

Project Report

ELECTRONIC HEALTH RECORDS

Designed for Human Computer Interaction

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Introduction:

The primary goal of my project is to develop an ELECTRONIC HEALTH RECORD APPLICATION (EHR). The primary objective of EHR is to maintain a comprehensive health record of a patient that can be maintained electronically. But apart from this, I have include some more functionalities into my project which would come in handy. Though the idea of EHR is a very vast subject, I have tried to implement major functionalities in my project at a basic level.

Functionalities:

The major functionalities that I have implemented in the EHR are:

- I. **My Health Record:** Using this module, the patient has the complete database of his health history up to date. It is a one stop for all the patient's diagnosis, prescriptions and test reports.
- II. **Book Appointment:** This module allows the patients to book appointments with the registered doctors with a single click from their home. They need not wait in long queues before the hospitals or clinics.
- III. **Find Drugs:** This maintains the comprehensive drug database. It comprises of all the important information related to the drug like drug description, uses, side effects, alternatives etc.

This project is most importantly designed for enhancing the human computer interaction (HCI) aspect. So while designing the project I have taken all of the three elements of the HCI for providing an enriching experience to the user. Let us look at these elements below.

HUMAN:

The target audience for the EHR are:

- **DOCTORS**
 1. Improved diagnosis and treatment
 2. The ability to increase the number of patients served per day because of online booking appointment.
 3. Advanced e-Prescribing and clinical documentation capabilities
- **PATIENTS**
 1. Always have their comprehensive health history at their hand
 2. The prescriptions from the doctors are no longer illegible
 3. The patients can learn about the drugs prescribed
 4. Patient can book appointment with the doctor without having to wait in long queue
- **DISPENSARIES**
 1. The person can provide alternative drug to the customer when the required drug is out of stock.
 2. The person can check if the customer has requested for the drug within its dosage limit.

The various human factors that I have taken into account for developing this project are:

- The stress and the difficulty that the doctor's confront with when dealing a case. Often the patients do not turn up with their earlier diagnoses that are very important for the doctor to find a solution.
- The test reports and the other prescriptions are often lost or misplaced and the patient finds it a difficulty to know them again.
- The written prescriptions or diagnoses are not legible or sometimes not understandable by other doctors. This would be helpful when the user travels to some other place or country.
- The dosages and the medicines vary from place to place. Also the manufacturers may change. The patients might have difficulty finding them. The find drugs tab in the website would be of great help.
- When a patient goes to the dispensary and finds that the prescribed medicine is not in stock, he can check for the alternatives in the find drugs tab and find its dosage there. So his work is simplified.
- The doctors can have all the records, lab tests, reports, medical prescriptions of a patient at one place and in a systematic manner. This greatly simplifies the work of the doctor.

