage costs for them, it inevitably brings new security and privacy concerns, as the data owners lose direct control of sensitive data. MRSF can realize highly accurate ciphertext retrieval by combining coordinate matching with Term Frequency-Inverse Document Frequency (TF-IDF) and improving the secure kNN method. Besides, it can effectively refine users' search privileges by utilizing the polynomial-based access strategy.

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1.INTRODUCTION

1.1 Overview

Cloud Computing offers ubiquitous and on-demand access to flexible computation and storage resources. Therefore, outsourcing local data to cloud servers has become a common practice for enterprises and individuals. While this measure greatly reduces hardware and maintenance expenditure, data owners actually lose direct control over their data. This certainly has brought some security concerns, especially to owners of highly sensitive data.

1.2 Objective

MRSF implements its access control mechanism by checking the validity of the user's roles. Here we define the role as the root of the corresponding polynomial. Data owners create their access policies by constructing a polynomial under certain requirements then perform control on cloud data after distributing the roots of the polynomial as the roles for specified data users. This access control mechanism is lightweight because the whole mechanism is realized only by extending indexes and query vectors. We also design extensive experiments to demonstrate that the time cost of access control is negligible.

1.3 Scope

The cloud server, which has exceptional computation power and huge storage capacities, provides data hosting and processing services for data owners and data users. Upon receiving the token from an authorized data user, the cloud server first conducts search operations based on encrypted indexes and token, then returns the relevant encrypted documents. The data user acquires the secret keys and the access roles from the data owner through a secure channel after issuing a search request. Next, the data user generates his/her search token with the secret key, then sends it to the cloud server. The secret key is also used for decrypting the retrieved results off-line. Moreover, the polynomial based access control mechanism is employed to manage the decryption capabilities of data users.

2.LITERATURE SURVEY

- S. Andrews, I. Tsochantaridis, and T. Hofmann. Support vector machines for multiple-instance learning. In Advances in Neural Information Processing Systems (NIPS), volume 15, pages 561–568. MIT Press, 2003.
- D. Angluin. Queries revisited. In Proceedings of the International Conference on Algorithmic Learning Theory, pages 12–31. Springer-Verlag, 2001.
- M.F. Balcan, A. Beygelzimer, and J. Langford. Agnostic active learning. In Proceedings of the International Conference on Machine Learning (ICML), pages 65–72. ACM Press, 2006.

● 3.SYSTEM ANALYSIS

● 3.1 Existing system

- o In Existing System, Most of the organization are outsourcing their data's for storage. By which, Most of their confidential data's are in a possibility of theft.

● 3.1.1 Disadvantage

- o Other half of the Organizations uses cloud storage technique to store their data's. By which, The is no control over search privileges. Any department information can be retrieved by the other department of the Organization. So, It lacks security.

● 3.2 Proposed System

- o In Proposed System, Organization can Multi-keyword Ranked Search scheme with Fine-grained access control (MRSF) their data's for storage. By which, Most of their confidential data's access will be secured by setting the search privileges for the users.

● 3.2.2 Advantage

- o MRSF provides highly accurate cipher text retrieval. By which, Time consumption is minimized.

4.SYSTEM REQUIREMENTS

4.1 Software requirements

- Front End : Java(Jdk,Eclipe Luna/Neon)
- Back End : Sql(5.0)

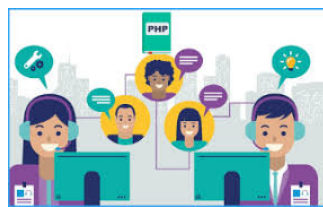
4.2 Hardware

- I3 Processor
- 4 gb Ram
- Windows 10 Operating System
- Internet Connection

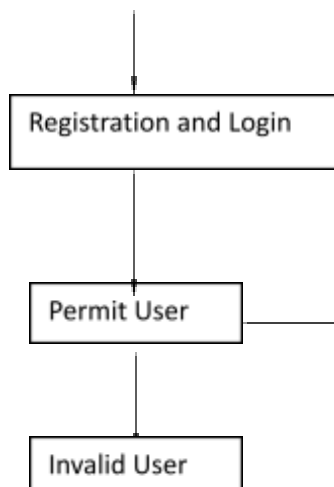
5.SYSTEM DESIGN

5.1 Block diagram

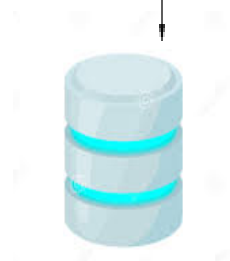
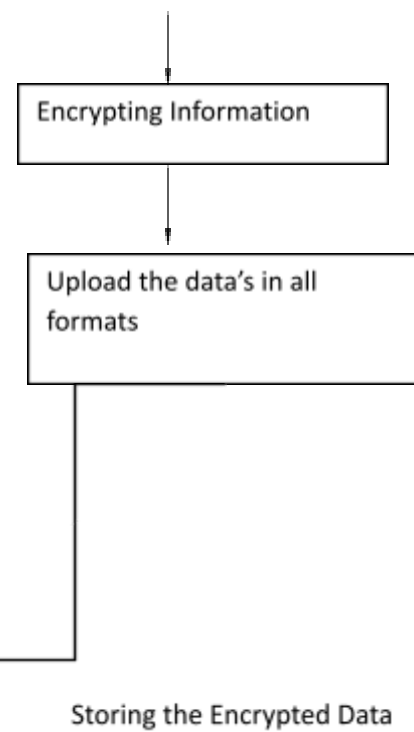
Architecture



