

Report of My First PHP Website

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1 Problem Description

1.1 Exercise 1

Implement home.php with a text input box and a search button, which sends the input content to result.php using a GET request on the click.

1.2 Exercise 2

Implement result.php, which displays the first 10 matching scholars in descending order of the number of papers. The main affiliation of each scholar and the hyperlink to the scholar's page should also be displayed.

1.3 Exercise 3

Implement author.php, which displays the 10 most cited papers of the author. For every paper, its venue and authors in sequence should also be displayed. Like Exercise 1, the hyperlink to the author's page is needed.

1.4 Exercise 4

Add the function of autocomplete to the text input box of home.php and implement hint.php, which receives the real-time input from home.php and returns hints for autocomplete.

1.5 Exercise 5 (Optional)

Migrate all the PHP code above to the framework CodeIgniter and do proper MVC separation.

2 Problem Analysis

2.1 Skills Involved

These exercises mainly involve the knowledge of PHP and SQL for the backend. Besides, some basic understanding of HTML and CSS would help do the part of display.

As for the optional exercise, the skills of developing with the framework CodeIgniter are also required.

2.2 Solution Design

Considering the huge difference of two solutions (Raw PHP and CodeIgniter), solution design will be stated separately in the following two sections.

3 Solution One : Raw PHP

3.1 home.php

3.1.1 Form

Just with some basic knowledge of HTML, the form can be easily implemented. The code for the form is as follows:

```
1 <form action="result.php" method="get">
2   <input type="text" id="authorname" name="authorname">
3   <input type="submit" id="homeSubmit" value="Search">
4 </form>
```

3.1.2 Autocomplete

According to the instructions, the Autocomplete widget of jQuery can be applied for this task. But as the given tutorial is nearly 7 years ago, it's been outdated and can't work properly.

Therefore, I switch to the latest version of JQuery UI and use a slightly different method. Instead of downloading the JQuery UI files, I just link to its CDN.

The code for autocomplete is as follows:

```
1 <link rel="stylesheet" href =  
  ↪ "https://code.jquery.com/ui/1.12.1/themes/base/jquery-ui.css" >  
2 <script src="https://code.jquery.com/jquery-1.12.4.js"> </script>  
3 <script src="https://code.jquery.com/ui/1.12.1/jquery-ui.js"> </script>  
4 <script type="text/javascript">  
5     $(function(){  
6         $('#authorname' ).autocomplete({  
7             source: "hint.php",  
8             minLength: 1,  
9         });  
10    });  
11 </script>
```

3.2 connect.php

As in different PHP files, connection to the database is frequently needed, it's better to write it in a single PHP file connect.php to simplify other files.

There're several ways for PHP applications to connect to MySQL database, and I choose to use MySQLi, which is object-oriented. The code is like these:

```
1 <?php  
2 $servername="..."; //omitted  
3 $username="...";  
4 $password="...";  
5 $database="...";  
6 $conn=new mysqli($servername,$username,$password,$database);  
7 if($conn->connect_error){  
8     die("Failed to connect to the database:".$conn->connect_error);  
9 }  
10 ?>
```

3.3 hint.php

3.3.1 SQL Query

As required, hint.php receives the parameter term and searches in the database for matching authors. So it needs to connect to the database and execute SQL queries to get the search result.

The SQL query is designed like this:

```
1 SELECT authors.*,paper_author_affiliation.num  
2 FROM authors,  
3     (SELECT authorid,count(1) AS num FROM paper_author_affiliation GROUP BY  
  ↪ authorid)paper_author_affiliation  
4 WHERE authors.authorid=paper_author_affiliation.authorid AND authors.authorname LIKE  
  ↪ '%$authorname%'  
5 ORDER BY num DESC  
6 LIMIT 10;
```

And the complete code will be shown at the end of this section.

3.3.2 Json

The Autocomplete widget of jQuery UI works in a way that requires hint.php to return Json encoded information, so the final step of hint.php is to encode the result into Json code.