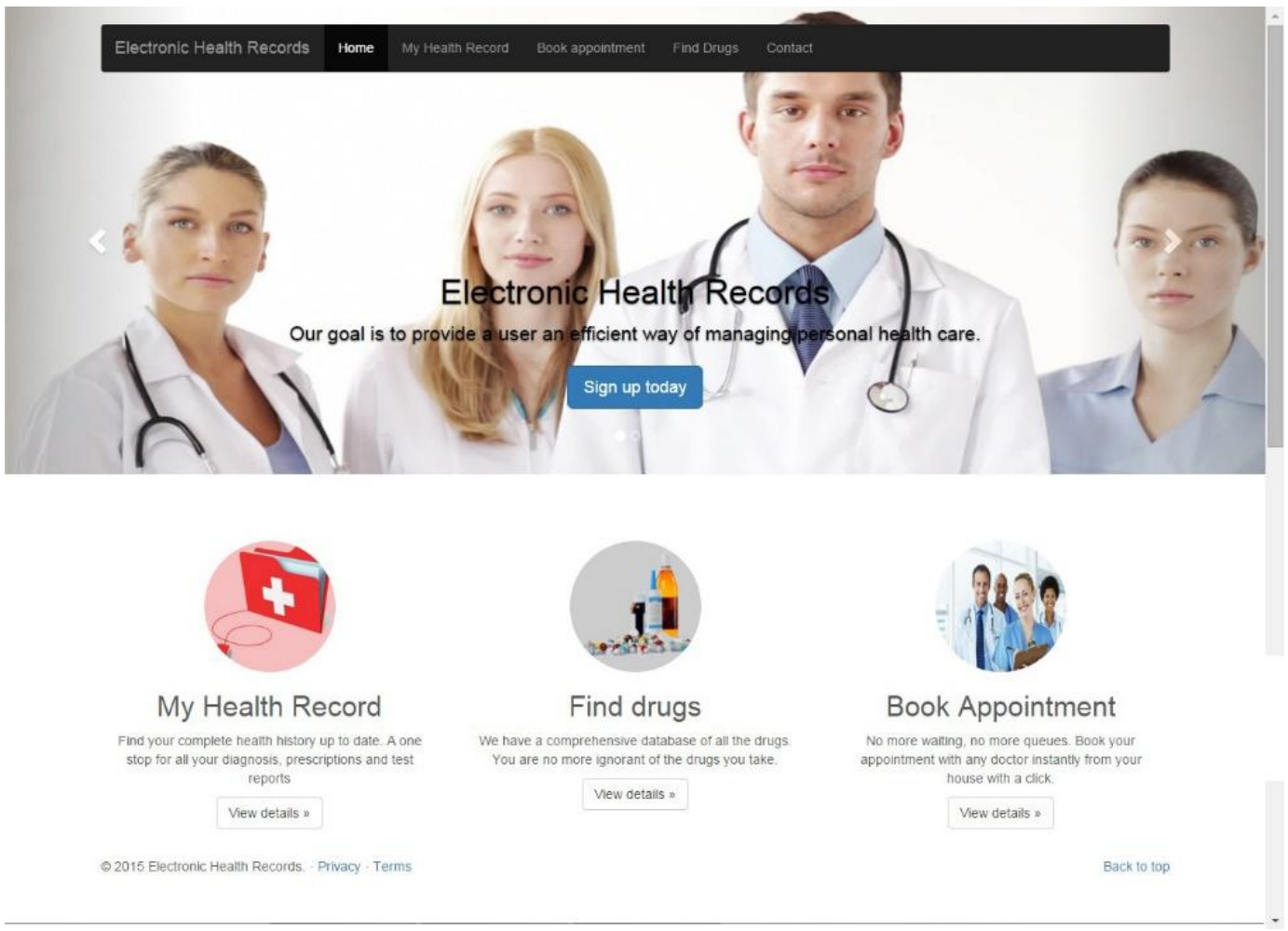
Computer:

The software's used for creating this project are:

- **HTML 5:** Used for designing all the basic elements in the website.
- **CSS:** Used for styling properties of all the webpages.
- **JAVASCRIPT:** Used for the functioning of buttons and lists.
- **BOOTSTRAP FRAMEWORK:** Used for creating some predefined objects and icons, which makes the designing of webpage easier and more consistent.
- **PHP:** Used for retrieving information from databases to display the required information on the webpages.
- **WAMP SERVER:** Used for running the webpages on a localhost and to run the page from server side to run the php code to extract data.

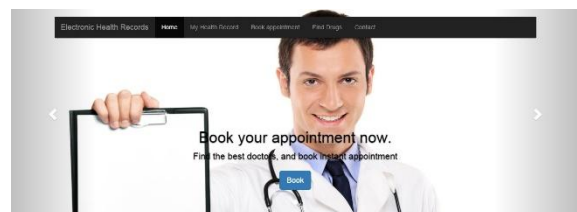
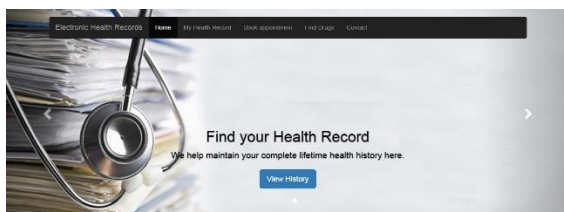


HOME PAGE:



Major takeaways from the home page are:

- The colour scheme used is very pleasant and the use of images made the home page more attractive to the user.
- Used a carousel element which makes the pictures slide in the webpage which is interesting to the user.