Data Users

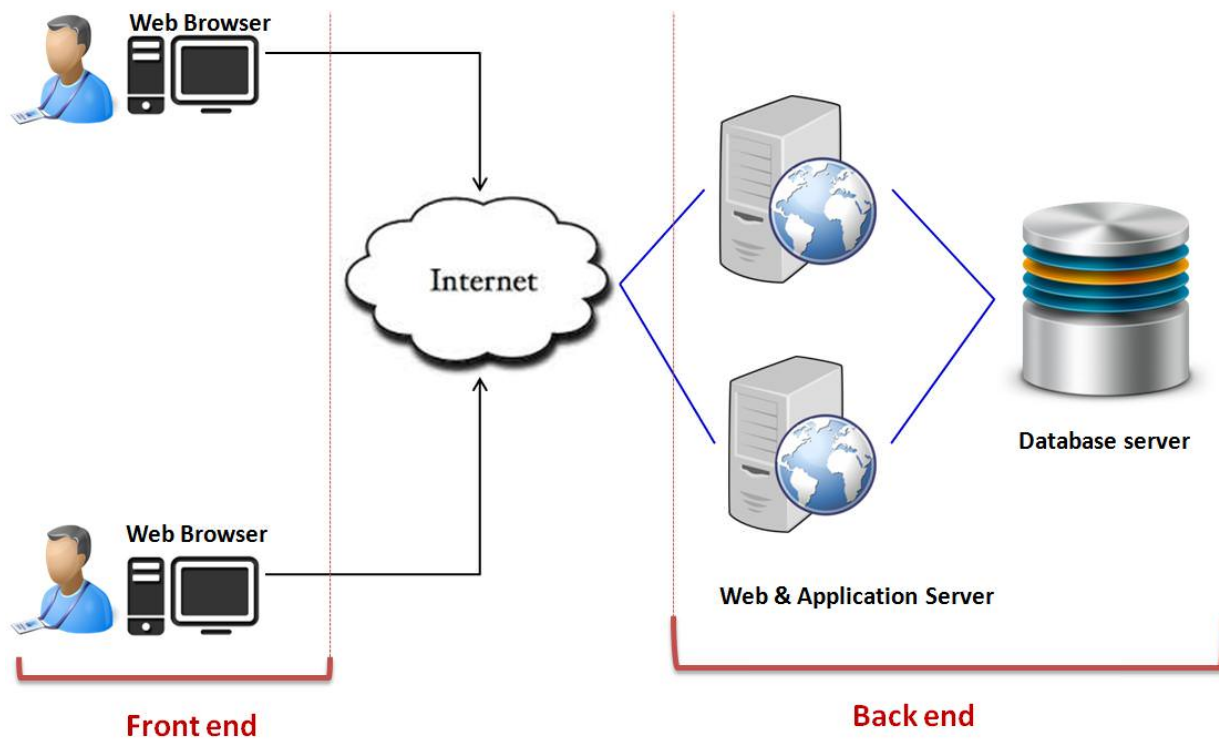


Data Owners

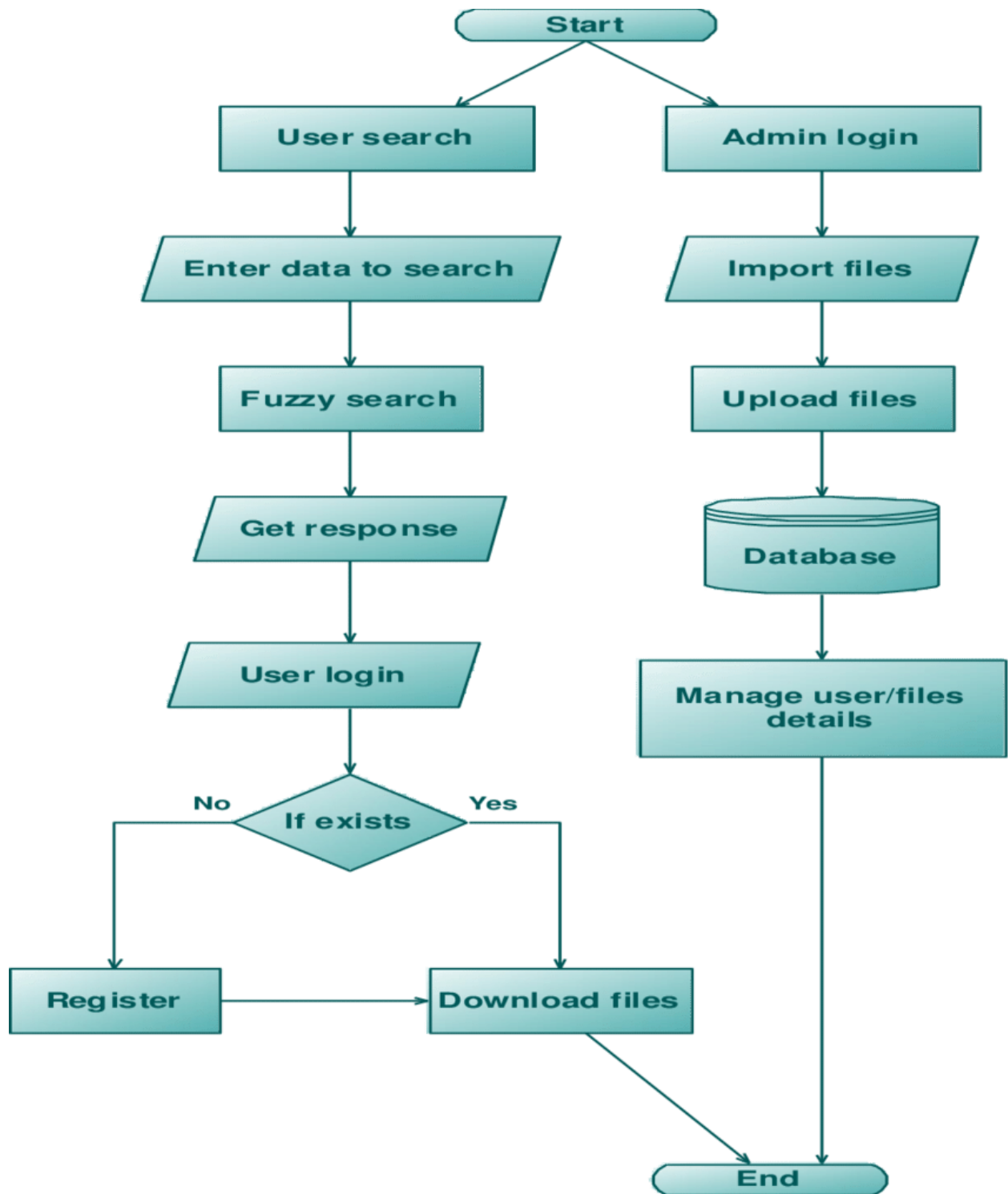


Public Cloud

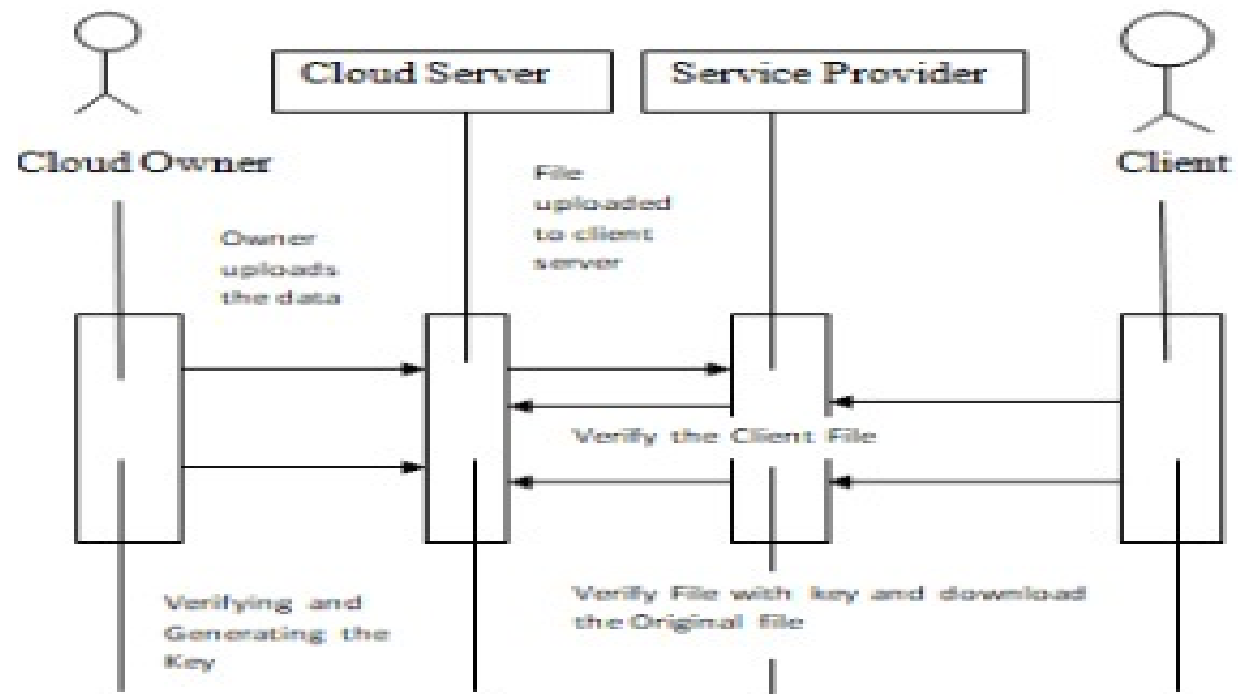
5.1.1 WorkFlow :



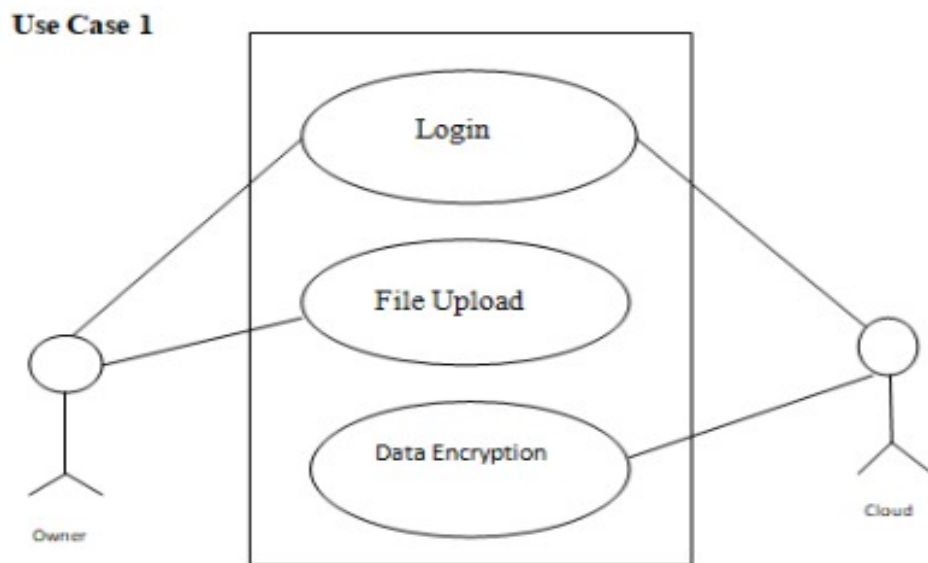
5.2 Data flow diagram



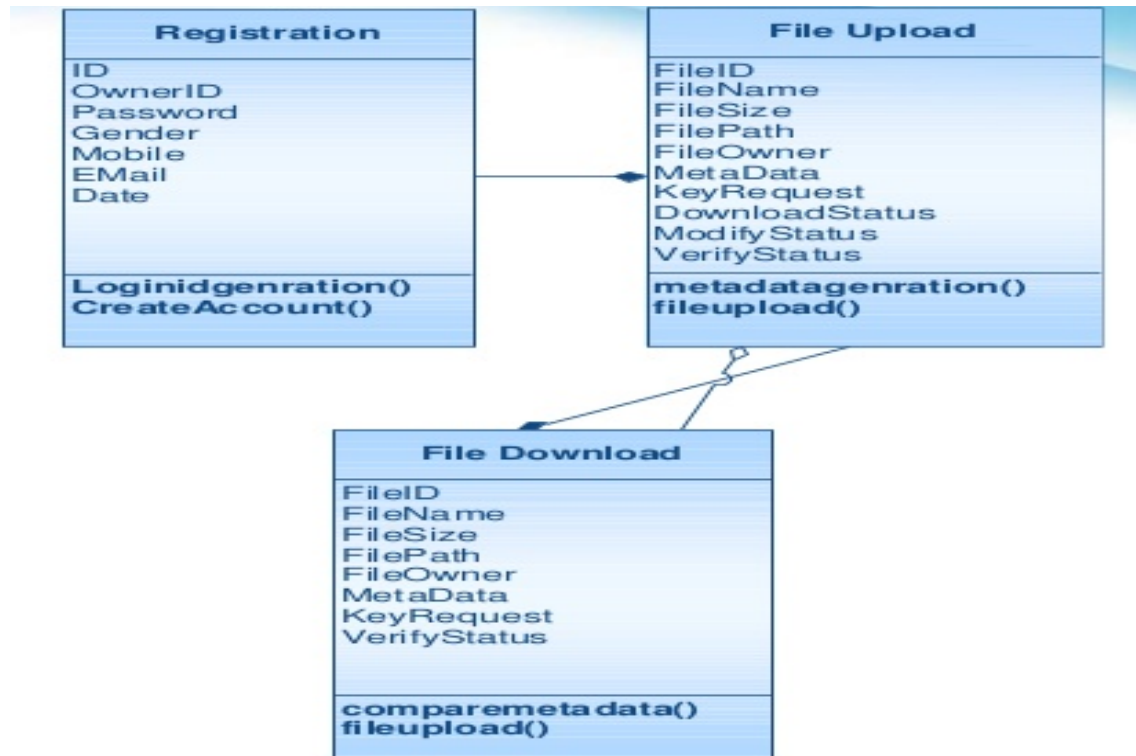
5.3 Sequence diagram



5.4 Use Case diagram



5.5 Class diagram



6.PROJECT DESCRIPTION

1. Data Owner and Data User Login, Registration.

Login, Registration of the privileged users and Data owners are managed. The required access control over the data are also given.

2. Data Owner uploads the file to the cloud server by mapping it with respective keyword.

Project Managers and Business Leads are supposed to update their daily productivity to the Organization's cloud server. This data are mapped using an identifier keyword and stored inside the cloud.

3. File uploaded are encrypted along with its keyword and stored inside the cloud server.

The file which is uploaded are stored inside the cloud server are encrypted and also mapping the files using keywords which is also Encrypted. This Encryption is done via AES algorithm.

4. Data User need to search the keyword of the file directly from the cloud server and fetch the required data.

Data User needs to get the Information from the cloud server by directly reading the keyword in cipher text form and the fetching the particular acquired data from the cloud.