With the help of the built-in function `json_encode()`, things are relatively easy.

```
1 echo json_encode($resultArray);
```

3.3.3 The Complete Code

Things to note are that we include connect.php to do the job of connecting to the database with MySQLi and that `filter_input()` function makes sure that there's no illegal character in authorname to avoid potential security risks.

```
1 <?php
2     if(filter_has_var(INPUT_GET, "term")){
3         include_once("connect.php");
4         $authorname=filter_input(INPUT_GET, "term",FILTER_SANITIZE_MAGIC_QUOTES);
5         $authorname=strtolower($authorname);
6         $query="..."; //omitted as it has been shown before
7         $queryResult=$conn->query($query);
8         while($row = $queryResult->fetch_assoc()) {
9             $resultArray[] = array('id' =>
10                 ↪ $row["AuthorID"], 'label'=>$row["AuthorName"] );
11         }
12     }
13     echo json_encode($resultArray);
14 }
```

3.4 result.php

3.4.1 SQL Query

In result.php, given the author's name, we do the fuzzy search to get the 10 most cited authors and their main affiliation.

Maybe things can be done in a single SQL query, but for simplicity and clearness, I choose to divide the query into two steps:

First, get the 10 most cited authors. The SQL query is like this:

```
1 SELECT authors.*,paper_author_affiliation.num
2 FROM authors,
3     (SELECT authorid,count(1) AS num FROM paper_author_affiliation GROUP BY
4     ↪ authorid)paper_author_affiliation
5 WHERE authors.authorid=paper_author_affiliation.authorid AND authors.authorname LIKE
6     ↪ '%$authorname%'
7 ORDER BY num DESC
8 LIMIT 10;
```

Second, for each author, get his/her main affiliation. The SQL query is like this:

```
1 SELECT affiliations.*
2 FROM affiliations,
3     (SELECT affiliationid,count(1)
4     ↪ FROM paper_author_affiliation
5     ↪ WHERE authorid='$authorID'
6     ↪ GROUP BY affiliationid
7     ↪ ORDER BY count(1) DESC)paper_author_affiliation
```

```

8 WHERE affiliations.affiliationid = paper_author_affiliation.affiliationid
9 LIMIT 1;

```

3.4.2 Display

Considering the structure of data, using table is a simple way to present the result. The code for the table is like these:

```

1 <table id='searchResult' align='center'>
2   <tr>
3     <th>Author Name</th>
4     <th id="widenColumn">Total Citations</th>
5     <th>Affiliation Name</th>
6   </tr>
7   <tr>
8     <td ><a href='/author.php?authorid=77487C6A'>Johannes Asfalg</a></td>
9     <td id='widenColumn'>1</td>
10    <td >
11      <ul><li>
12        <a href='/affiliation.php?affiliationid=007D2F41' >
13          Ludwig Maximilian University Of Munich
14        </a>
15      </li></ul>
16    </td>
17  </tr>
18 </table>

```

And if the authorname is not given or there's no result found, it shows an error page, of which the code is like these:

```

1 <?php
2 if(isset($_GET['authorname']))){
3   //omitted
4 }else{
5   echo "<div id='noResult'>Invalid Author Name!</div>";
6 }
7 ?>

```

Note that in the above two code snippets, I use some CSS ID selectors defined in the file css/main.css, which will be further explained in the last subsection of this section.

3.5 author.php

3.5.1 SQL Query

For author.php, the SQL query is more complicated, so still, dividing the query into some steps is a good idea.

First, we check whether the authorid exists:

```

1 <?php
2 $queryForExistence="SELECT count(1) as num FROM paper_author_affiliation WHERE
3   ↳ authorID = '$authorID'";
4 $queryResultForExistence=$conn->query($queryForExistence);
5 $row=$queryResultForExistence->fetch_assoc();
6 if($row["num"]==0)
7   echo "<div id='noResult'>No Paper Founded!</div>";
8 ?>

```

Second, Having confirmed the existence, we query for author's name:

```
1 <?php
2 $queryForName="SELECT AuthorName From authors where AuthorID='$authorID'";
3 $queryResultForName=$conn->query($queryForName);
4 $authorName=($queryResultForName->fetch_assoc())["AuthorName"];
5 ?>
```