- The major functions of the project are clearly shown on the webpage with a two line description, so that the user can understand what the website does from the moment he opens the site
- Small icons are used which depict the function they perform.
- The navigation bar at the top allows the user to jump to other pages or he can use the view details button of each function below, which redirects them to that particular page.

Source code for Home Page:

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <!-- The above 3 meta tags *must* come first in the head; any other head content must come *after* these tags
-->
    <meta name="description" content="">
    <meta name="author" content="">
    <link rel="icon" href=" ../favicon.ico">
    <title>EHR</title>
    <!-- Bootstrap core CSS -->
    <link href="css/bootstrap.min.css" rel="stylesheet">
    <!-- Just for debugging purposes. Don't actually copy these 2 lines! -->
    <!--[if lt IE 9]><script src=" ../assets/js/ie8-responsive-file-warning.js"></script><![endif]-->
    <script src="js/ie-emulation-modes-warning.js"></script>
    <!-- HTML5 shim and Respond.js for IE8 support of HTML5 elements and media queries -->
    <!--[if lt IE 9]>
      <script src="https://oss.maxcdn.com/html5shiv/3.7.2/html5shiv.min.js"></script>
      <script src="https://oss.maxcdn.com/respond/1.4.2/respond.min.js"></script>
    <![endif]-->
    <!-- Custom styles for this template -->
    <link href="carousel.css" rel="stylesheet">
  </head>
  <!-- NAVBAR
===== -->
  <body>
    <div class="navbar-wrapper">
      <div class="container">
        <nav class="navbar navbar-inverse navbar-static-top">
          <div class="container">
            <div class="navbar-header">
              <button type="button" class="navbar-toggle collapsed" data-toggle="collapse" data-target="#navbar"
aria-expanded="false" aria-controls="navbar">
                <span class="sr-only">Toggle navigation</span>
                <span class="icon-bar"></span>
                <span class="icon-bar"></span>
                <span class="icon-bar"></span>
              </button>
              <a class="navbar-brand" href="index.html">Electronic Health Records</a>
            </div>
            <div id="navbar" class="navbar-collapse collapse">
```

```

<ul class="nav navbar-nav">
  <li class="active"><a href="index.html">Home</a></li>
  <li><a href="healthrec.html">My Health Record</a></li>
  <li><a href="book.html">Book appointment</a></li>
  <!-- <li class="dropdown">
    <a href="#" class="dropdown-toggle" data-toggle="dropdown" role="button" aria-haspopup="true"
aria-expanded="false">Dropdown <span class="caret"></span></a>
    <ul class="dropdown-menu">
      <li><a href="#">Action</a></li>
      <li><a href="#">Another action</a></li>
      <li><a href="#">Something else here</a></li>
      <li role="separator" class="divider"></li>
      <li class="dropdown-header">Nav header</li>
      <li><a href="#">Separated link</a></li>
      <li><a href="#">One more separated link</a></li>
    </ul>
  </li> -->
  <li><a href="findrug.html">Find Drugs</a></li>
  <li><a href="#contact">Contact</a></li>
</ul>
</div>
</div>
</nav>
</div>
</div>
<!-- Carousel
===== -->
<div id="myCarousel" class="carousel slide" data-ride="carousel">
  <!-- Indicators -->
  <ol class="carousel-indicators">
    <li data-target="#myCarousel" data-slide-to="0" class="active"></li>
    <li data-target="#myCarousel" data-slide-to="1"></li>
    <li data-target="#myCarousel" data-slide-to="2"></li>
  </ol>
  <div class="carousel-inner" role="listbox">
    <div class="item active">
      
      <div class="container">
        <div class="carousel-caption">
          <h1>Electronic Health Records</h1>
          <p>Our goal is to provide a user an efficient way of managing personal health care.</p>
          <p><a class="btn btn-lg btn-primary" href="#" role="button">Sign up today</a></p>
        </div>
      </div>
    </div>
    <div class="item">
      
      <div class="container">
        <div class="carousel-caption">
          <h1>Book your appointment now.</h1>
          <p>Find the best doctors, and book instant appointment</p>
          <p><a class="btn btn-lg btn-primary" href="book.html" role="button">Book</a></p>
        </div>
      </div>
    </div>
  </div>
</div>

```