7.IMPLEMENTATION

Home page - Index.jsp

```
<!-- Author: W3layouts
Author URL: http://w3layouts.com
License: Creative Commons Attribution 3.0 Unported
License URL: http://creativecommons.org/licenses/by/3.0/
-->
<!DOCTYPE HTML>
<html lang="zxx">

<head>
<title>Efficient Regular Language Search</title>
<meta name="viewport" content="width=device-width, initial-scale=1">
<meta charset="utf-8">
<meta name="keywords" content="Skill Point Responsive web template, Bootstrap Web
Templates, Flat Web Templates, Android Compatible web template,
SmartPhone Compatible web template, free WebDesigns for Nokia, Samsung, LG,
SonyEricsson, Motorola web design" />
<script>
    addEventListener("load", function () {
        setTimeout(hideURLbar, 0);
    }, false);

function hideURLbar() {
    window.scrollTo(0, 1);
```

```

    }
</script>

<!-- Bootstrap Core CSS -->
<link href="css/bootstrap.css" rel='stylesheet' type='text/css' />
<!-- Custom CSS -->
<!-- animation -->
<link href="css/animate.css" rel="stylesheet" type="text/css" media="all">
<link href="css/style.css" rel='stylesheet' type='text/css' />
<link href="css/screenshot_view.css" rel='stylesheet' type='text/css' />
<!-- font-awesome icons -->
<link href="css/fontawesome-all.min.css" rel="stylesheet">
<!-- //Custom Theme files -->
<!-- online fonts -->
<link
href="//fonts.googleapis.com/css?family=Poppins:100,100i,200,200i,300,300i,400,400i,5
00,500i,600,600i,700,700i,800,800i,900,900i"
rel="stylesheet">
<link href="//fonts.googleapis.com/css?family=Gentium+Book+Basic:400,400i,700i"
rel="stylesheet">

<!--//online fonts -->
</head>

<body>
<div class="se-pre-con"></div>
<!-- header -->
<header>
<div class="header-top">
<div class="container">
<div class="row">
<div class="col-md-6">
<!--
<ul class="d-flex header-agile"> -->
<!--
<li> -->
<!--
<span class="fasfa-envelope-open"></span> -->
<!--
<a href="mailto:example@email.com"
class="text-white"></a> -->
<!--
</li> -->
<!--
<li> -->
<!--
<span class="fasfa-phone-volume"></span> -->
<!--
<p class="d-inline text-white"></p> -->
<!--
</li> -->
<!--
</ul> -->
</div>
<div class="col-md-6 header-right-agile">
<div class="d-flex">
<!-- Multiple select filter -->
<!--
<select class="custom-select"> -->
<!--
<option value="HTML">Programming</option> -->
<!--
<option value="jQuery">Art & Design</option> -->
<!--
<option value="Pug">Languages</option> -->
<!--
<option value="SASS">UX Training</option> -->
<!--
<option value="Angular">Business</option> -->
<!--
<option value="React">Vocabulary</option> -->

```

```

<!-- <option value="Jade">Photography</option> -->
<!-- <option value="PHP">Inclusive-education</option>
-->
<!-- <option value="Java">New Technologies</option>
-->
<!-- </select> -->
<!-- Multiple select filter -->
<div class="login-wthree my-auto">
<!-- <a href="login.html" class="text-white
text-capitalize">login <span class="fasfa-sign-in-alt flash animated
infinite"></span></a> -->
</div>
</div>
</div>
</div>
</div>
</div>
<div class="header-bottom">
<div class="container">
<nav class="navbar navbar-expand-lg navbar-light p-0">
<h1><a class="navbar-brand" href="index.html">
<span>E</span>fficient Search
<i class="w3-spacing"></i>
<!-- <span>S</span>earch -->
</a></h1>
<button class="navbar-toggler ml-lg-auto ml-sm-5" type="button"
data-toggle="collapse" data-target="#navbarSupportedContent"
aria-controls="navbarSupportedContent" aria-expanded="false"
aria-label="Toggle navigation">
<span class="navbar-toggler-icon"></span>
</button>
<div class="collapse navbar-collapse" id="navbarSupportedContent">
<ul class="navbar-nav text-center ml-auto">
<li class="nav-item active mr-lg-3 mt-lg-0 mt-4">
<a class="hover-fill" href="home.html" data-txthover="Home">Home</a>
</li>
<li class="nav-item mr-lg-3 mt-lg-0 mt-4">
<a class="hover-fill" href="DataOwnerRegistration.jsp"
data-txthover="About">DataOwnerRegistration</a>
</li>
<li class="nav-item mr-lg-3 mt-lg-0 mt-4">
<a class="hover-fill" href="DataUserRegistration.jsp"
data-txthover="Portfolio">DataUserRegistration</a>
</li>
<li class="nav-item mr-lg-3 mt-lg-0 mt-4">
<a class="hover-fill" href="DataOwnerLogin.jsp"
data-txthover="About">DataOwnerLogin</a>
</li>
<li class="nav-item mr-lg-3 mt-lg-0 mt-4">
<a class="hover-fill" href="DataUserLogin.jsp"
data-txthover="Portfolio">DataUserLogin</a>
</li>
<!-- <li class="nav-item"> -->

```

```
<!-- <a class="hover-fill" href="contact.html"
data-txthover="Contact">Contact</a> -->
<!-- </li> -->
</ul>
</div>
</nav>
</div>
</div>
</header>
<!-- //header -->
<!-- banner -->

<!-- //banner -->
<!-- pages grid-->

<!-- //pages grid-->
<!-- footer top -->

<style>
.center
{
display:block;
margin-left:auto;
margin-right:auto;
width:50%;
}
</style>


<!-- //footer top -->
<!-- footer -->
<footer>
<div class="container">
<div class="row">
<div class="col-lg-6">
<div class="social-icons d-flex my-auto justify-content-lg-start
justify-content-center">
<!-- <h2 class="mr-4">stay connected :</h2> -->
<!-- <ul class="social-iconsv2 agileinfo"> -->
<!-- <li> -->
<!-- <a href="#"> -->
<!-- <i class="fabfa-facebook-f"></i> -->
<!-- </a> -->
<!-- </li> -->
<!-- <li> -->
<!-- <a href="#"> -->
<!-- <i class="fabfa-twitter"></i> -->
<!-- </a> -->
<!-- </li> -->
<!-- <li> -->
<!-- <a href="#"> -->
<!-- <i class="fabfa-google-plus-g"></i> -->
<!-- </a> -->
```

```
<!-->  
    </li> -->  
<!-->  
        <a href="#"> -->  
            <i class="fabfa-linkedin-in""></i> -->  
<!-->  
                </a> -->  
<!-->  
            </li> -->  
<!-->  
        </ul> -->  
</div>  
</div>  
<div class="col-lg-6 my-lg-auto mt-3">  
<div class="cpy-right text-lg-right text-center">  
<p class="text-secondary">Â© 2020 All rights reserved  
<a href="http://w3layouts.com"> IT Project Team</a>  
</p>  
</div>  
</div>  
</div>  
</div>  
</div>  
</footer>  
<!-- //footer -->  
<!-- js-->  
<script src="js/jquery-2.2.3.min.js"></script>  
<!-- loading-gifJs -->  
<script src="js/modernizr.js"></script>  
<script>  
    //paste this code under head tag or in a separte js file.  
    // Wait for window load  
    $(window).load(function () {  
        // Animate loader off screen  
        $(".se-pre-con").fadeOut("slow");  
    });  
</script>  
<!--// loading-gifJs -->  
<!-- Multiple select filter using jQuery -->  
<script src="js/custom-select.js"></script>  
<!-- //Multiple select filter using jQuery -->  
<!-- start-smooth-scrolling -->  
<script src="js/move-top.js">  
</script>  
<script src="js/easing.js"></script>  
<script>  
    jQuery(document).ready(function ($) {  
        $(".scroll").click(function (event) {  
            event.preventDefault();  
  
            $('html,body').animate({  
                scrollTop: $(this.hash).offset().top  
            }, 1000);  
        });  
    });  
</script>  
<!-- //end-smooth-scrolling -->  
<!-- smooth-scrolling-of-move-up -->  
<script>
```

```

        $(document).ready(function () {
            /*
                var defaults = {
                containerID: 'toTop', // fading element id
                containerHoverID: 'toTopHover', // fading element hover id
                scrollSpeed: 1200,
                easingType: 'linear'
                };
            */

            $().UItoTop({
                easingType: 'easeOutQuart'
            });

        });
    </script>
    <script src="js/SmoothScroll.min.js"></script>
    <!-- //smooth-scrolling-of-move-up -->
    <!-- Bootstrap Core JavaScript -->
    <script src="js/bootstrap.js">
    </script>
    <!-- //Bootstrap Core JavaScript -->
</body>

</html>

```

DataOwnerRegistration.jsp

```

<!-- Author: W3layouts
Author URL: http://w3layouts.com
License: Creative Commons Attribution 3.0 Unported
License URL: http://creativecommons.org/licenses/by/3.0/
-->
<!DOCTYPE HTML>
<html lang="zxx">

<head>
<title>Efficient Regular Language Search</title>
<meta name="viewport" content="width=device-width, initial-scale=1">
<meta charset="utf-8">
<meta name="keywords" content="Skill Point Responsive web template, Bootstrap Web
Templates, Flat Web Templates, Android Compatible web template,
SmartPhone Compatible web template, free WebDesigns for Nokia, Samsung, LG,
SonyEricsson, Motorola web design" />
<script>
    addEventListener("load", function () {
        setTimeout(hideURLbar, 0);
    }, false);

    function hideURLbar() {
        window.scrollTo(0, 1);
    }
</script>

```

```

<!-- Bootstrap Core CSS -->
<link href="css/bootstrap.css" rel='stylesheet' type='text/css' />
<!-- Custom CSS -->
<!-- animation -->
<link href="css/animate.css" rel="stylesheet" type="text/css" media="all">
<link href="css/style.css" rel='stylesheet' type='text/css' />
<link href="css/screenshot_view.css" rel='stylesheet' type='text/css' />
<!-- font-awesome icons -->
<link href="css/fontawesome-all.min.css" rel="stylesheet">
<!-- //Custom Theme files -->
<!-- online fonts -->
<link
href="//fonts.googleapis.com/css?family=Poppins:100,100i,200,200i,300,300i,400,400i,5
00,500i,600,600i,700,700i,800,800i,900,900i"
rel="stylesheet">
<link href="//fonts.googleapis.com/css?family=Gentium+Book+Basic:400,400i,700i"
rel="stylesheet">

<!--//online fonts -->

</head>

<body>

<div class="se-pre-con"></div>
<!-- header -->
<header>
<div class="header-top">
<div class="container">
<div class="row">
<div class="col-md-6">
<!--
<ul class="d-flex header-agile"> -->
<!--
<li> -->
<!--
<span class="fasfa-envelope-open"></span> -->
<!--
<a href="mailto:example@email.com"
class="text-white"></a> -->
<!--
</li> -->
<!--
<li> -->
<!--
<span class="fasfa-phone-volume"></span> -->
<!--
<p class="d-inline text-white"></p> -->
<!--
</li> -->
<!--
</ul> -->
</div>
<div class="col-md-6 header-right-agile">
<div class="d-flex">
<!-- Multiple select filter -->
<!--
<select class="custom-select"> -->
<!--
<option value="HTML">Programming</option> -->
<!--
<option value="jQuery">Art & Design</option> -->
<!--
<option value="Pug">Languages</option> -->
<!--
<option value="SASS">UX Training</option> -->