Third, query for the 10 most cited papers of the author:

```
1 <?php
2 $queryForPaper="
3 SELECT papers.*,conferences.ConferenceName,paper_reference.citation
4 FROM papers,conferences,paper_author_affiliation,
5      (SELECT referenceid,count(1) AS citation FROM paper_reference
6       ↪ GROU)paper_reference
7 WHERE papers.paperid = paper_reference.referenceid
8       AND conferences.conferenceid = papers.conferenceid
9       AND papers.paperid = paper_author_affiliation.paperid
10      AND paper_author_affiliation.authorid = '$authorID'
11 ORDER BY citation DESC
12 LIMIT 10;";
13 $paperCnt=0;
14 $queryResultForPaper=$conn->query($queryForPaper);
15 while($row=$queryResultForPaper->fetch_assoc()){
16     $paperCnt++;
17     handleOnePaper($row,$conn);
18 }
```

Fourth, for every paper, query for its authors, which is a part of the function handleOnePaper():

```
1 SELECT authors.AuthorName,paper_author_affiliation.*
2 FROM authors, ( SELECT * FROM paper_author_affiliation WHERE
3 ↪ paperid='$paperID'paper_author_affiliation
4 WHERE paper_author_affiliation.authorid=authors.authorid
5 ORDER BY paper_author_affiliation.authorsequence ASC;
```

Lastly, note that in the above procedures every paper we get is cited at least once, that's to say, we leave behind the papers with no citation. This could cause problems if the author has less than 10 cited papers.

So, an additional query is needed if in the third step we get less than 10 papers:

```
1 <?php
2 if($paperCnt<10){
3     $extraNum=10-$paperCnt;
4     $queryForExtraPaper="
5     SELECT papers.*,conferences.ConferenceName
6     FROM papers,conferences,paper_author_affiliation
7     WHERE papers.paperid=paper_author_affiliation.paperid
8           AND paper_author_affiliation.authorid='$authorID'
9           AND (Select count(1) FROM paper_reference WHERE paper_reference.referenceid =
10 ↪ papers.paperid) = 0
11           AND papers.conferenceid=conferences.conferenceid
12 LIMIT $extraNum;";
13 $queryResultForExtra=$conn->query($queryForExtraPaper);
14 while($row=$queryResultForExtra->fetch_assoc()){
15     $paperCnt++;
16     handleOnePaper($row,$conn,$noCitation=true);
17 }
```

```

16 }
17 ?>

```

3.5.2 Display

The same as the display of the search result, I choose to use a table to present the papers and use a ordered list for authors.

```

1 <table id='papers' align='center'>
2   <tr>
3     <th id="narrowedColumn">Paper Title</th>
4     <th>Publish Year</th>
5     <th>Conference</th>
6     <th>Citations</th>
7     <th style="text-align:center">Author(s)</th>
8   </tr>
9
10  <tr>
11    <td id = "narrowedColumn"> Querying Inconsistent Description Logic Knowledge
12    ↪ Bases Under Preferred Repair Semantics </td>
13    <td>2014</td>
14    <td>AAAI</td>
15    <td>1</td>
16    <td>
17      <ol>
18        <li>
19          <a href="/author/7F4D1062">Meghyn Bienvenu</a>
20        </li>
21        <li>
22          <a href="/author/7DA12C4C">Camille Bourgaux</a>
23        </li>
24        <li>
25          <a href="/author/01E80BB2">Francois Goasdoue</a>
26        </li>
27      </ol>
28    </td>
29  </tr>
30 </table>

```

For the sake of beauty and completeness, I also add the image and description of the author.

```

1 
2 <div id="profile">
3   <p>
4     This is the description. This is the description.This is the description.
5     This is the description. This is the description. This is the description.
6     This is the description. This is the description.
7   </p>
8   <p>
9     This is the description. This is the description.This is the description.
10    This is the description. This is the description. This is the description.
11    This is the description. This is the description.
12  </p>
13 </div>

```


3.6 main.css

As we need to customize the appearance of pages, using a CSS file saves unnecessary code and is easy to modify and migrate to other solutions. For example, the style for empty result and hyperlinks are like these:

```
1 #noResult{
2     font-size:30px;
3     color: gray;
4     margin-top: 50px;
5     position: absolute;
6     left: 50%;
7     transform: translate(-50%,0);
8 }
9 a:link {
10     text-decoration: none;
11 }
12 a:visited {
13     text-decoration: none;
14 }
15 a:hover {
16     text-decoration: none;
17 }
18 a:active {
19     text-decoration: none;
20 }
```

4 Solution Two : CodeIgniter

4.1 Overall Design And Config

As I have solved all the problems with Solution One already, many things can be reused. For instance, the CSS file, SQL queries, and HTML code just need to be modified rather than rewrote.