```

    </div>
</div>
<div class="item">
    
    <div class="container">
        <div class="carousel-caption">
            <h1>Find your Health Record</h1>
            <p>We help maintain your complete lifetime health history here.</p>
            <p><a class="btn btn-lg btn-primary" href="#" role="button">View History</a></p>
        </div>
    </div>
</div>
</div>
<a class="left carousel-control" href="#myCarousel" role="button" data-slide="prev">
    <span class="glyphicon glyphicon-chevron-left" aria-hidden="true"></span>
    <span class="sr-only">Previous</span>
</a>
<a class="right carousel-control" href="#myCarousel" role="button" data-slide="next">
    <span class="glyphicon glyphicon-chevron-right" aria-hidden="true"></span>
    <span class="sr-only">Next</span>
</a>
</div><!-- /.carousel -->
<!-- Marketing messaging and featurettes
===== -->
<!-- Wrap the rest of the page in another container to center all the content. -->
<div class="container marketing">
    <!-- Three columns of text below the carousel -->
    <div class="row">
        <div class="col-lg-4">
            
            <h2>My Health Record</h2>
            <p>Find your complete health history up to date. A one stop for all your diagnosis, prescriptions and test
reports</p>
            <p><a class="btn btn-default" href="healthrec.html" role="button">View details &raquo;</a></p>
        </div><!-- /.col-lg-4 -->
        <div class="col-lg-4">
            
            <h2>Find drugs</h2>
            <p>We have a comprehensive database of all the drugs. You are no more ignorant of the drugs you take.</p>
            <p><a class="btn btn-default" href="findrug.html" role="button">View details &raquo;</a></p>
        </div><!-- /.col-lg-4 -->
        <div class="col-lg-4">
            
            <h2>Book Appointment</h2>
            <p>No more waiting, no more queues. Book your appointment with any doctor instantly from your house
with a click.</p>
            <p><a class="btn btn-default" href="book.html" role="button">View details &raquo;</a></p>
        </div><!-- /.col-lg-4 -->
    </div><!-- /.row -->
<!-- FOOTER -->
<footer>

```