```

```

<!-- <option value="Angular">Business</option> -->
<!-- <option value="React">Vocabulary</option> -->
<!-- <option value="Jade">Photography</option> -->
<!-- <option value="PHP">Inclusive-education</option>
-->
<!-- <option value="Java">New Technologies</option>
-->
<!-- </select> -->
<!-- Multiple select filter -->
<div class="login-wthree my-auto">
<!-- <a href="login.html" class="text-white
text-capitalize">login <span class="fasfa-sign-in-alt flash animated
infinite"></span></a> -->
</div>
</div>
</div>
</div>
</div>
<div class="header-bottom">
<div class="container">
<nav class="navbar navbar-expand-lg navbar-light p-0">
<h1><a class="navbar-brand" href="index.html">
<span>E</span>fficient Search
<i class="w3-spacing"></i>
<!-- <span>S</span>earch -->
</a></h1>
<button class="navbar-toggler ml-lg-auto ml-sm-5" type="button"
data-toggle="collapse" data-target="#navbarSupportedContent"
aria-controls="navbarSupportedContent" aria-expanded="false"
aria-label="Toggle navigation">
<span class="navbar-toggler-icon"></span>
</button>
<div class="collapse navbar-collapse" id="navbarSupportedContent">
<ul class="navbar-nav text-center ml-auto">
<li class="nav-item active mr-lg-3 mt-lg-0 mt-4">
<a class="hover-fill" href="index.html" data-txthover="Home">Home</a>
</li>
<!-- <li class="nav-item mr-lg-3 mt-lg-0 mt-4"> -->
<!-- <a class="hover-fill" href="about.html"
data-txthover="About">DataOwnerRegistration</a> -->
<!-- </li> -->
<!-- <li class="nav-item mr-lg-3 mt-lg-0 mt-4"> -->
<!-- <a class="hover-fill" href="portfolio.html"
data-txthover="Portfolio">DataUserRegistration</a> -->
<!-- </li> -->
<!-- <li class="nav-item mr-lg-3 mt-lg-0 mt-4"> -->
<!-- <a class="hover-fill" href="about.html"
data-txthover="About">DataOwnerLogin</a> -->
<!-- </li> -->
<!-- <li class="nav-item mr-lg-3 mt-lg-0 mt-4"> -->
<!-- <a class="hover-fill" href="portfolio.html"
data-txthover="Portfolio">DataUserLogin</a> -->
<!-- </li> -->

```

```

<!-- <li class="nav-item"> -->
<!-- <a class="hover-fill" href="contact.html"
data-txthover="Contact">Contact</a> -->
<!-- </li> -->
</ul>
</div>
</nav>
</div>
</div>
</header>
<!-- //header -->
<!-- banner -->
<!-- <div class=""> -->
<!-- <div class="col-lg-8 screen-view-img order-md-0 order-1"> -->
<!--  -->
<!-- </div> -->
<!-- <div class=""> -->
<!-- <h3>skill point - the education template</h3> -->
<!-- <ul class="list-group mt-lg-3 pb-lg-0 pb-3"> -->
<!-- <li class="list-group-item border-0"> -->
<!-- <i class="fasfa-check mr-3"></i>Fully Responsive </li> -->
<!-- <li class="list-group-item border-0"> -->
<!-- <i class="fasfa-check mr-3"></i> Built with valid HTML5 and
CSS3 code</li> -->
<!-- <li class="list-group-item border-0"> -->
<!-- <i class="fasfa-check mr-3"></i>Bootstrap4 Framework</li>
-->
<!-- <li class="list-group-item border-0"> -->
<!-- <i class="fasfa-check mr-3"></i>12 HTML Pages</li> -->
<!-- <li class="list-group-item border-0"> -->
<!-- <i class="fasfa-check mr-3"></i>11 Accordion Styles</li> -->
<!-- <li class="list-group-item border-0"> -->
<!-- <i class="fasfa-check mr-3"></i>Easy to Use/Customize</li>
-->
<!-- <li class="list-group-item border-0"> -->
<!-- <i class="fasfa-check mr-3"></i>Clean and Commented
Code</li> -->
<!-- <li class="list-group-item border-0"> -->
<!-- <i class="fasfa-check mr-3"></i>Screenshot view</li> -->
<!-- <li class="list-group-item border-0"> -->
<!-- <i class="fasfa-check mr-3"></i> Cool Animated Loading
Icon</li> -->
<!-- <li class="list-group-item border-0"> -->
<!-- <i class="fasfa-check mr-3"></i>FilterablePortfolio</li> -->
<!-- </ul> -->
<!-- </div> -->
<!-- </div> -->
<!-- //banner -->
<!-- pages grid-->
<!-- <section class="py-lg-5 pages-sec"> -->
<!-- <div class="container py-md-5"> -->
<!-- <div class="py-5 text-center"> -->
<!-- <h3 class="text-white text-capitalize page-head">check out all
our pages</h3> -->

```

```

<!--          <p class="text-capitalize text-secondary mt-2">a nicely crafted
education theme, suitable for -->
<!--          educational institutions</p> -->
<!--          </div> -->
<!--          <div class="pages-row mt-lg-5"> -->
<!-- <!--          <div class="col-lg-4 col-md-6"> -->
<!-- <!--          <div class="page-grid-wthree"> -->
<!-- <!--          <div class="demo-page"> -->
<!-- <!--          <a href="home.html" target="_blank"> -->
<!-- <!--          </a> -->
<!-- <!--          </div> -->
<!-- <!--          <div class="demo-title text-center"> -->
<!-- <!--          <h4><a href="home.html"
target="_blank">home</a></h4> -->
<!-- <!--          </div> -->
<!-- <!--          </div> -->
<!-- <!--          </div> -->
<!--          <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->
<!--          <div class="demo-page"> -->
<!--          <a href="about.html" target="_blank"></a> -->
<!--          </div> -->
<!--          <div class="demo-title text-center"> -->
<!--          <h4><a href="about.html"
target="_blank">about</a></h4> -->
<!--          </div> -->
<!--          </div> -->
<!--          </div> -->
<!--          <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->
<!--          <div class="demo-page"> -->
<!--          <a href="services.html" target="_blank"></a> -->
<!--          </div> -->
<!--          <div class="demo-title text-center"> -->
<!--          <h4><a href="services.html"
target="_blank">services</a></h4> -->
<!--          </div> -->
<!--          </div> -->
<!--          </div> -->
<!--          <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->
<!--          <div class="demo-page"> -->
<!--          <a href="portfolio.html" target="_blank"></a> -->
<!--          </div> -->
<!--          <div class="demo-title text-center"> -->
<!--          <h4><a href="portfolio.html"
target="_blank">portfolio</a></h4> -->
<!--          </div> -->
<!--          </div> -->
<!--          </div> -->

```

```

<!--          <div class="col-lg-4 col-md-6"> -->
<!--              <div class="page-grid-wthree"> -->
<!--                  <div class="demo-page"> -->
<!--                      <a href="pricingplans.html" target="_blank"> -->
<!--                          </a> -->
<!--                              </div> -->
<!--                                  <div class="demo-title text-center"> -->
<!--                                      <h4><a href="pricingplans.html"
target="_blank">pricing plans</a></h4> -->
<!--                                          </div> -->
<!--                                              </div> -->
<!--                                                  </div> -->
<!--              <div class="col-lg-4 col-md-6"> -->
<!--                  <div class="page-grid-wthree"> -->
<!--                      <div class="demo-page"> -->
<!--                          <a href="courses.html"> -->
<!--                              </a> -->
<!--                                  </div> -->
<!--                                      <div class="demo-title text-center"> -->
<!--                                          <h4><a href="courses.html"
target="_blank">courses</a></h4> -->
<!--                                              </div> -->
<!--                                                  </div> -->
<!--              <div class="col-lg-4 col-md-6"> -->
<!--                  <div class="page-grid-wthree"> -->
<!--                      <div class="demo-page"> -->
<!--                          <a href="single.html" target="_blank"> -->
<!--                              </a> -->
<!--                                  </div> -->
<!--                                      <div class="demo-title text-center"> -->
<!--                                          <h4><a href="single.html" target="_blank">single
course</a></h4> -->
<!--                                              </div> -->
<!--                                                  </div> -->
<!--              <div class="col-lg-4 col-md-6"> -->
<!--                  <div class="page-grid-wthree"> -->
<!--                      <div class="demo-page"> -->
<!--                          <a href="team.html" target="_blank"> -->
<!--                              </a> -->
<!--                                  </div> -->
<!--                                      <div class="demo-title text-center"> -->
<!--                                          <h4><a href="about.html"
target="_blank">team</a></h4> -->
<!--                                              </div> -->
<!--                                                  </div> -->
<!--              <div class="col-lg-4 col-md-6"> -->
<!--                  <div class="page-grid-wthree"> -->

```

```

<!--          <div class="demo-page"> -->
<!--          <a href="testimonials.html" target="_blank"> -->
<!--          </a> -->
<!--          </div> -->
<!--          <div class="demo-title text-center"> -->
<!--          <h4><a href="testimonials.html"
target="_blank">testimonials</a></h4> -->
<!--          </div> -->
<!--          </div> -->
<!--          </div> -->
<!--          <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->
<!--          <div class="demo-page"> -->
<!--          <a href="typography.html" target="_blank"> -->
<!--          </a> -->
<!--          </div> -->
<!--          <div class="demo-title text-center"> -->
<!--          <h4><a href="typography.html"
target="_blank">typography</a></h4> -->
<!--          </div> -->
<!--          </div> -->
<!--          </div> -->
<!--          <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->
<!--          <div class="demo-page"> -->
<!--          <a href="contact.html" target="_blank"></a> -->
<!--          </div> -->
<!--          <div class="demo-title text-center"> -->
<!--          <h4><a href="contact.html"
target="_blank">contact</a></h4> -->
<!--          </div> -->
<!--          </div> -->
<!--          </div> -->
<!--          <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->
<!--          <div class="demo-page"> -->
<!--          <a href="login.html" target="_blank"></a> -->
<!--          </div> -->
<!--          <div class="demo-title text-center"> -->
<!--          <h4><a href="Registration.jsp"
target="_blank">Registration</a></h4> -->
<!--          </div> -->
<!--          <div class="demo-title text-center"> -->
<!--          <h4><a href="login.html"
target="_blank">login</a></h4> -->
<!--          </div> -->

<!--          </div> -->
<!--          </div> -->
<!--          </div> -->