With these, I just need to consider how to separate this PHP application into Model, View and Controller properly, which will be covered in the following subsections.

To get the framework CodeIgniter to work, the first thing is to configure it properly. Files in application/config such as config.php and database.php need to be modified.

4.2 Model

4.2.1 Search Result Model

Considering the similarity of SQL queries between hint.php and result.php of Solution One, they can be integrated into one model extending from CI_Model, Search_result_model in application/models/Search_result_model.php.

On construction, it loads the database.

```
1 <?php
2 public function __construct()
3 {
4     $this->load->database();
5 }
6 ?>
```

Then it has two public functions for hint and search result respectively: get_hint() and get_search_result(), in which the SQL queries are similar to those of Solution One and omitted in the following code.

```

1  <?php
2  public function get_hint($authorname=NULL)
3  {
4      $query=$this->db->query("..."); //omitted here
5      return $query->result_array();
6
7  }
8  public function get_search_result($authorname="", $begin=0, $end=10)
9  {
10     $queryForAuthor=$this->db->query("..."); //omitted here
11     if(!$queryForAuthor->result_array())
12         return NULL;
13     else{
14         $result=array();
15         foreach($queryForAuthor->result_array() as $row){
16             $singleAuthor["authorID"]=$row["AuthorID"];
17             $singleAuthor["authorName"]=$row["AuthorName"];
18             $singleAuthor["paperNum"]=$row["num"];
19             $queryForAffiliation=$this->db->query("..."); //omitted here
20             $rowAff=$queryForAffiliation->row_array();
21             $singleAuthor["affiliationID"]=$rowAff["AffiliationID"];
22             $singleAuthor["affiliationName"]=$rowAff["AffiliationName"];
23             array_push($result, $singleAuthor);
24         }
25         return $result;
26     }
27 }
?>

```

4.2.2 Author Info Model

This model is specifically designed for getting an author's information like name, image, description and papers.

Its main member function is `get_author_info()`, which takes an author ID and returns all the information about the author. Again, as the SQL queries are similar to previous ones in Solution One, they are omitted in the code.

```

1  <?php
2  public function get_author_info($authorID=NULL, $maxPaperNum=10)
3  {
4      $queryForExistence=$this->db->query("..."); //omitted here
5      if($queryForExistence->row_array()["num"]==0)
6          return NULL;
7      $result=array();
8      $queryForName=$this->db->query("..."); //omitted here
9      $result["authorName"]=( $queryForName->row_array() )["AuthorName"];
10     $result["authorDescription"]="...";
11     $result["authorImg"]="...";
12     $queryForPaper=$this->db->query("..."); //omitted here
13     $paperCnt=0;
14     $papers=array();
15     foreach ($queryForPaper->result_array() as $row) {
16         $paperCnt+=1;
17         array_push($papers, $this->handle_one_paper($row));
18     }
19     if($paperCnt<10){
20         $extraNum=10-$paperCnt;

```

```

21         $queryForExtraPaper=$this->db->query("..."); //omitted here
22         foreach ($queryForExtraPaper->result_array() as $row) {
23             $paperCnt+=1;
24             $row["citation"]=0;
25             array_push($papers, $this->handle_one_paper($row));
26         }
27     }
28     $result["papers"]=$papers;
29     return $result;
30 }
31 ?>

```

Two auxiliary functions are also defined for convenience: `handle_one_paper()` (as you see in the above code) and `get_paper_author()`.