```

<p class="pull-right"><a href="#">Back to top</a></p>
<p>&copy; 2015 Electronic Health Records. &middot; <a href="#">Privacy</a> &middot; <a href="#">Terms</a></p>
</footer>
</div><!-- /.container -->
<!-- Bootstrap core JavaScript
===== -->
<!-- Placed at the end of the document so the pages load faster -->
<script src="https://ajax.googleapis.com/ajax/libs/jquery/1.11.3/jquery.min.js"></script>
<script src="js/bootstrap.min.js"></script>
<!-- Just to make our placeholder images work. Don't actually copy the next line! -->
<script src="js/vendor/holder.min.js"></script>
<!-- IE10 viewport hack for Surface/desktop Windows 8 bug -->
<script src="js/ie10-viewport-bug-workaround.js"></script>
</body>
</html>

```

My Health Record Page:

Electronic Health Records Home **My Health Record** Book appointment Find Drugs Contact

Add Health Record

Fill in all the details and click Add to add health record to health history

ICD-code/Medical term

Select Incident date and time:

Select severity level:
☒ normal ☐ slightly severe ☐ severe ☐ very severe ☐ critical

Enter symptoms and description of the case:

Prescription Drugs:

Upload test reports(if any):

Attach any test reports if required.

My Health history

Click on an item to expand and view details.

1. ICD code:844, Sprain of knee : 12/04/2015 1
 No. of Incidents : 1
 Symptoms & Description : The patient has suffered a ligament tear in the knee while playing football. Requires two weeks of bed rest. The knee must be provided support with the help of a bandage.
 Prescribed Drugs : Aspirin
 Test Reports : X-ray report
2. ICD code:536.8, Abnormal gastric acidity : 10/15/2015 1
3. ICD code: 427.5, Cardiac arrest : 07/23/2013 1
4. ICD code: 487, Influenza/flu: 11/23/2014 3
5. ICD code: 346, Migraine: 01/14/2011 5

The health record page is divided into two halves. The left half can be used by the doctor's for adding a health record page into the patient's history, while the right half shows the patient's health history with different colours each having its own meaning which will be explained later in the section.

Steps to add a health record:

Add Health Record

Fill in all the details and click Add to add health record to health history

ICD-code/Medical term
692.71, Sunburn

Select Incident date and time:
03/12/2015 10:22:48

Select severity level:
☒ normal ☐ slightly severe

Enter symptoms and description of the case:

Prescription Drugs:

Add Health Record

Fill in all the details and click Add to add health record to health history

ICD-code/Medical term
692.71, Sunburn

Select Incident date and time:
03/12/2015 10:22:48

Select severity level:
☒ normal ☐ slightly severe

Enter symptoms and description of the case:

Prescription Drugs:

To add a health record, first enter the ICD code or medical term of the patient's problem in the text box. Also the doctor may insert the number of incidents in the same box. Then to select the date and time, click on the small calendar icon. Select the required date in it and then click on the small clock icon which then allows the user to select the time.

Add Health Record

Fill in all the details and click Add to add health record to health history

ICD-code/Medical term
692.71 Sunburn

Select Incident date and time:
08/12/2015 13:27:32

Select severity level:
☒ normal ☐ slightly severe ☐ severe ☐ very severe ☐ critical

Enter symptoms and description of the case:
The Patient has been affected with sunburn. Symptoms are red, painful, itchy skin that's hot to the touch.

Prescription Drugs:
Lidocaine to the affected area, Benzocaine to the affected area (SensiGel)

Upload test reports(if any):
Choose File No file chosen
Choose File No file chosen
Choose File No file chosen
Choose File No file chosen

Attach any test reports if required.

+ Add

After that there is a field for selecting the severity of the case. The doctor may have 5 options to select the severity level of the case.

Depending on the selected severity level, corresponding colour would be shown as the background for the health record in the history. This would be useful next time, as the user will understand the severity of an older case just by seeing its colour.

The colour scheme used is:

Normal-green

Slightly severe-yellow

Severe-orange

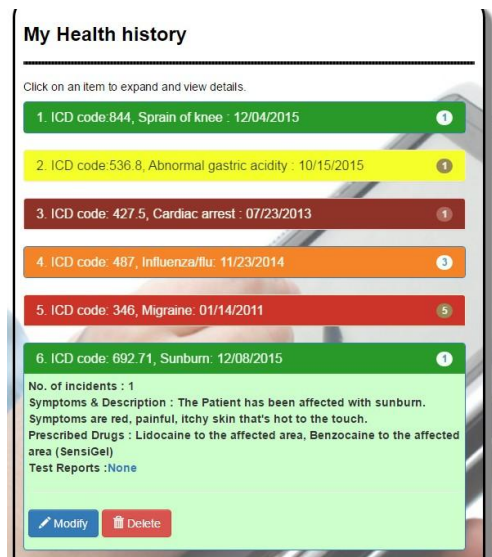
Very Severe- red

Critical- dark red

Next, the doctor can enter the symptoms of the case and also other details and description for the case.

The prescription drugs can also be entered in the next field with the dosage details and any side effects if applicable. Next, there is an option for the doctor to upload test reports as files. So that it will be helpful for future reference. Test reports like X-ray scans, MRI scan reports, etc.

Finally, click on the ADD button to add the record to the health history panel on the right side.



In the right panel, in My Health History, the result is reflected in the form of a record. The no of incidents is shown as a form of badge in each record. Each record can be viewed by clicking on the record. When the record is clicked, it expands. Two options for modifying or deleting are given for each record.

Source code for My Health Record Page:

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <!-- The above 3 meta tags *must* come first in the head; any other head content must come *after*
these tags -->
    <meta name="description" content="">
    <meta name="author" content="">
    <link rel="icon" href=" .././favicon.ico">

    <title>EHR</title>

    <!-- Bootstrap core CSS -->
    <link href="css/bootstrap.min.css" rel="stylesheet">
    <link rel="stylesheet" type="text/css" href="css/style.css">
    <!-- Just for debugging purposes. Don't actually copy these 2 lines! -->
    <!--[if lt IE 9]><script src=" .././assets/js/ie8-responsive-file-warning.js"></script><![endif]-->
    <script src="js/ie-emulation-modes-warning.js"></script>

    <!-- HTML5 shim and Respond.js for IE8 support of HTML5 elements and media queries -->
    <!--[if lt IE 9]>
      <script src="https://oss.maxcdn.com/html5shiv/3.7.2/html5shiv.min.js"></script>
      <script src="https://oss.maxcdn.com/respond/1.4.2/respond.min.js"></script>
    <![endif]-->

    <!-- Custom styles for this template -->
```

```

<link href="carousel.css" rel="stylesheet">

<!-- for date and time picker -->
<link href="http://netdna.bootstrapcdn.com/twitter-bootstrap/2.2.2/css/bootstrap-combined.min.css"
rel="stylesheet">
<link rel="stylesheet" type="text/css" media="screen"
href="http://tarruda.github.com/bootstrap-datetimepicker/assets/css/bootstrap-
datetimepicker.min.css">

<!-- for expand and collapse -->
<meta name="viewport" content="width=device-width, initial-scale=1">
<link rel="stylesheet" href="http://maxcdn.bootstrapcdn.com/bootstrap/3.3.5/css/bootstrap.min.css">
<script src="https://ajax.googleapis.com/ajax/libs/jquery/1.11.3/jquery.min.js"></script>
<script src="http://maxcdn.bootstrapcdn.com/bootstrap/3.3.5/js/bootstrap.min.js"></script>
</head>
<!-- NAVBAR
===== -->
<body>
<div class="navbar-wrapper">
<div class="container">
<nav class="navbar navbar-inverse navbar-static-top">
<div class="container">
<div class="navbar-header">
<button type="button" class="navbar-toggle collapsed" data-toggle="collapse" data-
target="#navbar" aria-expanded="false" aria-controls="navbar">
<span class="sr-only">Toggle navigation</span>
<span class="icon-bar"></span>
<span class="icon-bar"></span>
<span class="icon-bar"></span>
</button>
<a class="navbar-brand" href="index.html">Electronic Health Records</a>
</div>
<div id="navbar" class="navbar-collapse collapse">
<ul class="nav navbar-nav">
<li><a href="index.html">Home</a></li>
<li class="active"><a href="healthrec.html">My Health Record</a></li>
<li><a href="book.html">Book appointment</a></li>
<li><a href="findrug.html">Find Drugs</a></li>
<li><a href="#contact">Contact</a></li>
</ul>
</div>
</div>
</div>
<div class="left_pane1" style="margin-left:8%; margin-top:6%;">