```

```

<!--      </div> -->
<!--    </section> -->
<!-- //pages grid-->
<!-- footer top -->
<div class="footer-top py-5">
<div class="container">
<div class="row footer-cform pt-lg-5">
<div class="col-lg-6">
<!--      <h5 class="footer-top-title">site navigation</h5> -->
<div class="footer-top-agileits">
<!--      <ul class="list-agileits d-flex"> -->
<!--      <li> -->
<!--      <a href="index.html" class="nav-link py-0 pl-0">
-->
<!--      Home -->
<!--      </a> -->
<!--      </li> -->
<!--      <li> -->
<!--      <a href="about.html" class="nav-link py-0"> -->
<!--      About Us -->
<!--      </a> -->
<!--      </li> -->
<!--      <li> -->
<!--      <a href="services.html" class="nav-link py-0">
-->
<!--      Services -->
<!--      </a> -->
<!--      </li> -->
<!--      <li> -->
<!--      <a href="portfolio.html" class="nav-link py-0">
-->
<!--      portfolio -->
<!--      </a> -->
<!--      </li> -->
<!--      </ul> -->
<!--      <ul class="list-agileits d-flex"> -->
<!--      <li> -->
<!--      <a href="courses.html" class="nav-link py-0
pl-0"> -->
<!--      courses -->
<!--      </a> -->
<!--      </li> -->
<!--      <li> -->
<!--      <a href="index.html" class="nav-link py-0"> -->
<!--      privacy policy -->
<!--      </a> -->
<!--      </li> -->
<!--      <li> -->
<!--      <a href="contact.html" class="nav-link py-0">
-->
<!--      Contact Us -->
<!--      </a> -->
<!--      </li> -->
<!--      </ul> -->

```

```

</div>
<div class="footer-cont-btm">
<h5 class="footer-top-title">ADD DATA OWNER </h5>
<!-- <address class="my-4"> -->
<!-- <p>+4667 Woodland Terrace Folsom, California
916-983-6577.</p> -->
<!-- </address> -->
<!-- <ul class="d-flex header-agile pt-0"> -->
<!-- <li> -->
<!-- <span class="fasfa-envelope-open"></span> -->
<!-- <a href="mailto:example@email.com"
class="text-secondary">info@example.com</a> -->
<!-- </li> -->
<!-- <li> -->
<!-- <span class="fasfa-phone-volume"></span> -->
<!-- <p class="d-inline text-secondary">+456 123
7890</p> -->
<!-- </li> -->
<!-- </ul> -->
</div>
</div>
<div class="col-Lg-6 wthree-form-left my-Lg-0 mt-4">
<!-- <h5 class="footer-top-title">send us a message</h5> -->
<div class="footer-top-form">
<form action="AddOwner" method="post" class="footer-top-wthree">
<div class="form-group d-flex">
<label>
Name
</label>
<input class="form-control" type="text" placeholder="Johnson" name="name"
required="">
</div>
<div class="form-group d-flex">
<label>
Email
</label>
<input class="form-control" type="email" placeholder="example@email.com" name="email"
required="">
</div>
<div class="form-group d-flex">
<label>
Phone
</label>
<input class="form-control" type="text" placeholder="XXXX XXXX XX" name="phone"
required="">
</div>
<div class="form-group d-flex">
<label>
Password
</label>
<input class="form-control" type="password" placeholder="XXXXXX" name="pass"
required="">
</div>
<div class="form-group d-flex">

```

```

<label>
    Photo
</label>
<input type="file" id="photo" name="photo"
    size="50" required="">
</div>
<!-- <div class="form-group d-flex"> -->
<!-- <label> -->
<!-- Message -->
<!-- </label> -->
<!-- <textarea class="form-control" rows="5"
id="contactcomment" placeholder="Your message" -->
<!-- required></textarea> -->
<!-- </div> -->
<div class="d-flex justify-content-end">
<input type="submit" class="btn btn-agile btn-block w-25" value="submit">
</div>
</form>
</div>
</div>
</div>
</div>
</div>
</div>

</div>
</div>
</div>

<!-- //footer top -->
<!-- footer -->
<footer>
<div class="container">
<div class="row">
<div class="col-lg-6">
<div class="social-icons d-flex my-auto justify-content-lg-start
justify-content-center">
<!-- <h2 class="mr-4">stay connected :</h2> -->
<!-- <ul class="social-iconsv2 agileinfo"> -->
<!-- <li> -->
<!-- <a href="#"> -->
<!-- <i class="fabfa-facebook-f"></i> -->
<!-- </a> -->
<!-- </li> -->
<!-- <li> -->
<!-- <a href="#"> -->
<!-- <i class="fabfa-twitter"></i> -->
<!-- </a> -->
<!-- </li> -->
<!-- <li> -->
<!-- <a href="#"> -->
<!-- <i class="fabfa-google-plus-g"></i> -->

```

```
<!-->  
</li> -->  
<!-->  
<li> -->  
<!-->  
<a href="#"> -->  
<!-->  
<i class="fabfa-linkedin-in"></i> -->  
<!-->  
</a> -->  
<!-->  
</li> -->  
<!-->  
</ul> -->  
</div>  
</div>  
<div class="col-lg-6 my-lg-auto mt-3">  
<div class="cpy-right text-lg-right text-center">  
<p class="text-secondary">© 2020 All rights reserved  
<a href="http://w3layouts.com"> IT Project Team</a>  
</p>  
</div>  
</div>  
</div>  
</div>  
</div>  
</footer>  
<!-- //footer -->  
<!-- js-->  
<script src="js/jquery-2.2.3.min.js"></script>  
<!-- loading-gifJs -->  
<script src="js/modernizr.js"></script>  
<script>  
    //paste this code under head tag or in a seperate js file.  
    // Wait for window load  
    $(window).load(function () {  
        // Animate loader off screen  
        $(".se-pre-con").fadeOut("slow");  
    });  
</script>  
<!--// loading-gifJs -->  
<!-- Multiple select filter using jQuery -->  
<script src="js/custom-select.js"></script>  
<!-- //Multiple select filter using jQuery -->  
<!-- start-smooth-scrolling -->  
<script src="js/move-top.js">  
</script>  
<script src="js/easing.js"></script>  
<script>  
    jQuery(document).ready(function ($) {  
        $(".scroll").click(function (event) {  
            event.preventDefault();  
  
            $('html,body').animate({  
                scrollTop: $(this.hash).offset().top  
            }, 1000);  
        });  
    });  
</script>  
<!-- //end-smooth-scrolling -->  
<!-- smooth-scrolling-of-move-up -->
```

```

<script>
    $(document).ready(function () {
        /*
            var defaults = {
            containerID: 'toTop', // fading element id
            containerHoverID: 'toTopHover', // fading element hover id
            scrollSpeed: 1200,
            easingType: 'linear'
            };
        */

        $().UItoTop({
            easingType: 'easeOutQuart'
        });

    });
</script>
<script src="js/SmoothScroll.min.js"></script>
<!-- //smooth-scrolling-of-move-up -->
<!-- Bootstrap Core JavaScript -->
<script src="js/bootstrap.js">
</script>
<!-- //Bootstrap Core JavaScript -->
</body>

</html>

```

Back End – AddOwner.java

```
package Registration;
```

```
import java.io.IOException;
```

```
import javax.servlet.ServletException;
```

```
import javax.servlet.annotation.WebServlet;
```

```
import javax.servlet.http.HttpServlet;
```

```
import javax.servlet.http.HttpServletRequest;
```

```
import javax.servlet.http.HttpServletResponse;
```

```
import java.io.*;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
/**
 * Servlet implementation class AddOwner
 */
@WebServlet("/AddOwner")
public class AddOwner extends HttpServlet {
    private static final long serialVersionUID = 1L;

    /**
     * @see HttpServlet#HttpServlet()
     */
    public AddOwner() {
        super();
        // TODO Auto-generated constructor stub
    }

    /**
```

```
    * @see HttpServlet#doGet(HttpServletRequest request, HttpServletResponse response)
```

```
    */
```

```
    protected void doGet(HttpServletRequest request,
        HttpServletResponse response) throws
        ServletException, IOException {
```

```
        // TODO Auto-generated method stub
```

```
    }
```

```
    /**
```

```
    * @see HttpServlet#doPost(HttpServletRequest request, HttpServletResponse response)
```

```
    */
```

```
    protected void doPost(HttpServletRequest request,
        HttpServletResponse response) throws
        ServletException, IOException {
```

```
        // TODO Auto-generated method stub
```

```
        PrintWriter out=response.getWriter();
```

```
        FileInputStream fis=null;
```

```
        String str1="";
```

```
        String str2="";
```

```
        File file1=null;
```

```
String name=request.getParameter("name");
String email=request.getParameter("email");
String phone=request.getParameter("phone");
String pass=request.getParameter("pass");
String
filename=request.getParameter("photo");
    //  out.println("name= "+filename);

    //String
str=request.getServletContext().getRealPath(file1);

    String sql="insert into
dataowner(name,email,phone,password,photo)
values(?,?,?,?,";

    try
    {
        file1=new
File("C:\\Users\\HOME\\eclipse-workspace\\EffectiveSe
arch\\WebContent\\images\\"+filename);
str1=(String)file1.getAbsolutePath();
```

```
        Class.forName("com.mysql.jdbc.Driver");

        java.sql.Connection
con=DriverManager.getConnection("jdbc:mysql://localhost:3306/efficientsearch","root","root");

PreparedStatement ps=con.prepareStatement(sql);


ps.setString(1,name);
ps.setString(2,email);
ps.setString(3,phone);
ps.setString(4,pass);
fis=new FileInputStream(str1);
ps.setBinaryStream(5, fis, fis.available());
ps.executeUpdate();


response.sendRedirect("index.jsp");
    }

    catch(Exception e)
    {
```

```

        e.printStackTrace();
    }

}

}

