WEB REST API

JEETOO STUART

BSE21BFT2-2210_22803

WEB SERVICES

Contents

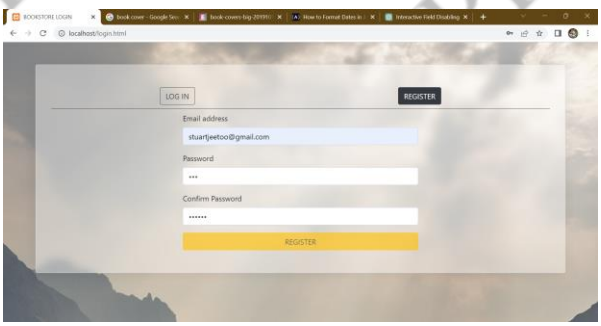
SYSTEM ARCHITECTURE

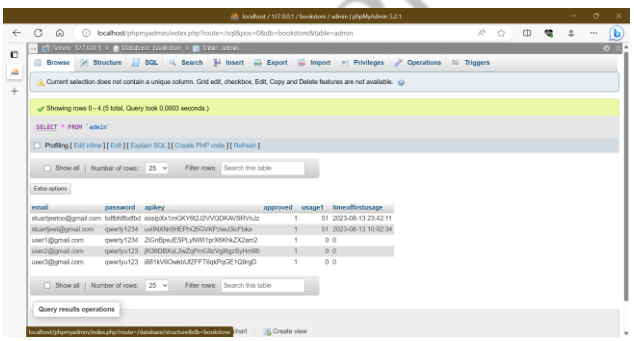
1. User register account
2. User is attributed a generated api key but not yet approved
3. User can login to see his api key and its information
4. Admin login and can choose between approve user, add books and monitor app
5. If user approve it can use it to search but he has a limit of 50 usage per day which is reset each 24 hours

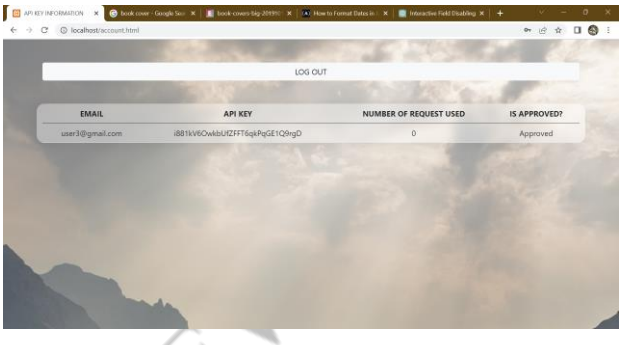
IMPLEMENTED FUNCTIONALITIES

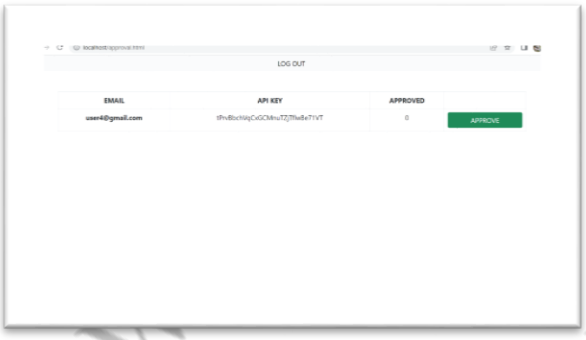
1. Get book(s) information by title
2. Get book(s) information by author (one author can write multiple books)
3. Get book(s) information by publication year
4. Get book(s) information by category
5. Get book information by author and category
6. Get book information by author and publication year
7. The response data formats for the web service are JSON and XML, depending on the choice of the programmer. JSON is the default response.
8. Your system must cater for a unique API key to be generated and allocated to each registered programmer. This key must be specified in each request. Your system therefore needs an interface which allows for registration and allocation of API Key. An administrator should approve a request for API key.
9. The web service will allow only 50 requests per day per API key.
10. An admin mode to manage website and approve user
11. The web service provides proper error messages/codes.

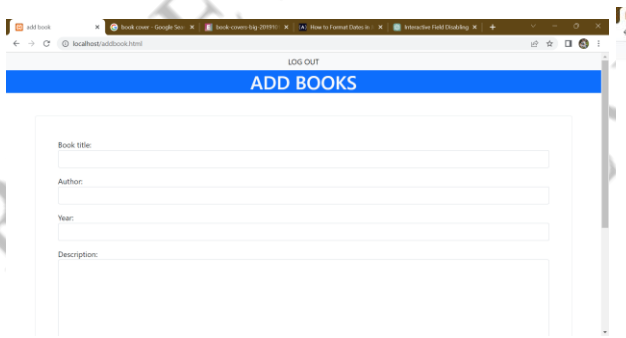
TESTING(IMAGES)