```

```

<h3 class="pad1"><b> <font color="black";>Add Health Record</font><b></h3>
<hr style="border: 2px dotted " color="black" size="2">
<h5><font color="black";>Fill in all the details and click Add to add health record to health
history</font></h5></br>
<div class="form-group">
  <label for="icdmed"><font color="black";>ICD-code/Medical term</font></label>
  <input type="text" style="border-color:black;" class="form-control" id="icdmed"
placeholder="ICD/Medical term">
</div>
  <div class="input-group">
    <!-- <span class="input-group-addon" id="basic-addon1">Select date and time </span></br> -->
    <label for="datetimepicker"><font color="black";>Select Incident date and time:</font></label>
    <div id="datetimepicker" class="input-append date">
<input type="text" style="border-color:black;"></input>
<span class="add-on">
  <i data-time-icon="icon-time" data-date-icon="icon-calendar"></i>
</span>
</div>
<script type="text/javascript"
src="http://cdnjs.cloudflare.com/ajax/libs/jquery/1.8.3/jquery.min.js">
</script>
<script type="text/javascript"
src="http://netdna.bootstrapcdn.com/twitter-bootstrap/2.2.2/js/bootstrap.min.js">
</script>
<script type="text/javascript"
src="http://tarruda.github.com/bootstrap-datetimepicker/assets/js/bootstrap-
datetimepicker.min.js">
</script>
<script type="text/javascript"
src="http://tarruda.github.com/bootstrap-datetimepicker/assets/js/bootstrap-datetimepicker.pt-
BR.js">
</script>
<script type="text/javascript">
  $('#datetimepicker').datetimepicker({
    format: 'dd/MM/yyyy hh:mm:ss',
    language: 'en'
  });
</script></br>
</div>
<label for="inlineRadio"><b><font color="black";>Select severity level:</font></b></label>
<div id="inlineRadio">
  <label class="radio-inline">
    <input type="radio" style="border-color:black;" name="inlineRadioOptions" id="inlineRadio1"
value="option1"><b>normal</b>
  </label>
  <label class="radio-inline">
    <input type="radio" style="border-color:black;" name="inlineRadioOptions" id="inlineRadio2"
value="option2"><b>slightly severe</b>