```

DataOwnerLogin.jsp

```

<!-- Author: W3layouts
Author URL: http://w3layouts.com
License: Creative Commons Attribution 3.0 Unported
License URL: http://creativecommons.org/licenses/by/3.0/
-->
<!DOCTYPEHTML>
<html lang="zxx">

<head>
<title>Efficient Regular Language Search</title>
<metaname="viewport" content="width=device-width, initial-scale=1">
<metacharset="utf-8">
<metaname="keywords" content="Skill Point Responsive web template, Bootstrap Web
Templates, Flat Web Templates, Android Compatible web template,
SmartPhone Compatible web template, free WebDesigns for Nokia, Samsung, LG,
SonyEricsson, Motorola web design"/>
<script>
    addEventListener("load", function () {
        setTimeout(hideURLbar, 0);
    }, false);

    function hideURLbar() {
        window.scrollTo(0, 1);
    }
</script>

<!-- Bootstrap Core CSS -->
<link href="css/bootstrap.css" rel="stylesheet" type="text/css"/>
<!-- Custom CSS -->
<!-- animation -->
<link href="css/animate.css" rel="stylesheet" type="text/css" media="all">
<link href="css/style.css" rel="stylesheet" type="text/css"/>
<link href="css/screenshot_view.css" rel="stylesheet" type="text/css"/>
<!-- font-awesome icons -->
<link href="css/fontawesome-all.min.css" rel="stylesheet">

```

```
<!-- //Custom Theme files -->
<!-- online fonts -->
<linkhref="//fonts.googleapis.com/css?family=Poppins:100,100i,200,200i,300,300i,400,400i,500,500i,600,600i,700,700i,800,800i,900,900i"
rel="stylesheet">
<linkhref="//fonts.googleapis.com/css?family=Gentium+Book+Basic:400,400i,700i"rel="st
ylesheet">

<!--//online fonts -->

</head>

<body>
<divclass="se-pre-con"></div>
<!-- header -->
<header>
<divclass="header-top">
<divclass="container">
<divclass="row">
<divclass="col-md-6">
<!--
<ul class="d-flex header-agile"> -->
<li -->
<span class="fasfa-envelope-open"></span> -->
<a href="mailto:example@email.com"
class="text-white"></a> -->
<li -->
<li -->
<span class="fasfa-phone-volume"></span> -->
<p class="d-inline text-white"></p> -->
<li -->
</ul> -->
</div>
<divclass="col-md-6 header-right-agile">
<divclass="d-flex">
<!-- Multiple select filter -->
<!--
<select class="custom-select"> -->
<option value="HTML">Programming</option> -->
<option value="jQuery">Art & Design</option> -->
<option value="Pug">Languages</option> -->
<option value="SASS">UX Training</option> -->
<option value="Angular">Business</option> -->
<option value="React">Vocabulary</option> -->
<option value="Jade">Photography</option> -->
<option value="PHP">Inclusive-education</option>
-->
<option value="Java">New Technologies</option>
-->
</select> -->
<!-- Multiple select filter -->
<divclass="Login-wthree my-auto">
<!--
<a href="login.html" class="text-white
text-capitalize">login <span class="fasfa-sign-in-alt flash animated
infinite"></span></a> -->
</div>
```

```

</div>
</div>
</div>
</div>
</div>
<div class="header-bottom">
<div class="container">
<nav class="navbar navbar-expand-lg navbar-light p-0">
<h1><a class="navbar-brand" href="index.html">
<span>Efficient Search
<i class="w3-spacing"></i>
<!--          <span>Search -->
</a></h1>
<button class="navbar-toggler ml-lg-auto
ml-sm-5" type="button" data-toggle="collapse" data-target="#navbarSupportedContent"
aria-controls="navbarSupportedContent" aria-expanded="false" aria-label="Toggle
navigation">
<span class="navbar-toggler-icon"></span>
</button>
<div class="collapse navbar-collapse" id="navbarSupportedContent">
<ul class="navbar-nav text-center ml-auto">
<li class="nav-item active mr-lg-3 mt-lg-0 mt-4">
<a class="hover-fill" href="index.jsp" data-txthover="Home">Home</a>
</li>

</ul>
</div>
</nav>
</div>
</div>
<!--          <li class="nav-item">
<!--          <a class="hover-fill" href="contact.html"
data-txthover="Contact">Contact</a>
<!--          </li>

</header>
<!-- //header -->
<!-- banner -->
<!--      <div class="" -->
<!--      <div class="col-lg-8 screen-view-img order-md-0 order-1" -->
<!--           -->
<!--      </div> -->
<!--      <div class="" -->
<!--          <h3>skill point - the education template</h3> -->
<!--          <ul class="list-group mt-lg-3 pb-lg-0 pb-3" -->
<!--              <li class="list-group-item border-0" -->
<!--                  <i class="fasfa-check mr-3"></i>Fully Responsive </li> -->
<!--              <li class="list-group-item border-0" -->
<!--                  <i class="fasfa-check mr-3"></i>Built with valid HTML5 and
CSS3 code</li> -->
<!--              <li class="list-group-item border-0" -->
<!--                  <i class="fasfa-check mr-3"></i>Bootstrap4 Framework</li>
-->
<!--          <li class="list-group-item border-0" -->

```

```

<!--          <i class="fasfa-check mr-3"></i>12 HTML Pages</li> -->
<!--          <li class="list-group-item border-0"> -->
<!--          <i class="fasfa-check mr-3"></i>11 Accordion Styles</li> -->
<!--          <li class="list-group-item border-0"> -->
<!--          <i class="fasfa-check mr-3"></i>Easy to Use/Customize</li>
-->
<!--          <li class="list-group-item border-0"> -->
<!--          <i class="fasfa-check mr-3"></i>Clean and Commented
Code</li> -->
<!--          <li class="list-group-item border-0"> -->
<!--          <i class="fasfa-check mr-3"></i>Screenshot view</li> -->
<!--          <li class="list-group-item border-0"> -->
<!--          <i class="fasfa-check mr-3"></i> Cool Animated Loading
Icon</li> -->
<!--          <li class="list-group-item border-0"> -->
<!--          <i class="fasfa-check mr-3"></i>FilterablePortfolio</li> -->
<!--          </ul> -->
<!--          </div> -->
<!--          </div> -->
<!-- //banner -->
<!-- pages grid-->
<!--          <section class="py-lg-5 pages-sec"> -->
<!--          <div class="container py-md-5"> -->
<!--          <div class="py-5 text-center"> -->
<!--          <h3 class="text-white text-capitalize page-head">check out all
our pages</h3> -->
<!--          <p class="text-capitalize text-secondary mt-2">a nicely crafted
education theme, suitable for -->
<!--          educational institutions</p> -->
<!--          </div> -->
<!--          <div class="pages-row mt-lg-5"> -->
<!--          <!--          <div class="col-lg-4 col-md-6"> -->
<!--          <!--          <div class="page-grid-wthree"> -->
<!--          <!--          <div class="demo-page"> -->
<!--          <!--          <a href="home.html" target="_blank"> -->
<!--          <!--          </a> -->
<!--          <!--          </div> -->
<!--          <!--          <div class="demo-title text-center"> -->
<!--          <!--          <h4><a href="home.html"
target="_blank">home</a></h4> -->
<!--          <!--          </div> -->
<!--          <!--          </div> -->
<!--          <!--          </div> -->
<!--          <!--          </div> -->
<!--          <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->
<!--          <div class="demo-page"> -->
<!--          <a href="about.html" target="_blank"></a> -->
<!--          </div> -->
<!--          <div class="demo-title text-center"> -->
<!--          <h4><a href="about.html"
target="_blank">about</a></h4> -->
<!--          </div> -->

```

```

<!--          </div> -->
<!--      </div> -->
<!--      <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->
<!--              <div class="demo-page"> -->
<!--                  <a href="services.html" target="_blank"></a> -->
<!--                      </div> -->
<!--                          <div class="demo-title text-center"> -->
<!--                              <h4><a href="services.html"
target="_blank">services</a></h4> -->
<!--                                  </div> -->
<!--                                      </div> -->
<!--                                          </div> -->
<!--      <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->
<!--              <div class="demo-page"> -->
<!--                  <a href="portfolio.html" target="_blank"></a> -->
<!--                      </div> -->
<!--                          <div class="demo-title text-center"> -->
<!--                              <h4><a href="portfolio.html"
target="_blank">portfolio</a></h4> -->
<!--                                  </div> -->
<!--                                      </div> -->
<!--                                          </div> -->
<!--      <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->
<!--              <div class="demo-page"> -->
<!--                  <a href="pricingplans.html" target="_blank"> -->
<!--                      </a> -->
<!--                          </div> -->
<!--                              <div class="demo-title text-center"> -->
<!--                                  <h4><a href="pricingplans.html"
target="_blank">pricing plans</a></h4> -->
<!--                                      </div> -->
<!--                                          </div> -->
<!--                                              </div> -->
<!--      <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->
<!--              <div class="demo-page"> -->
<!--                  <a href="courses.html"> -->
<!--                      </a> -->
<!--                          </div> -->
<!--                              <div class="demo-title text-center"> -->
<!--                                  <h4><a href="courses.html"
target="_blank">courses</a></h4> -->
<!--                                      </div> -->
<!--                                          </div> -->
<!--                                              </div> -->
<!--      <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->

```

```

<!--          <div class="demo-page"> -->
<!--          <a href="single.html" target="_blank"> -->
<!--          </a> -->
<!--          </div> -->
<!--          <div class="demo-title text-center"> -->
<!--          <h4><a href="single.html" target="_blank">single
course</a></h4> -->
<!--          </div> -->
<!--          </div> -->
<!--          </div> -->
<!--          <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->
<!--          <div class="demo-page"> -->
<!--          <a href="team.html" target="_blank"> -->
<!--          </a> -->
<!--          </div> -->
<!--          <div class="demo-title text-center"> -->
<!--          <h4><a href="about.html"
target="_blank">team</a></h4> -->
<!--          </div> -->
<!--          </div> -->
<!--          </div> -->
<!--          <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->
<!--          <div class="demo-page"> -->
<!--          <a href="testimonials.html" target="_blank"> -->
<!--          </a> -->
<!--          </div> -->
<!--          <div class="demo-title text-center"> -->
<!--          <h4><a href="testimonials.html"
target="_blank">testimonials</a></h4> -->
<!--          </div> -->
<!--          </div> -->
<!--          </div> -->
<!--          <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->
<!--          <div class="demo-page"> -->
<!--          <a href="typography.html" target="_blank"> -->
<!--          </a> -->
<!--          </div> -->
<!--          <div class="demo-title text-center"> -->
<!--          <h4><a href="typography.html"
target="_blank">typography</a></h4> -->
<!--          </div> -->
<!--          </div> -->
<!--          </div> -->
<!--          <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->
<!--          <div class="demo-page"> -->