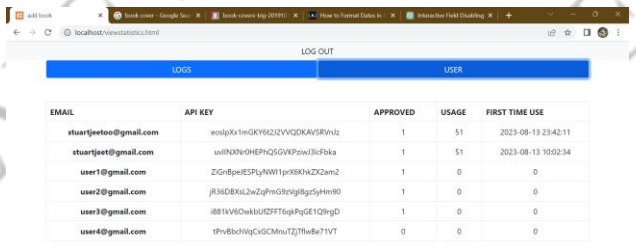


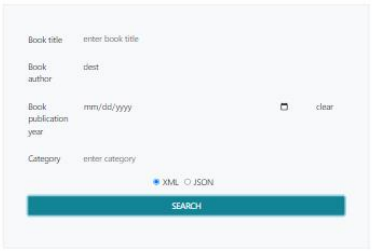


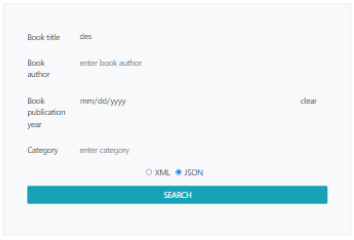




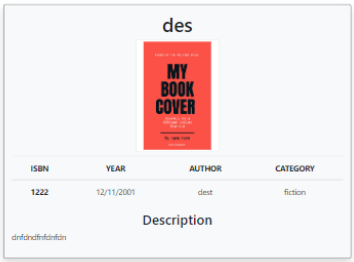


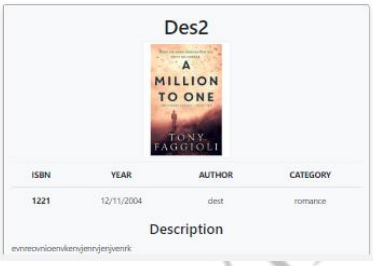


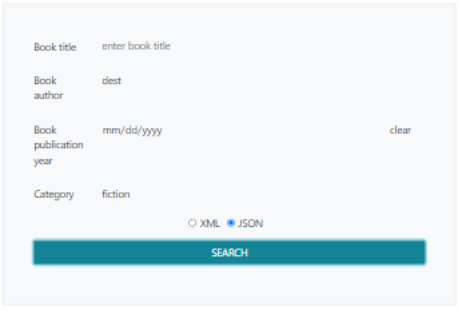

Book title
enter book title
Book author
dest
Book publication year
mm/dd/yyyy
clear
Category
enter category
XML
JSON
SEARCH

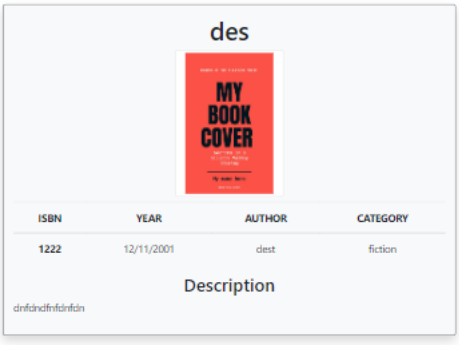

Book title
des
Book author
enter book author
Book publication year
mm/dd/yyyy
clear
Category
enter category
XML
JSON
SEARCH


des
MY BOOK COVER
ISBN
YEAR
AUTHOR
CATEGORY
1222
12/11/2001
dest
fiction
Description
dnfdndfnfdnfdn


des
MY BOOK COVER
ISBN
YEAR
AUTHOR
CATEGORY
1222
12/11/2001
dest
fiction
Description
dnfdndfnfdnfdn


Des2
A MILLION TO ONE
TONY FAGGIOLI
ISBN
YEAR
AUTHOR
CATEGORY
1221
12/11/2004
dest
romance
Description
evnreovnioenvkenvjenvjenjvenrk


Book title
enter book title
Book author
dest
Book publication year
mm/dd/yyyy
clear
Category
fiction
XML
JSON
SEARCH


des
MY BOOK COVER
ISBN
YEAR
AUTHOR
CATEGORY
1222
12/11/2001
dest
fiction
Description
dnfdndfnfdnfdn