```

```

        </label>
        <label class="radio-inline">
            <input type="radio" style="border-color:black;" name="inlineRadioOptions" id="inlineRadio3"
value="option3"><b>severe</b>
        </label>
        <label class="radio-inline">
            <input type="radio" style="border-color:black;" name="inlineRadioOptions" id="inlineRadio4"
value="option3"><b>very severe</b>
        </label>
        <label class="radio-inline">
            <input type="radio" style="border-color:black;" name="inlineRadioOptions" id="inlineRadio5"
value="option3"><b>critical</b>
        </label>
    </div></br>
    <label for="textar"><font color="black";>Enter symptoms and description of the case:</font></label>
    <textarea style="border-color:black;" class="form-control" id="textar" rows="5"></textarea>
    <label for="textar1"><font color="black";>Prescription Drugs:</font></label>
    <textarea style="border-color:black;" class="form-control" id="textar1" rows="2"></textarea>
    <div class="form-group">
        <label for="exampleInputFile1"><font color="black";>Upload test reports(if any):</font></label>
        <input type="file" id="exampleInputFile1" >
        <input type="file" id="exampleInputFile1" >
        <input type="file" id="exampleInputFile1">

        <p><font color="black";>Attach any test reports if required.</font></p>
    </div>

    <button type="button" class="btn btn-success" style="float:right;border-color:black;border-style:solid;">
        <span class="glyphicon glyphicon-plus"></span> <font border-color:"black;">Add</font>
    </button>
</div>
<div class='right_pane' style="margin-top:6%; margin-right:8%;">
    <h3 style="margin-top:20px;"><b><font color="black";>My Health history</font></b></h3>
    <hr style="border: 2px dotted " color="black" size="2">
    <h5><font color="black";>Click on an item to expand and view details.</font></h5>
    <div class="panel-group" style="margin-right:2%;">
        <div class="panel panel-primary">
            <div class="panel-heading p1">
                <h4 class="panel-title">
                    <a data-toggle="collapse" href="#collapse1">1. ICD code:844, Sprain of knee : 12/04/2015<span
class="badge" style="float:right;">1</span></a>
                </h4>
            </div>
            <div id="collapse1" class="panel-collapse collapse" style="padding:5px;">
                <p><b>No. of incidents :</b> 1</li><br/>
                <b>Symptoms & Description :</b> The patient has suffered a ligament tear in the knee while playing
football. Requires two weeks of bed rest. The knee must be provided support with the help of a
bandage.<br/>

```

Prescribed Drugs : Aspirin

Test Reports : [X-ray report](#xray)

> Modify

</button>

> Delete

</button>

</p>

</div></div>

<div class="panel-group" >

<div class="panel panel-warning">

<div class="panel-heading p2">

<h4 class="panel-title">

<a data-toggle="collapse" href="#collapse2">2. ICD code:536.8, Abnormal gastric acidity : 10/15/2015 1

</h4>

</div>

<div id="collapse2" class="panel-collapse collapse" style="padding:5px;" >

<p>No. of incidents : 1

Symptoms & Description : The patient is suffering from gastric problem in his stomach. Probably he is having acidity

Prescribed Drugs : Ranitidine, Zantac

Test Reports : [blood test](#xray)

> Modify

</button>

> Delete

</button>

</p>

</div></div>

<div class="panel-group">

<div class="panel panel-danger">

<div class="panel-heading p3">

<h4 class="panel-title">

<a data-toggle="collapse" href="#collapse3">3. ICD code: 427.5, Cardiac arrest : 07/23/20131