Note that `handle_one_paper()` is private as it has no value for outside callers and `get_paper_author()` is public as it has the potential to be reused.

```

1  <?php
2  private function handle_one_paper($row)
3  {
4      $temp["paperID"]=$row["PaperID"];
5      $temp["paperTitle"]=$row["Title"];
6      $temp["paperPublishYear"]=$row["PaperPublishYear"];
7      $temp["conferenceID"]=$row["ConferenceID"];
8      $temp["conferenceName"]=$row["ConferenceName"];
9      $temp["citation"]=$row["citation"] ?? 0;
10     $temp["authors"]=$this->get_paper_author($row["PaperID"]);
11     return $temp;
12 }
13
14 public function get_paper_author($paperID=NULL)
15 {
16     $queryForAuthors=$this->db->query(".."); //omitted here
17     $authors=array();
18     foreach ( $queryForAuthors->result_array() as $subAuthor) {
19         $temp["subAuthorName"]=$subAuthor["AuthorName"];
20         $temp["subAuthorID"]=$subAuthor["AuthorID"];
21         $temp["subAuthorSequence"]=$subAuthor["AuthorSequence"];
22         array_push($authors, $temp);
23     }
24     return $authors;
25 }
26 ?>

```

4.3 View

4.3.1 Header, Footer and Error Template

As all HTML pages contain some common code, putting it in templates is a feasible idea. So the header, footer and error page can be put in the folder `application/views/templates`. For example, `header.php` is as follows:

```

1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4      <meta charset="UTF-8">
5      <title><?php echo $title; ?></title>

```

```

6      <link rel="stylesheet" href="/static/css/main.css">
7  </head>
8  <body>
9      <h1><?php echo $title; ?></h1>

```

4.3.2 Home Page

Considering the uniqueness of home page, it's hard for it to use the previous header and footer. So I just create a template for it, home.php.

```

1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4      <meta charset="UTF-8">
5      <title>Home</title>
6      <link rel="stylesheet" href="/static/css/main.css">
7      <link rel="stylesheet"
8      ↪ href="https://code.jquery.com/ui/1.12.1/themes/base/jquery-ui.css">
9      <script src="https://code.jquery.com/jquery-1.12.4.js"></script>
10     <script src="https://code.jquery.com/ui/1.12.1/jquery-ui.js"></script>
11     <script type="text/javascript">
12         $(function(){
13             $('#authorname').autocomplete({
14                 source: "hint.php",
15                 minLength: 1,
16             });
17         });
18     </script>
19 </head>
20 <body>
21     <div id="superCenter">
22         <h1>Home</h1>
23
24     <div id="homepage" align="center">
25         <?php echo form_open('/'); ?>
26         <input type="text" id="authorname" name="authorname">
27         <input type="submit" id="homeSubmit" value="Search">
28     </form>
29 </div>
30 </div>
31 </body>
32 </html>

```

Note that Line 23 of the code snippet is a little unusual, which will be explained in the subsection Controller.

4.3.3 Search Result Page

Search result page takes data from the controller and presents them in HTML. As CodeIgniter allows the template file to be a mixture of HTML and PHP, it looks like these:

```

1  <?php
2  function
3  ↪ echoAuthor($authorID,$authorName,$paperNum,$affiliationID,$affiliationName)
4  {
5      $affiliationName=$affiliationName ?ucwords($affiliationName): "None";

```

```

5      $affiliationID=$affiliationID??"00000000";
6      $authorName=ucwords($authorName);
7      echo "
8      <tr>
9          <td><a href='/author/$authorID'$>$authorName</a></td>
10         <td id='widenColumn'$>$paperNum</td>
11         <td><ul><li><a
12     ↪ href='/affiliation/$affiliationID'$>$affiliationName</a></li></ul></td>
13     </tr>\n";
14     }
15     <table id='searchResult' align='center'>
16         <tr>
17             <th>Author Name</th>
18             <th id="widenColumn">Total Citations</th>
19             <th>Affiliation Name</th>
20         </tr>
21         <?php
22         foreach ($searchResult as $singleAuthor) {
23             echoAuthor($singleAuthor["authorID"], $singleAuthor["authorName"],
24             ↪ $singleAuthor["paperNum"], $singleAuthor["affiliationID"],
25             ↪ $singleAuthor["affiliationName"]);
26         }
27     <?>
28 </table>