```

```

<!--          <a href="contact.html" target="_blank"></a> -->
<!--          </div> -->
<!--          <div class="demo-title text-center"> -->
<!--          <h4><a href="contact.html"
target="_blank">contact</a></h4> -->
<!--          </div> -->
<!--          </div> -->
<!--          </div> -->
<!--          <div class="col-lg-4 col-md-6"> -->
<!--          <div class="page-grid-wthree"> -->
<!--          <div class="demo-page"> -->
<!--          <a href="login.html" target="_blank"></a> -->
<!--          </div> -->
<!--          <div class="demo-title text-center"> -->
<!--          <h4><a href="Registration.jsp"
target="_blank">Registration</a></h4> -->
<!--          </div> -->
<!--          <div class="demo-title text-center"> -->
<!--          <h4><a href="login.html"
target="_blank">login</a></h4> -->
<!--          </div> -->

<!--          </div> -->
<!--          </div> -->
<!--          </div> -->
<!--          </div> -->
<!--          </section> -->
<!-- //pages grid-->
<!-- footer top -->
<div class="footer-top py-5">
<div class="container">
<div class="row footer-cform pt-lg-5">
<div class="col-lg-6">
<!--          <h5 class="footer-top-title">site navigation</h5> -->
<div class="footer-top-agileits">
<!--          <ul class="list-agileits d-flex"> -->
<!--          <li> -->
<!--          <a href="index.html" class="nav-link py-0 pl-0">
-->
<!--          Home -->
<!--          </a> -->
<!--          </li> -->
<!--          <li> -->
<!--          <a href="about.html" class="nav-link py-0"> -->
<!--          About Us -->
<!--          </a> -->
<!--          </li> -->
<!--          <li> -->
<!--          <a href="services.html" class="nav-link py-0">
-->
<!--          Services -->
<!--          </a> -->

```

```

<!-- </li> -->
<!-- <li> -->
<!-- <a href="portfolio.html" class="nav-link py-0">
-->
<!-- portfolio -->
<!-- </a> -->
<!-- </li> -->
<!-- </ul> -->
<!-- <ul class="list-agileits d-flex"> -->
<!-- <li> -->
<!-- <a href="courses.html" class="nav-link py-0
pl-0"> -->
<!-- courses -->
<!-- </a> -->
<!-- </li> -->
<!-- <li> -->
<!-- <a href="index.html" class="nav-link py-0"> -->
<!-- privacy policy -->
<!-- </a> -->
<!-- </li> -->
<!-- <li> -->
<!-- <a href="contact.html" class="nav-link py-0">
-->
<!-- Contact Us -->
<!-- </a> -->
<!-- </li> -->
<!-- </ul> -->
</div>
<div class="footer-cont-btm">
<h5 class="footer-top-title">OWNER LOGIN</h5>
<!-- <address class="my-4"> -->
<!-- <p>+4667 Woodland Terrace Folsom, California
916-983-6577.</p> -->
<!-- </address> -->
<!-- <ul class="d-flex header-agile pt-0"> -->
<!-- <li> -->
<!-- <span class="fasfa-envelope-open"></span> -->
<!-- <a href="mailto:example@email.com"
class="text-secondary">info@example.com</a> -->
<!-- </li> -->
<!-- <li> -->
<!-- <span class="fasfa-phone-volume"></span> -->
<!-- <p class="d-inline text-secondary">+456 123
7890</p> -->
<!-- </li> -->
<!-- </ul> -->
</div>
</div>
<div class="col-lg-6 wthree-form-left my-lg-0 mt-4">
<!-- <h5 class="footer-top-title">send us a message</h5> -->
<div class="footer-top-form">
<form action="OwnerLogin" method="post" class="footer-top-wthree">
<div class="form-group d-flex">
<label>

```

Name

```
</label>
<inputclass="form-control"type="text"placeholder="Johnson"name="user"required="">
</div>
<!--          <div class="form-group d-flex"> -->
<!--          <label> -->
<!--          Email -->
<!--          </label> -->
<!--          <input class="form-control" type="email"
placeholder="example@email.com" name="email" -->
<!--          required=""> -->
<!--          </div> -->
<!--          <div class="form-group d-flex"> -->
<!--          <label> -->
<!--          Phone -->
<!--          </label> -->
<!--          <input class="form-control" type="text"
placeholder="XXXX XXXX XX" name="email" -->
<!--          required=""> -->
<!--          </div> -->
<divclass="form-group d-flex">
<label>
```

Password

```
</label>
<inputclass="form-control"type="password"placeholder="XXXXXX"name="password"
required="">
</div>
<!--          <div class="form-group d-flex"> -->
<!--          <label> -->
<!--          Message -->
<!--          </label> -->
<!--          <textarea class="form-control" rows="5"
id="contactcomment" placeholder="Your message" -->
<!--          required></textarea> -->
<!--          </div> -->
<divclass="d-flex justify-content-end">
<buttontype="submit"class="btn btn-agile btn-block w-25">Login</button>
```

</div>

</form>

Forget Password

<style>

a

{

color: white;

}

</style>

</div>

</div>

</div>

</div>

[illegible]

```

// Animate loader off screen
    $(".se-pre-con").fadeOut("slow");;
});
</script>
<!--// loading-gifJs -->
<!-- Multiple select filter using jQuery -->
<scriptsrc="js/custom-select.js"></script>
<!-- //Multiple select filter using jQuery -->
<!-- start-smooth-scrolling -->
<scriptsrc="js/move-top.js">
</script>
<scriptsrc="js/easing.js"></script>
<script>
    jQuery(document).ready(function ($) {
        $(".scroll").click(function (event) {
            event.preventDefault();

            $('html,body').animate({
                scrollTop: $(this.hash).offset().top
            }, 1000);
        });
    });
</script>
<!-- //end-smooth-scrolling -->
<!-- smooth-scrolling-of-move-up -->
<script>
    $(document).ready(function () {
/*
        var defaults = {
            containerID: 'toTop', // fading element id
            containerHoverID: 'toTopHover', // fading element hover id
            scrollSpeed: 1200,
            easingType: 'linear'
        };
        */

        $.UItoTop({
            easingType: 'easeOutQuart'
        });

    });
</script>
<scriptsrc="js/SmoothScroll.min.js"></script>
<!-- //smooth-scrolling-of-move-up -->
<!-- Bootstrap Core JavaScript -->
<scriptsrc="js/bootstrap.js">
</script>
<!-- //Bootstrap Core JavaScript -->
</body>

</html>

```

Back End – OwnerLogin.java

```
package Login;

import java.awt.image.BufferedImage;
import java.io.ByteArrayInputStream;
import java.io.File;
import java.io.FileInputStream;
import java.io.FileOutputStream;
import java.io.IOException;
import java.io.PrintWriter;
import java.sql.Blob;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.sql.ResultSet;

import javax.imageio.ImageIO;

import java.sql.*;
import java.util.Base64;
```

```
import java.io.*;
```

```
import javax.servlet.ServletException;
```

```
import javax.servlet.annotation.WebServlet;
```

```
import javax.servlet.http.HttpServlet;
```

```
import javax.servlet.http.HttpServletRequest;
```

```
import javax.servlet.http.HttpServletResponse;
```

```
import javax.servlet.http.HttpSession;
```

```
/**
```

```
 * Servlet implementation class OwnerLogin
```

```
 */
```

```
@WebServlet("/OwnerLogin")
```

```
public class OwnerLogin extends HttpServlet {
```

```
    private static final long serialVersionUID = 1L;
```

```
/**
```

```
 * @see HttpServlet#HttpServlet()
```

```
 */
```

```
public OwnerLogin() {
```

```
super();

// TODO Auto-generated constructor stub
}


/**
 * @see HttpServlet#doGet(HttpServletRequest request,
HttpServletResponse response)
 */

protected void doGet(HttpServletRequest request,
HttpServletResponse response) throws ServletException, IOException {

    // TODO Auto-generated method stub

}


/**
 * @see HttpServlet#doPost(HttpServletRequest request,
HttpServletResponse response)
 */

protected void doPost(HttpServletRequest request,
HttpServletResponse response) throws ServletException, IOException {

    // TODO Auto-generated method stub
```

```
PrintWriter out=response.getWriter();
```

```
String user="";
```

```
String pass="";
```

```
String str2="";
```

```
String str3="";
```

```
String sql3="";
```

```
File f1=null;
```

```
FileOutputStream fos=null;
```

```
FileInputStream fis=null;
```

```
PreparedStatement ps2=null;
```

```
int a=0;
```

```
String username=request.getParameter("user");
```

```
String password=request.getParameter("password");
```

```
//out.println(username+" "+password);
```

```
String sql="select name,password,photo from  
dataowner";
```

```
String sql2="insert into  
ownerlogindetails(name,date,Intime,Outtime,Timespent)  
values(?,curdate(),curtime(),'00:00:00','0.00)";
```

```

        try
        {
            Class.forName("com.mysql.jdbc.Driver");

            java.sql.Connection
con=DriverManager.getConnection("jdbc:mysql://localhost:3306/efficie
ntsearch","root","root");

            java.sql.PreparedStatement
ps=con.prepareStatement(sql);

            ps2=con.prepareStatement(sql2);

            //sql3="select name,date,Intime from ownerlogin
details where ";

            ResultSet rs=ps.executeQuery();

            while(rs.next())
            {

                user=rs.getString(1);

                pass=rs.getString(2);

                //out.println(user+" "+pass);

                if(username.equals(user)&&password.equals(pass))
                {