CLIENT CODE:

```
// Define an API key

var apikey1 = "ZiGnBpeJESPLyNWI1prX6KhkZX2am2";

// Get a reference to an HTML element with the ID "display"

let container = document.getElementById("display");

// Define a function called "change"

function change() {

 // Get values from input fields using jQuery

 var title = $("#title").val();

 var author = $("#author").val();

 var publicationyear = $("#publicationyear").val();

 var category = $("#category").val();

 // If an author is entered, disable the title field

 if (author) {

  $("#title").prop("disabled", true);

 }

 // If a title is entered, disable author, publication year, and category fields

 if (title) {

  $("#author, #publicationyear, #category").prop("disabled", true);

 }

 // If a publication year is entered, disable title and category fields

 if (publicationyear) {

  $("#title, #category").prop("disabled", true);

 }

 // If a category is entered, disable title and publication year fields

 if (category) {

  $("#title, #publicationyear").prop("disabled", true);

 }

}


// Define a function called "search"
```

```
function search() {
 // Get the selected format from radio buttons using jQuery
 var format = $('input[name="inlineRadioOptions"]:checked').val();

 // Get values from input fields using jQuery
 var title = $("#title").val();
 var author = $("#author").val();
 var publicationyear = $("#publicationyear").val();
 var category = $("#category").val();
 // Construct the URL for API request based on user input
 var url = "http://localhost:80/bookfunction.php?apikey=" + apikey1 +
        "&format=" + format +
        "&title=" + title +
        "&author=" + author +
        "&publicationyear=" + publicationyear +
        "&category=" + category;
 // Log the constructed URL to the console for debugging
 console.log(url);
 // Check the selected format and make an API request
 if (format == "JSON") {
  $.get(url, function(data, status) {
   // Handle the JSON response
   console.log(typeof data);
   const obj = JSON.parse(data);
   console.log(obj);
   // Check if the response contains data
   if (Object.keys(obj).length == 0) {
    alert("Book not found");
   } else {
    // Construct HTML to display the retrieved book information
    let container = document.getElementById("display");
    var table1 = "";
```

```
    // Iterate through the JSON data and create display elements
    for (let i = 0; i < obj.length; i++) {
      table1 += "<div class=\"container p-3 mt-5 border border-dark rounded bg-light shadow\">" +
        "<h1 class=\"d-flex justify-content-center h1\">" + obj[i]["title"] + "</h1>" +
        "<img src=\"" + obj[i]["cover"] + "\" alt=\"image\" class=\"container img-thumbnail w-25 d-flex justify-center mt-2\">" +
        "<table class=\"table mt-2\">" +
        "<thead>" +
        "<tr>" +
        "<th scope=\"col\" style=\"text-align:center\">ISBN</th>" +
        "<th scope=\"col\" style=\"text-align:center\">YEAR</th>" +
        "<th scope=\"col\" style=\"text-align:center\">AUTHOR</th>" +
        "<th scope=\"col\" style=\"text-align:center\">CATEGORY</th>" +
        "</tr>" +
        "</thead>" +
        "<tr>" +
        "<th style=\"text-align:center\">" + obj[i]["isbn"] + "</th>" +
        "<td style=\"text-align:center\">" + obj[i]["year"] + "</td>" +
        "<td style=\"text-align:center\">" + obj[i]["author"] + "</td>" +
        "<td style=\"text-align:center\">" + obj[i]["category"] + "</td>" +
        "</tr>" +
        "<tbody>" +
        "</tbody>" +
        "</table>" +
        "<h1 class=\"d-flex justify-content-center mt-2 h3\">Description</h1>" +
        "<p class=\"fs-5 mt-2 text-wrap\">" + obj[i]["description"] + "</p>" +
        "</div>";
    }
    // Display the constructed HTML
    container.innerHTML = table1;
  }
 });
}
if (format == "XML") {
```

```
// Modify the URL for XML format
url = "http://localhost:80/bookfunction1.php?apikey=" + apikey1 +
    "&format=" + format +
    "&title=" + title +
    "&author=" + author +
    "&publicationyear=" + publicationyear +
    "&category=" + category;
$.get(url, function(data, status) {
 try {
  // Parse the XML data
  var serializer = new XMLSerializer();
  var xmlStringAgain = serializer.serializeToString(data);
  parser = new DOMParser();
  xmlDoc = parser.parseFromString(xmlStringAgain, "text/xml");
  var entries = xmlDoc.querySelectorAll('entry');
  let container = document.getElementById("display");
  var table1 = "";

  // Iterate through the XML entries and create display elements
  entries.forEach(function(entry) {
   var title = entry.querySelector('title').textContent;
   var author = entry.querySelector('author').textContent;
   var cover = entry.querySelector('cover').textContent;
   var isbn = entry.querySelector('isbn').textContent;
   var year = entry.querySelector('year').textContent;
   var category = entry.querySelector('category').textContent;
   var description = entry.querySelector('description').textContent;
   table1 += "<div class=\"container p-3 mt-5 border border-dark rounded bg-light shadow\">" +
    "<h1 class=\"d-flex justify-content-center h1\">" + title + "</h1>" +
    "<img src=\"" + cover + "\" alt=\"image\" class=\"container img-thumbnail w-25 d-flex justify-center mt-2\">" +
    "<table class=\"table mt-2\">" +
    "<thead>" +
    "<tr>" +
```

```
            "<th scope=\"col\" style=\"text-align:center\">ISBN</th>" +
            "<th scope=\"col\" style=\"text-align:center\">YEAR</th>" +
            "<th scope=\"col\" style=\"text-align:center\">AUTHOR</th>" +
            "<th scope=\"col\" style=\"text-align:center\">CATEGORY</th>" +
            "</tr>" +
            "</thead>" +
            "<tr>" +
            "<th style=\"text-align:center\">" + isbn + "</th>" +
            "<td style=\"text-align:center\">" + year + "</td>" +
            "<td style=\"text-align:center\">" + author + "</td>" +
            "<td style=\"text-align:center\">" + category + "</td>" +
            "</tr>" +
            "<tbody>" +
            "</tbody>" +
            "</table>" +
            "<h1 class=\"d-flex justify-content-center mt-2 h3\">Description</h1>" +
            "<p class=\"fs-5 mt-2 text-wrap\">" + description + "</p>" +
            "</div>";
          });
          // Display the constructed HTML
          container.innerHTML = table1;
        } catch (error) {
          alert("Book not found");
        }
      });
    }
}
```