```

4.3.4 Author Page

Similar to the search result page, the template file looks like these:

```

1 
2 <div id="profile">
3     <?php echo $author_info["authorDescription"]; ?>
4 </div>
5 <?php
6     if(!$author_info["papers"]){
7         echo "<div id='noResult'>No Paper Founded!</div>";
8         exit();
9     }
10 <?>
11 <table id='papers' align='center'>
12     <tr>
13         <th id="narrowedColumn">Paper Title</th>
14         <th>Publish Year</th>
15         <th>Conference</th>
16         <th>Citations</th>
17         <th style="text-align:center">Author(s)</th>
18     </tr>
19     <?php
20     foreach ($author_info["papers"] as $paper) {
21         echo '
22         <tr>
23             <td id="narrowedColumn">'.ucwords($paper["paperTitle"]).'</td>
24             <td>'. $paper["paperPublishYear"].'</td>
25             <td>'. $paper["conferenceName"].'</td>
26             <td>'. $paper["citation"].'</td>

```

```

27         <td>
28             <ol>';
29             foreach($paper["authors"] as $subAuthor){
30                 echo '
31                     <li>
32                         <a href= "/author/'. $subAuthor["subAuthorID"] .' ">'.ucwords(
↪ $subAuthor["subAuthorName"] ).'</a>
33                     </li>';
34             }
35             echo '
36                 </ol>
37             </td>';
38         }
39     ?>
40 </table>

```

4.4 Controller

As this application is quite light, I only define a controller Page extending from CI_Controller with several methods as follows.

4.4.1 index()

This method is for the home page, in which there's a form for input. To implement the form, it needs to load the form helper and form_validation. Also, as mentioned in the subsection View, the view of home page needs to create the form in this way:

```

1 <?php echo form_open('/'); ?>

```

If the data in the form pass the validation, then it redirects to the result page. Otherwise, just stay in the home page. So the code snippet is like these:

```

1 <?php
2 public function index()
3 {
4     $this->load->helper('form');
5     $this->load->library('form_validation');
6     $this->form_validation->set_rules('authorname', 'Author Name', 'required');
7     if ($this->form_validation->run() === FALSE){
8         $this->load->view('templates/home.php');
9     }
10    else{
11        $authorName=$this->input->post("authorname");
12        redirect("/result/$authorName");
13    }
14 }
15 ?>

```

4.4.2 result()

This method is for the search result page. It first checks whether the parameter authorname is set and if not, loads the error page. Else, it gets the search result from Search_result_model() and transfers the data to the view, result.php.

```

1 <?php
2 public function result($authorname=NULL)

```


4.5 Route

The URL pattern looks like `http://example.com/index.php/page/author/00000000`, which is a little too complicated. To simplify the URL, we need to modify `config/routes.php`.

First, to eliminate the unnecessary `"/page"`, we just set the `default_controller` as `Page` and add rules for routes like these:

```
1 <?php
2     $route['default_controller'] = 'page';
3     $route['result/(:any)'] = 'page/result/$1';
4     $route['author/(:any)'] = 'page/author/$1';
5     $route['(:any)'] = 'page/$1';
6 ?>
```

Then the URL may look like `http://example.com/index.php/author/00000000`, still having the unnecessary `"/index.php"`.

To get rid of it, we need to let Apache allow override and put the file `.htaccess` in the folder of CodeIgniter, of which the content is:

```
1 RewriteEngine On
2 RewriteCond %{REQUEST_FILENAME} !-f
3 RewriteCond %{REQUEST_FILENAME} !-d
4 RewriteRule ^(.*)$ index.php/$1 [L]
```

And in `config.php`, set

```
1 <?php
2 $config['index_page'] = '';
3 ?>
```

Having done all these, the URL finally looks like `http://example.com/author/00000000`.

Pretty!

4.6 Some Critical Issues

4.6.1 Autocomplete

What we have done in Solution One should work fine in CodeIgniter, but there's one critical problem: `/hint.php?term=something` can't be handled directly by CodeIgniter, as the standard URL pattern is `/class/method/arguments`.

To solve this, there are two possible ways:

First, configure CodeIgniter to enable query strings, which is natural but a little complex.

Second, create a PHP file `hint.php`, which redirect the request like `/hint.php?term=something` to `/hint/something`, which can be parsed.