```

```
        a=a+1;

        ps2.setString(1,username);

        ps2.executeUpdate();

        Blob b=rs.getBlob(3);

        byte[] barray=b.getBytes(1,(int)b.length());


        //str2=request.getServletContext().getRealPath("aaa.jpg");

        //str3=request.getServletContext().getContextPath();


        //str3=    str3+"images//bbb.jpg";

//        //out.println(str3);

        f1=new
        File("C:\\Users\\HOME\\eclipse-workspace\\EffectiveSearch\\WebConte
        nt\\images\\abc.jpg");

        f1.createNewFile();

//

//

        ByteArrayInputStream br=new ByteArrayInputStream(barray);
```

```

BufferedImage bi=ImageIO.read(br);

ImageIO.write(bi, "jpg",f1);

Base64.Encoder encoder=Base64.getEncoder();

String
result="data:image/png;base64,"+encoder.encodeToString(barray);

//

////

////

////out.println("done");

//

////

        HttpSession session=request.getSession();

        session.setAttribute("username", username);

//

session.setAttribute("imgsource",result);

////

response.sendRedirect("OwnerProfile.jsp");

        }

    }

```

```

    }
    catch(Exception e)
    {
        e.printStackTrace();
    }
}
}

```

Aes Pattern – Generate Secret Key

```

public static SecretKey generateKey(int n) throws NoSuchAlgorithmException {
    KeyGenerator keyGenerator = KeyGenerator.getInstance("AES");
    keyGenerator.init(n); SecretKey key = keyGenerator.generateKey(); return key; }

```

Encryption

```

public static void encryptFile(String algorithm, SecretKey key, IvParameterSpec
iv,
    File inputFile, File outputFile) throws IOException,
NoSuchPaddingException,
    NoSuchAlgorithmException, InvalidAlgorithmParameterException,
InvalidKeyException,
    BadPaddingException, IllegalBlockSizeException {

    Cipher cipher = Cipher.getInstance(algorithm);
    cipher.init(Cipher.ENCRYPT_MODE, key, iv);
    FileInputStream inputStream = new FileInputStream(inputFile);
    FileOutputStream outputStream = new FileOutputStream(outputFile);
    byte[] buffer = new byte[64];
    int bytesRead;
    while ((bytesRead = inputStream.read(buffer)) != -1) {
        byte[] output = cipher.update(buffer, 0, bytesRead);
        if (output != null) {
            outputStream.write(output);
        }
    }
    byte[] outputBytes = cipher.doFinal();
    if (outputBytes != null) {
        outputStream.write(outputBytes);
    }
    inputStream.close();
    outputStream.close();
}

```

Please note that trying to read the entire file – particularly if it is large – into memory is not recommended. Instead, we encrypt a buffer at a time.

For decrypting a file, we use similar steps and initialize our cipher using *DECRYPT_MODE* as we saw before.

Again, let's define a test method for encrypting and decrypting a text file. In this method, we read the *baeldung.txt* file from the test resource directory, encrypt it into a file called *baeldung.encrypted*, and then decrypt the file into a new file:

```

@Test
void givenFile_whenEncrypt_thenSuccess()
throws NoSuchAlgorithmException, IOException, IllegalBlockSizeException,
    InvalidKeyException, BadPaddingException,
InvalidAlgorithmParameterException,
    NoSuchPaddingException {

    SecretKey key = AESUtil.generateKey(128);
    String algorithm = "AES/CBC/PKCS5Padding";
    IvParameterSpec ivParameterSpec = AESUtil.generateIv();
    Resource resource = new ClassPathResource("inputFile/baeldung.txt");
}

```

```

File inputFile = resource.getFile();
File encryptedFile = new File("classpath:baeldung.encrypted");
File decryptedFile = new File("document.decrypted");
AESUtil.encryptFile(algorithm, key, ivParameterSpec, inputFile,
encryptedFile);
AESUtil.decryptFile(
    algorithm, key, ivParameterSpec, encryptedFile, decryptedFile);
assertThat(inputFile).hasSameTextualContentAs(decryptedFile);
}

```

Password-Based

We can do the AES encryption and decryption using the secret key that is derived from a given password.

For generating a secret key, we use the *getKeyFromPassword()* method. The encryption and decryption steps are the same as those shown in the string input section. We can then use the instantiated cipher and the provided secret key to perform the encryption.

Let's write a test method:

```

@Test
void givenPassword_whenEncrypt_thenSuccess()
throws InvalidKeySpecException, NoSuchAlgorithmException,
    IllegalBlockSizeException, InvalidKeyException, BadPaddingException,
    InvalidAlgorithmParameterException, NoSuchPaddingException {

    String plainText = "www.baeldung.com";
    String password = "baeldung";
    String salt = "12345678";
    IvParameterSpec ivParameterSpec = AESUtil.generateIv();
    SecretKey key = AESUtil.getKeyFromPassword(password, salt);
    String cipherText = AESUtil.encryptPasswordBased(plainText, key,
ivParameterSpec);
    String decryptedCipherText = AESUtil.decryptPasswordBased(
        cipherText, key, ivParameterSpec);
    Assertions.assertEquals(plainText, decryptedCipherText);
}

```

Integrated Gmail API for Forgetpassword – OwnerForgetPass.java

package forgetpassword;

```
import java.io.IOException;

import java.io.PrintWriter;

import java.sql.DriverManager;

import java.sql.PreparedStatement;

import java.util.Properties;

import java.util.Random;


import javax.mail.Message;

import javax.mail.PasswordAuthentication;

import javax.mail.Session;

import javax.mail.Transport;

import javax.mail.internet.InternetAddress;

import javax.mail.internet.MimeMessage;

import javax.servlet.ServletException;

import javax.servlet.annotation.WebServlet;

import javax.servlet.http.HttpServlet;

import javax.servlet.http.HttpServletRequest;

import javax.servlet.http.HttpServletResponse;

import javax.servlet.http.HttpSession;
```

```

/**
 * Servlet implementation class OwnerForgetPass
 */
@WebServlet("/OwnerForgetPass")
public class OwnerForgetPass extends HttpServlet {
    private static final long serialVersionUID = 1L;

    /**
     * @see HttpServlet#HttpServlet()
     */
    public OwnerForgetPass() {
        super();
        // TODO Auto-generated constructor stub
    }

    /**
     * @see HttpServlet#doGet(HttpServletRequest request,
     *                                     HttpServletResponse response)
     */

```

```
protected void doGet(HttpServletRequest request,
HttpServletRequest response) throws ServletException, IOException {

    // TODO Auto-generated method stub

}
```

```
/**
 * @see HttpServlet#doPost(HttpServletRequest request,
HttpServletRequest response)
 */
```

```
protected void doPost(HttpServletRequest request,
HttpServletRequest response) throws ServletException, IOException {

    // TODO Auto-generated method stub

    int a=0;

    Random r=new Random();

    int e =r.nextInt(10);

    String e1=String.valueOf(e);

    int b =r.nextInt(10);
```

```
String b1=String.valueOf(b);
```

```
int c =r.nextInt(10);
```

```
String c1=String.valueOf(c);
```

```
int d =r.nextInt(10);
```

```
String d1=String.valueOf(d);
```

```
String otp=e1+b1+c1+d1;
```

```
try
```

```
{
```

```
PrintWriter out=response.getWriter();
```

```
String email=request.getParameter("email");
```

```
HttpSession emailname=request.getSession();
```

```
emailname.setAttribute("email", email);
```

```
a=(int)(Math.random()*10000);
```

```
String sql="update dataowner set otp="+a+" where email='"+email+"'";
```

```
Class.forName("com.mysql.jdbc.Driver");
```

```
        java.sql.Connection  
con=DriverManager.getConnection("jdbc:mysql://localhost:3306/efficie  
ntsearch","root","root");
```

```
PreparedStatement ps=con.prepareStatement(sql);
```

```
        ps.executeUpdate();
```

```
        final String from="ganesh.balanayagam01@gmail.com";
```

```
        String username="Administrator";
```

```
        final String password="Bala01@1989";
```

```
        //get properties
```

```
        Properties props = new Properties();
```

```
        props.put("mail.smtp.host", "smtp.gmail.com");
```

```
        props.put("mail.smtp.socketFactory.port", "465");
```

```
        props.put("mail.smtp.socketFactory.class", "javax.net.ssl.SSLSocketFact  
ory");
```

```
        props.put("mail.smtp.auth", "true");
```

```
        props.put("mail.smtp.port", "465");
```

```

//get session

Session session = Session.getDefaultInstance(props,
    new javax.mail.Authenticator() {
        public PasswordAuthentication getPasswordAuthentication()
    {
        return new PasswordAuthentication(from,password);
    }
    });

//compose message

MimeMessage message = new MimeMessage(session);
message.addRecipient(Message.RecipientType.TO,new
InternetAddress(email));

message.setSubject("OTP");
message.setText("Otp is "+otp);

String sql1="update dataowner set otp="+otp+" where
email='"+email+"'";

PreparedStatement ps1=con.prepareStatement(sql1);
ps1.executeUpdate();

```

```
//send message

Transport.send(message);

// out.println("message sent successfully");


response.sendRedirect("PasswordOtp.jsp");


    }

    catch (Exception ee) {
throw new RuntimeException(ee);
    }
}

}
```

8.CONCLUSION

In this paper, we propose a privacy-preserving multikeyword search scheme with lightweight fine-grained access control (MRSF). Compared with previous schemes, besides realizing access control, MRSF achieves a better search performance and higher security level. In order to improve the practicability and security of MRSF, Formal security definitions and corresponding analysis show that MRSF is IND-CLS-CPA secure, we also prove

that MRSF is resistant to the representative KPAs. Finally, extensive evaluations demonstrate the influential factors for search accuracy and efficiency of MRSF.

FUTURE ENHANCEMENT

MRSF technique is applied here and based on this we can directly read the keyword of a particular data when it is in the cipher text form itself from the cloud.

9.EXPERIMENTAL RESULT AND DISCUSSION

The existing works over access control mostly focus on complicated methods such as Cipher-Policy Attribute-Based Encryption (CP-ABE) and the Cipher-Policy Attribute-Based Keyword Search (CP-ABKS). CP-ABE schemes incur heavy computational costs, which often grow with the complexity. Thus, inventing a light-weight access control mechanism over keyword search schemes is still in demand.

10. REFERENCES

- C. Wang, N. Cao, J. Li, K. Ren, and W. Lou, "Secure ranked keyword search over encrypted cloud data," in IEEE International Conference on Distributed Computing Systems, 2010.
- L. Zhang, Y. Zhang, and H. Ma, "Privacy-preserving and dynamic multi-attribute conjunctive keyword search over encrypted cloud data," IEEE Access, vol. 6, pp. 34 214–34 225, 2018.
- N. Cao, C. Wang, M. Li, K. Ren, and W. Lou, "Privacy-preserving multi-keyword ranked search over encrypted cloud data," IEEE Transactions on Parallel and Distributed Systems, vol. 25, no. 1, pp. 222–233, Jan 2014.