PHP JSON REQUEST CODE FOR SEARCH CLIENT:

```
$title = null;
$author = null;
$publicationyear = null;
$category = null;
```

```
$format = null;
$apikey = null;
$now = new DateTime(); // Get current date and time
$now = $now->format('Y-m-d H:i:s'); // Format the date and time

// Check for values in the GET parameters and assign them to variables
if (!empty($_GET['format'])) {
  $format = $_GET['format'];
}
if (!empty($_GET['apikey'])) {
  $apikey = $_GET['apikey'];
}
if (!empty($_GET['title'])) {
  $title = $_GET['title'];
}
if (!empty($_GET['author'])) {
  $author = $_GET['author'];
}
if (!empty($_GET['publicationyear'])) {
  $publicationyear = $_GET['publicationyear'];
}
if (!empty($_GET['category'])) {
  $category = $_GET['category'];
}

// SQL query to check if the API key is approved
$sql = "SELECT * FROM admin WHERE apikey='$apikey'";
$usage = "";
$usagetime = "";
$approved = "";
$email = "";
$result = $conn->query($sql);
```

```
 // Check if the query returned any rows
if ($result->num_rows > 0) {
  while ($row = $result->fetch_assoc()) {
    $usage = $row["usage1"];
    $usagetime = $row["timeoffirstusage"];
    $approved = $row["approved"];
    $email = $row["email"];
  }
}

// Check if the API key is not approved
if ($approved == 0) {
  echo "Not yet approved";
}

// Check usage and limit
if ($usage > 50 && $approved == "1") {
  $time_str = $usagetime;
  $given_time = new DateTime($time_str);
  $current_time = new DateTime();
  $interval_seconds = $current_time->getTimestamp() - $given_time->getTimestamp();
  $twenty_four_hours_in_seconds = 24 * 60 * 60;

  if (($interval_seconds) >= $twenty_four_hours_in_seconds) {
    // Reset usage and usage time if 24 hours have passed
    $sql = "UPDATE ADMIN SET timeoffirstusage='0', usage1=0 WHERE apikey='$apikey'";
    $conn->query($sql);
  } else {
    echo "Limit reached";
  }
}

// Check usage and perform search if approved
```

```
if ($usage < 51 && $approved == "1") {
 if ($usage == 0) {
  // Update usage count and time for the first usage
  $sql = "UPDATE ADMIN SET timeoffirstusage='$now', usage1=1 WHERE apikey='$apikey'";
  $conn->query($sql);

  if ($format == "JSON") {
   // Perform search and return JSON response
   if ($title != "" && $author == "" && $publicationyear == "" && $category == "") {
    $sql = "SELECT * FROM books WHERE title='$title'";
    $result = $conn->query($sql);
    $emparray = array();

    while ($row = mysqli_fetch_assoc($result)) {
     $emparray[] = $row;
    }
    echo json_encode($emparray);
   }
    if($title==""&&$author!=""&&$publicationyear==""&&$category==""){
   $sql = "SELECT * FROM books WHERE author='$author'";
   $result = $conn->query($sql);
   $emparray = array();
      while($row =mysqli_fetch_assoc($result))
      {
            $emparray[] = $row;
      }
   echo json_encode($emparray);
  }
  if($title==""&&$author==""&&$publicationyear!=""&&$category==""){
   $sql = "SELECT * FROM books WHERE publicationyear='$publicationyear'";
   $result = $conn->query($sql);
   $emparray = array();
      while($row =mysqli_fetch_assoc($result))
```

```
    {
        $emparray[] = $row;
    }
  echo json_encode($emparray);
}
if($title==""&&$author==""&&$publicationyear==""&&$category!=""){
  $sql = "SELECT * FROM books WHERE category='$category'";
  $result = $conn->query($sql);
  $emparray = array();
    while($row =mysqli_fetch_assoc($result))
    {
        $emparray[] = $row;
    }
  echo json_encode($emparray);
}
if($title==""&&$author!=""&&$publicationyear==""&&$category!=""){
  $sql = "SELECT * FROM books WHERE author='$author' AND category='$category'";
  $result = $conn->query($sql);
  $emparray = array();
    while($row =mysqli_fetch_assoc($result))
    {
        $emparray[] = $row;
    }
  echo json_encode($emparray);
}
if($title==""&&$author!=""&&$publicationyear!=""&&$category==""){
  $sql = "SELECT * FROM books WHERE author='$author' AND category='$category'";
  $result = $conn->query($sql);
  $emparray = array();
    while($row =mysqli_fetch_assoc($result))
    {
        $emparray[] = $row;
    }
```

```
    echo json_encode($emparray);
    }
    $sql = "INSERT INTO session VALUES (?, ?, ?, ?)";
    $stmt = $conn->prepare($sql);
$stmt->bind_param("ssss", $apikey, $email, $now, $format);
$stmt->execute();
    }

  }else{
    $usage = $usage + 1;
    $sql = "UPDATE ADMIN SET usage1=$usage WHERE apikey='$apikey'";
    $conn->query($sql);
    if ($format=="JSON"){
    if($title!=""&&$author==""&&$publicationyear==""&&$category==""){
     $sql = "SELECT * FROM books WHERE title='$title'";
     $result = $conn->query($sql);
     $emparray = array();
        while($row =mysqli_fetch_assoc($result))
        {
                $emparray[] = $row;
        }
     echo json_encode($emparray);

    }
    if($title==""&&$author!=""&&$publicationyear==""&&$category==""){
     $sql = "SELECT * FROM books WHERE author='$author'";
     $result = $conn->query($sql);
     $emparray = array();
        while($row =mysqli_fetch_assoc($result))
        {
                $emparray[] = $row;
        }
     echo json_encode($emparray);
```

```
}
if($title==""&&$author==""&&$publicationyear!=""&&$category==""){
  $sql = "SELECT * FROM books WHERE publicationyear='$publicationyear'";
  $result = $conn->query($sql);
  $emparray = array();
     while($row =mysqli_fetch_assoc($result))
     {
          $emparray[] = $row;
     }
  echo json_encode($emparray);
}
if($title==""&&$author==""&&$publicationyear==""&&$category!=""){
  $sql = "SELECT * FROM books WHERE category='$category'";
  $result = $conn->query($sql);
  $emparray = array();
     while($row =mysqli_fetch_assoc($result))
     {
          $emparray[] = $row;
     }
  echo json_encode($emparray);
}
if($title==""&&$author!=""&&$publicationyear==""&&$category!=""){
  $sql = "SELECT * FROM books WHERE author='$author' AND category='$category'";
  $result = $conn->query($sql);
  $emparray = array();
     while($row =mysqli_fetch_assoc($result))
     {
          $emparray[] = $row;
     }
  echo json_encode($emparray);
}
if($title==""&&$author!=""&&$publicationyear!=""&&$category==""){
  $sql = "SELECT * FROM books WHERE author='$author' AND category='$category'";
```

```
  $result = $conn->query($sql);
  $emparray = array();
      while($row =mysqli_fetch_assoc($result))
      {
            $emparray[] = $row;
      }
  echo json_encode($emparray);
 }

  // Record the session in the database
  $sql = "INSERT INTO session VALUES (?, ?, ?, ?)";
  $stmt = $conn->prepare($sql);
  $stmt->bind_param("ssss", $apikey, $email, $now, $format);
  $stmt->execute();
 }
} else {
 // Update usage count for subsequent usages
 $usage = $usage + 1;
 $sql = "UPDATE ADMIN SET usage1=$usage WHERE apikey='$apikey'";
 $conn->query($sql);

 if ($format == "JSON") {
  // Perform search and return JSON response
  if ($title != "" && $author == "" && $publicationyear == "" && $category == "") {
   $sql = "SELECT * FROM books WHERE title='$title'";
   $result = $conn->query($sql);
   $emparray = array();

   while ($row = mysqli_fetch_assoc($result)) {
    $emparray[] = $row;
   }
   echo json_encode($emparray);
  }
```

```
if($title==""&&$author!=""&&$publicationyear==""&&$category==""){
  $sql = "SELECT * FROM books WHERE author='$author'";
  $result = $conn->query($sql);
  $emparray = array();
      while($row =mysqli_fetch_assoc($result))
      {
            $emparray[] = $row;
      }
  echo json_encode($emparray);
}
if($title==""&&$author==""&&$publicationyear!=""&&$category==""){
  $sql = "SELECT * FROM books WHERE publicationyear='$publicationyear'";
  $result = $conn->query($sql);
  $emparray = array();
      while($row =mysqli_fetch_assoc($result))
      {
            $emparray[] = $row;
      }
  echo json_encode($emparray);
}
if($title==""&&$author==""&&$publicationyear==""&&$category!=""){
  $sql = "SELECT * FROM books WHERE category='$category'";
  $result = $conn->query($sql);
  $emparray = array();
      while($row =mysqli_fetch_assoc($result))
      {
            $emparray[] = $row;
      }
  echo json_encode($emparray);
}
if($title==""&&$author!=""&&$publicationyear==""&&$category!=""){
  $sql = "SELECT * FROM books WHERE author='$author' AND category='$category'";
  $result = $conn->query($sql);
```

```
    $emparray = array();
        while($row =mysqli_fetch_assoc($result))
        {
            $emparray[] = $row;
        }
    echo json_encode($emparray);
   }
   if($title==""&&$author!=""&&$publicationyear!=""&&$category==""){
    $sql = "SELECT * FROM books WHERE author='$author' AND category='$category'";
    $result = $conn->query($sql);
    $emparray = array();
        while($row =mysqli_fetch_assoc($result))
        {
            $emparray[] = $row;
        }
    echo json_encode($emparray);
   }
   $sql = "INSERT INTO session VALUES (?, ?, ?, ?)";
   $stmt = $conn->prepare($sql);
$stmt->bind_param("ssss", $apikey, $email, $now, $format);
$stmt->execute();
   }

  }else{
   $usage = $usage + 1;
   $sql = "UPDATE ADMIN SET usage1=$usage WHERE apikey='$apikey'";
   $conn->query($sql);
   if ($format=="JSON"){
   if($title!=""&&$author==""&&$publicationyear==""&&$category==""){
    $sql = "SELECT * FROM books WHERE title='$title'";
    $result = $conn->query($sql);
    $emparray = array();
        while($row =mysqli_fetch_assoc($result))
```

```
    {
        $emparray[] = $row;
    }
  echo json_encode($emparray);

}
if($title==""&&$author!=""&&$publicationyear==""&&$category==""){
  $sql = "SELECT * FROM books WHERE author='$author'";
  $result = $conn->query($sql);
  $emparray = array();
    while($row =mysqli_fetch_assoc($result))
    {
        $emparray[] = $row;
    }
  echo json_encode($emparray);
}
if($title==""&&$author==""&&$publicationyear!=""&&$category==""){
  $sql = "SELECT * FROM books WHERE publicationyear='$publicationyear'";
  $result = $conn->query($sql);
  $emparray = array();
    while($row =mysqli_fetch_assoc($result))
    {
        $emparray[] = $row;
    }
  echo json_encode($emparray);
}
if($title==""&&$author==""&&$publicationyear==""&&$category!=""){
  $sql = "SELECT * FROM books WHERE category='$category'";
  $result = $conn->query($sql);
  $emparray = array();
    while($row =mysqli_fetch_assoc($result))
    {
        $emparray[] = $row;
```

```
    }
    echo json_encode($emparray);
   }
   if($title==""&&$author!=""&&$publicationyear==""&&$category!=""){
    $sql = "SELECT * FROM books WHERE author='$author' AND category='$category'";
    $result = $conn->query($sql);
    $emparray = array();
        while($row =mysqli_fetch_assoc($result))
        {
              $emparray[] = $row;
        }
    echo json_encode($emparray);
   }
   if($title==""&&$author!=""&&$publicationyear!=""&&$category==""){
    $sql = "SELECT * FROM books WHERE author='$author' AND category='$category'";
    $result = $conn->query($sql);
    $emparray = array();
        while($row =mysqli_fetch_assoc($result))
        {
              $emparray[] = $row;
        }
    echo json_encode($emparray);
   }
    // Record the session in the database
    $sql = "INSERT INTO session VALUES (?, ?, ?, ?)";
    $stmt = $conn->prepare($sql);
    $stmt->bind_param("ssss", $apikey, $email, $now, $format);
    $stmt->execute();
   }
  }
}
```