After some struggle, I choose the latter one. The `hint.php` is quite simple:

```
1 <?php
2 header("Location: /hint/" . $_GET['term']);
3 ?>
```

Then just ordinarily, create a new method called `hint()` in the controller:

```
1 <?php
2 public function hint($term=NULL)
3 {
4     if($term){
5         $data["queryResult"]=$this->Search_result_model->get_hint($term);
6         $this->load->view("templates/hint.php",$data);
7     }
8 }
```



```

8     }
9     ?>

```

A new template hint.php in views/templates:

```

1  <?php
2  if($queryResult){
3      foreach($queryResult as $row ){
4          $resultArray[] = array('id' => $row["AuthorID"], 'label'=>$row["AuthorName"]
5          ↪ );
6      }
7      echo json_encode($resultArray);
8  }
9  ?>

```

And a new route rule in config/routes.php:

```

1  <?php
2  $route['hint/(:any)']='page/hint/$1';
3  ?>

```

Then, the Autocomplete function works perfectly.
Cheers!

4.6.2 Static Resources

When linking to CSS files and images, the relative address of files can't work correctly and then all the CSS styles and images fail.

To fix this issue, I create a folder static/ at the same level as application/, in which all the CSS files and images are put.

Then when linking to them, just write something like "/static/img/author.jpg" or "/static/css/main.css".

5 Result Display

The website looks like these:



Figure 1: Home

Home

| | |
|------------------|--------|
| ke | Search |
| takeo kanade | |
| maarten de rijke | |
| kathleen mckeown | |
| kevin knight | |
| katsushi ikeuchi | |
| kenneth d forbus | |
| steven w zucker | |
| luke zettlemoyer | |
| david c parkes | |
| kevin w bowyer | |

Figure 2: Autocomplete

Result of Ke

| Author Name | Total Citations | Affiliation Name |
|------------------|-----------------|--|
| Takeo Kanade | 155 | Kyoto University |
| Maarten De Rijke | 108 | University Of Amsterdam |
| Kathleen Mckeown | 93 | Stanford University |
| Kevin Knight | 92 | Information Sciences Institute |
| Katsushi Ikeuchi | 84 | Carnegie Mellon University |
| Kenneth D Forbus | 60 | University Of Illinois At Urbana Champaign |
| Steven W Zucker | 54 | Canadian Institute For Advanced Research |

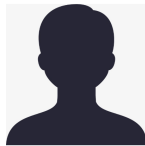
Figure 3: Search Result

Result of Nononononono

No Author Found!

Figure 4: No Result

Takeo Kanade's Page



This is the description. This is the description. This is the description. This is the description. This is the description. This is the description. This is the description. This is the description. This is the description.

This is the description. This is the description. This is the description. This is the description. This is the description. This is the description. This is the description. This is the description. This is the description.

| Paper Title | Publish Year | Conference | Citations | Author(s) |
|--|--------------|------------|-----------|---|
| An Iterative Image Registration Technique With An Application To Stereo Vision | 1981 | IJCAI | 414 | 1. Bruce D Lucas 2. Takeo Kanade |
| A Statistical Method For 3d Object Detection Applied To Faces And Cars | 2000 | CVPR | 118 | 1. Henry Schneiderman 2. Takeo Kanade |
| Neural Network Based Face Detection | 1998 | CVPR | 98 | 1. Henry A Rowley 2. Shumeet Baluja 3. Takeo Kanade |

Figure 5: Author

Error

Invalid Author ID!

Figure 6: Invalid Author

6 Conclusion And Prospect

Developing my first PHP website took me quite plenty of time and energy. It's exhausting but worthwhile.

In the process, I got a better understanding of HTML and CSS, which are the basis of frontend. Besides, I learned a new programming language, PHP, which is very useful to develop a website. As for SQL, I also gained a deeper insight into it and learned how to use it effectively.

And when doing the optional Exercise Five, I was introduced to a whole new PHP framework CodeIgniter. The difference and similarity of it and raw PHP are quite impressive.

Eventually, a relatively beautiful and well-built website was developed, much to my delight.

However, to be honest, there're still some improvements for me to make. For example, how to prevent SQL injection? How to prevent XSS and CSRF attack? How to speed up the query more efficiently?

A lot for me to explore!