PHP XML REQUEST CODE FOR SEARCH CLIENT:

```
header("Access-Control-Allow-Origin: *");
$title=null;
$author=null;
$publicationyear=null;
$category=null;
$format=null;
$apikey=null;
$now =new DateTime();
$now = $now->format('Y-m-d H:i:s');
if(!empty($_GET['format'])){
  $format=$_GET['format'];
}
if(!empty($_GET['apikey'])){
  $apikey=$_GET['apikey'];
}
if(!empty($_GET['title'])){
  $title=$_GET['title'];
}
if(!empty($_GET['author'])){
  $author=$_GET['author'];
}
if(!empty($_GET['publicationyear'])){
  $publicationyear=$_GET['publicationyear'];
}
if(!empty($_GET['category'])){
  $category=$_GET['category'];
}
$sql = "SELECT * FROM admin WHERE apikey='$apikey'";
$usage="";
$usagetime="";
$approved="";
$email="";
```

```
$result = $conn->query($sql);
if ($result->num_rows > 0) {
while ($row = $result->fetch_assoc()) {
$usage=$row["usage1"];
$usagetime=$row["timeoffirstusage"];
$approved=$row["approved"];
$email=$row["email"];
}
}

if ($approved==0){
echo "Not yet approved";
}
if ($usage>50 && $approved=="1"){

$time_str = $usagetime;
$given_time = new DateTime($time_str);
$current_time = new DateTime();
$interval_seconds = $current_time->getTimestamp() - $given_time->getTimestamp();
$twenty_four_hours_in_seconds = 24 * 60 * 60;
if (($interval_seconds) >= $twenty_four_hours_in_seconds) {
  $sql = "UPDATE ADMIN SET timeoffirstusage='0', usage1=0 WHERE apikey='$apikey'";
  $conn->query($sql);
}else{
echo "limit reach";
}
}
if ($usage<51 && $approved=="1"){
if ($usage==0){
$sql = "UPDATE ADMIN SET timeoffirstusage='$now', usage1=1 WHERE apikey='$apikey'";
$conn->query($sql);
if ($format=="XML"){
if($title!=""&&$author==""&&$publicationyear==""&&$category==""){
```

```
  $sql = "SELECT * FROM books WHERE title='$title'";
  $result = $conn->query($sql);
  $xml = new DOMDocument('1.0', 'utf-8');
  $xml->formatOutput = true;

  // Create the root element
  $root = $xml->createElement('data');
  $xml->appendChild($root);

  // Fetch and convert results to XML elements
  if ($result->num_rows > 0) {
     while ($row = $result->fetch_assoc()) {
        $entry = $xml->createElement('entry');
        foreach ($row as $key => $value) {
           $field = $xml->createElement($key, $value);
           $entry->appendChild($field);
        }
        $root->appendChild($entry);
     }
  }

  // Output the XML content
  header('Content-type: text/xml');
  echo $xml->saveXML();
}
if($title==""&&$author!=""&&$publicationyear==""&&$category==""){
  $sql = "SELECT * FROM books WHERE author='$author'";
  $result = $conn->query($sql);
  $xml = new DOMDocument('1.0', 'utf-8');
  $xml->formatOutput = true;

  // Create the root element
  $root = $xml->createElement('data');
```

```
    $xml->appendChild($root);

    // Fetch and convert results to XML elements
    if ($result->num_rows > 0) {
        while ($row = $result->fetch_assoc()) {
            $entry = $xml->createElement('entry');
            foreach ($row as $key => $value) {
                $field = $xml->createElement($key, $value);
                $entry->appendChild($field);
            }
            $root->appendChild($entry);
        }
    }

    // Output the XML content
    header('Content-type: text/xml');
    echo $xml->saveXML();
}
if($title==""&&$author==""&&$publicationyear!=""&&$category==""){
    $sql = "SELECT * FROM books WHERE publicationyear='$publicationyear'";
    $result = $conn->query($sql);
    $xml = new DOMDocument('1.0', 'utf-8');
    $xml->formatOutput = true;

    // Create the root element
    $root = $xml->createElement('data');
    $xml->appendChild($root);

    // Fetch and convert results to XML elements
    if ($result->num_rows > 0) {
        while ($row = $result->fetch_assoc()) {
            $entry = $xml->createElement('entry');
            foreach ($row as $key => $value) {
```

```
            $field = $xml->createElement($key, $value);
            $entry->appendChild($field);
        }
        $root->appendChild($entry);
    }
  }

  // Output the XML content
  header('Content-type: text/xml');
  echo $xml->saveXML();
}
if($title==""&&$author==""&&$publicationyear==""&&$category!=""){
  $sql = "SELECT * FROM books WHERE category='$category'";
  $result = $conn->query($sql);
  $xml = new DOMDocument('1.0', 'utf-8');
  $xml->formatOutput = true;

  // Create the root element
  $root = $xml->createElement('data');
  $xml->appendChild($root);

  // Fetch and convert results to XML elements
  if ($result->num_rows > 0) {
    while ($row = $result->fetch_assoc()) {
      $entry = $xml->createElement('entry');
      foreach ($row as $key => $value) {
        $field = $xml->createElement($key, $value);
        $entry->appendChild($field);
      }
      $root->appendChild($entry);
    }
  }
```

```
  // Output the XML content
  header('Content-type: text/xml');
  echo $xml->saveXML();

}
if($title==""&&$author!=""&&$publicationyear==""&&$category!=""){
  $sql = "SELECT * FROM books WHERE author='$author' AND category='$category'";
  $result = $conn->query($sql);
  $xml = new DOMDocument('1.0', 'utf-8');
  $xml->formatOutput = true;

  // Create the root element
  $root = $xml->createElement('data');
  $xml->appendChild($root);

  // Fetch and convert results to XML elements
  if ($result->num_rows > 0) {
    while ($row = $result->fetch_assoc()) {
      $entry = $xml->createElement('entry');
      foreach ($row as $key => $value) {
        $field = $xml->createElement($key, $value);
        $entry->appendChild($field);
      }
      $root->appendChild($entry);
    }
  }

  // Output the XML content
  header('Content-type: text/xml');
  echo $xml->saveXML();
}
if($title==""&&$author!=""&&$publicationyear!=""&&$category==""){
  $sql = "SELECT * FROM books WHERE author='$author' AND category='$category'";
```

```
 $result = $conn->query($sql);
 $xml = new DOMDocument('1.0', 'utf-8');
 $xml->formatOutput = true;

 // Create the root element
 $root = $xml->createElement('data');
 $xml->appendChild($root);

 // Fetch and convert results to XML elements
 if ($result->num_rows > 0) {
    while ($row = $result->fetch_assoc()) {
       $entry = $xml->createElement('entry');
       foreach ($row as $key => $value) {
          $field = $xml->createElement($key, $value);
          $entry->appendChild($field);
       }
       $root->appendChild($entry);
    }
 }

 // Output the XML content
 header('Content-type: text/xml');
 echo $xml->saveXML();
}
$sql = "INSERT INTO session VALUES (?, ?, ?, ?)";
$stmt = $conn->prepare($sql);
$stmt->bind_param("ssss", $apikey, $email, $now, $format);
$stmt->execute();
}

}else{
$usage = $usage + 1;
$sql = "UPDATE ADMIN SET usage1=$usage WHERE apikey='$apikey'";
```

```
$conn->query($sql);
if ($format=="XML"){
if($title!=""&&$author==""&&$publicationyear==""&&$category==""){
 $sql = "SELECT * FROM books WHERE title='$title'";
 $result = $conn->query($sql);
 $xml = new DOMDocument('1.0', 'utf-8');
 $xml->formatOutput = true;

 // Create the root element
 $root = $xml->createElement('data');
 $xml->appendChild($root);

 // Fetch and convert results to XML elements
 if ($result->num_rows > 0) {
    while ($row = $result->fetch_assoc()) {
       $entry = $xml->createElement('entry');
       foreach ($row as $key => $value) {
          $field = $xml->createElement($key, $value);
          $entry->appendChild($field);
       }
       $root->appendChild($entry);
    }
 }

 // Output the XML content
 header('Content-type: text/xml');
 echo $xml->saveXML();

}
if($title==""&&$author!=""&&$publicationyear==""&&$category==""){
 $sql = "SELECT * FROM books WHERE author='$author'";
 $result = $conn->query($sql);
 $xml = new DOMDocument('1.0', 'utf-8');
```

```
  $xml->formatOutput = true;

  // Create the root element
  $root = $xml->createElement('data');
  $xml->appendChild($root);

  // Fetch and convert results to XML elements
  if ($result->num_rows > 0) {
     while ($row = $result->fetch_assoc()) {
        $entry = $xml->createElement('entry');
        foreach ($row as $key => $value) {
           $field = $xml->createElement($key, $value);
           $entry->appendChild($field);
        }
        $root->appendChild($entry);
     }
  }

  // Output the XML content
  header('Content-type: text/xml');
  echo $xml->saveXML();
}
if($title==""&&$author==""&&$publicationyear!=""&&$category==""){
  $sql = "SELECT * FROM books WHERE publicationyear='$publicationyear'";
  $result = $conn->query($sql);
  $xml = new DOMDocument('1.0', 'utf-8');
  $xml->formatOutput = true;

  // Create the root element
  $root = $xml->createElement('data');
  $xml->appendChild($root);

  // Fetch and convert results to XML elements
```

```
  if ($result->num_rows > 0) {
    while ($row = $result->fetch_assoc()) {
      $entry = $xml->createElement('entry');
      foreach ($row as $key => $value) {
        $field = $xml->createElement($key, $value);
        $entry->appendChild($field);
      }
      $root->appendChild($entry);
    }
  }

  // Output the XML content
  header('Content-type: text/xml');
  echo $xml->saveXML();
}
if($title==""&&$author==""&&$publicationyear==""&&$category!=""){
  $sql = "SELECT * FROM books WHERE category='$category'";
  $result = $conn->query($sql);
  $xml = new DOMDocument('1.0', 'utf-8');
  $xml->formatOutput = true;

  // Create the root element
  $root = $xml->createElement('data');
  $xml->appendChild($root);

  // Fetch and convert results to XML elements
  if ($result->num_rows > 0) {
    while ($row = $result->fetch_assoc()) {
      $entry = $xml->createElement('entry');
      foreach ($row as $key => $value) {
        $field = $xml->createElement($key, $value);
        $entry->appendChild($field);
      }
```

```
        $root->appendChild($entry);
      }
    }

    // Output the XML content
    header('Content-type: text/xml');
    echo $xml->saveXML();
  }
  if($title==""&&$author!=""&&$publicationyear==""&&$category!=""){
    $sql = "SELECT * FROM books WHERE author='$author' AND category='$category'";
    $result = $conn->query($sql);
    $xml = new DOMDocument('1.0', 'utf-8');
    $xml->formatOutput = true;

    // Create the root element
    $root = $xml->createElement('data');
    $xml->appendChild($root);

    // Fetch and convert results to XML elements
    if ($result->num_rows > 0) {
      while ($row = $result->fetch_assoc()) {
        $entry = $xml->createElement('entry');
        foreach ($row as $key => $value) {
          $field = $xml->createElement($key, $value);
          $entry->appendChild($field);
        }
        $root->appendChild($entry);
      }
    }

    // Output the XML content
    header('Content-type: text/xml');
    echo $xml->saveXML();
```

```
}
if($title==""&&$author!=""&&$publicationyear!=""&&$category==""){
 $sql = "SELECT * FROM books WHERE author='$author' AND category='$category'";
 $result = $conn->query($sql);
 $xml = new DOMDocument('1.0', 'utf-8');
 $xml->formatOutput = true;

 // Create the root element
 $root = $xml->createElement('data');
 $xml->appendChild($root);

 // Fetch and convert results to XML elements
 if ($result->num_rows > 0) {
    while ($row = $result->fetch_assoc()) {
       $entry = $xml->createElement('entry');
       foreach ($row as $key => $value) {
          $field = $xml->createElement($key, $value);
          $entry->appendChild($field);
       }
       $root->appendChild($entry);
    }
 }

 // Output the XML content
 header('Content-type: text/xml');
 echo $xml->saveXML();
}
$sql = "INSERT INTO session VALUES (?, ?, ?, ?)";
$stmt = $conn->prepare($sql);
$stmt->bind_param("ssss", $apikey, $email, $now, $format);
$stmt->execute();
}
}
```

```
}
```

PHP CODE FOR ATTRIBUTION OF API KEY FOR EACH REGISTRATION

```
<?php

// Initialize variables

$email = null;

$password = null;


// Check for values in the POST parameters and assign them to variables

if (!empty($_POST['email'])) {

   $email = $_POST['email'];

}

if (!empty($_POST['password'])) {

   $password = $_POST['password'];

}


// Function to generate a random API key

function generateApiKey($length = 30) {

   $characters = '0123456789abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ';

   $apiKey = '';


   for ($i = 0; $i < $length; $i++) {

      $apiKey .= $characters[rand(0, strlen($characters) - 1)];

   }


   return $apiKey;

}


// Generate an API key
```

```
$apiKey = generateApiKey();

// Query to check if the email already exists in the admin table
$query = "SELECT * FROM admin WHERE email='$email'";
$result = $conn->query($query);

// Check if the query was successful
if ($result) {
   // Check if the email already exists in the table
   if (mysqli_num_rows($result) > 0) {
      echo '<script>alert("Account exists already")</script>';
      header('Location: login.html?exist=yes');
   } else {
      // Insert a new admin account into the table
      $sql = "INSERT INTO admin VALUES('$email','$password','$apiKey',0,0,'0')";
      if ($conn->query($sql) === TRUE) {
         echo '<script>alert("Account created successfully")</script>';
         header('Location: login.html?exist=no');
      } else {
         // Handle any errors that occur during insertion
         // ... (error handling code)
      }
   }
} else {
   // Output an error message if the query fails
   echo 'Error: ' . mysqli_error();
}

// Close the database connection
```

```
$conn->close();
?>
```

PHP CODE FOR APPROVAL:

```
<?php
// Initialize variables
$operation = null;

// Check if 'operation' is present in GET parameters and assign its value to the variable
if (!empty($_GET['operation'])) {
    $operation = $_GET['operation'];
}

// Initialize another variable
$apikey = null;

// Check if 'apikey' is present in GET parameters and assign its value to the variable
if (!empty($_GET['apikey'])) {
    $apikey = $_GET['apikey'];
}

// Check if the operation is to 'view'
if ($operation == "view") {
    // Query to retrieve admin records with 'approved' status as 0
    $sql = "SELECT * FROM admin WHERE approved=0";
    $result = $conn->query($sql);

    // Create an array to hold the fetched data
    $emparray = array();
```

```
    // Fetch data and store it in the array
    while ($row = mysqli_fetch_assoc($result)) {
        $emparray[] = $row;
    }

    // Convert the array to JSON format and output
    echo json_encode($emparray);
}

// Check if the operation is to 'approve'
if ($operation == "approve") {
    // SQL query to update the 'approved' status of an admin with the given API key
    $sql = "UPDATE admin SET approved=TRUE WHERE apikey='$apikey'";

    // Attempt to execute the SQL query
    if ($conn->query($sql) === TRUE) {
        echo "approved"; // Output a success message
    } else {
        // Handle any errors that occur during the query execution
        // ... (error handling code)
    }
}
?>
```