</h4>

</div>

```

<div id="collapse3" class="panel-collapse collapse" style="padding:5px;">
  <p><b>No. of incidents :</b> 1</li><br/>
  <b>Symptoms & Description :</b> The patient has suffered from a cardiac arrest. The reason is yet
unknown.<br/>
  <b>Prescribed Drugs :</b></br>
  <b>Test Reports :</b><a href="#xray">ECG reports</a></br><hr>

  <button type="button" class="btn btn-primary" data-deleting-text="&lt;span class='glyphicon
glyphicon-pencil'&gt;&lt;/span&gt; Modifying...">
    <span class="glyphicon glyphicon-pencil"></span> Modify
  </button>
  <button type="button" class="btn btn-danger" data-deleting-text="&lt;span class='glyphicon
glyphicon-trash'&gt;&lt;/span&gt; Deleting...">
    <span class="glyphicon glyphicon-trash"></span> Delete
  </button>
</p>
</div></div></br>
<div class="panel-group">
  <div class="panel panel-primary">
    <div class="panel-heading p4">
      <h4 class="panel-title">
        <a data-toggle="collapse" href="#collapse4">4. ICD code: 487, Influenza/flu: 11/23/2014<span
class="badge" style="float:right;">3</span></a>
      </h4>
    </div>
    <div id="collapse4" class="panel-collapse collapse" style="padding:5px;" >

      <p><b>No. of incidents :</b> 3</li><br/>
      <b>Symptoms & Description :</b> The patient has got a running nose and is coughing frequently. Has
symptoms of dry cough, sore throat, headache.<br/>
      <b>Prescribed Drugs :</b>Zanamivir by inhaling (Relenza), Oseltamivir (Tamiflu), Peramivir by
injection<br/>
      <b>Test Reports :</b><a href="#xray">None</a></br><hr>
      <button type="button" class="btn btn-primary" data-deleting-text="&lt;span class='glyphicon
glyphicon-pencil'&gt;&lt;/span&gt; Modifying...">
        <span class="glyphicon glyphicon-pencil"></span> Modify
      </button>
      <button type="button" class="btn btn-danger" data-deleting-text="&lt;span class='glyphicon
glyphicon-trash'&gt;&lt;/span&gt; Deleting...">
        <span class="glyphicon glyphicon-trash"></span> Delete
      </button>
    </p>
    </div></div></br>
    <div class="panel-group">
      <div class="panel panel-warning">
        <div class="panel-heading p5">
          <h4 class="panel-title">

```

```
<a data-toggle="collapse" href="#collapse5"><font color="white";>5. ICD code: 346, Migraine:
01/14/2011 </font><span class="badge" style="float:right;">5</span></a>
</h4>
</div>
<div id="collapse5" class="panel-collapse collapse" style="padding:5px;" >
  <p><b>No. of incidents :</b> 5</li><br/>
  <b>Symptoms & Description :</b> Migraine headaches can cause throbbing in one particular area that
can vary in intensity. Nausea and sensitivity to light and sound are also common symptoms.<br/>
  <b>Prescribed Drugs :</b>Ibuprofen (Advil), Naproxen, Acetaminophen/aspirin/caffeine (Excedrin),
Aspirin<br/>
  <b>Test Reports :</b><a href="#xray">MRI scan</a></br><hr>
  <button type="button" class="btn btn-primary" data-deleting-text="&lt;span class='glyphicon
glyphicon-pencil'&gt;&lt;/span&gt; Modifying...">
    <span class="glyphicon glyphicon-pencil"></span> Modify
  </button>
  <button type="button" class="btn btn-danger" data-deleting-text="&lt;span class='glyphicon
glyphicon-trash'&gt;&lt;/span&gt; Deleting...">
    <span class="glyphicon glyphicon-trash"></span> Delete
  </button>
</p>
</div></div></br>

<div class="panel-group">
<div class="panel panel-primary">
<div class="panel-heading p1">
<h4 class="panel-title">
  <a data-toggle="collapse" href="#collapse6"><font color="white";>6. ICD code: 692.71, Sunburn:
12/08/2015 </font><span class="badge" style="float:right;">1</span></a>
  </h4>
</div>
<div id="collapse6" class="panel-collapse collapse" style="padding:5px;" >
  <p><b>No. of incidents :</b> 1</li><br/>
  <b>Symptoms & Description :</b> The Patient has been affected with sunburn. Symptoms are red,
painful, itchy skin that's hot to the touch.<br/>
  <b>Prescribed Drugs :</b> Lidocaine to the affected area, Benzocaine to the affected area
(SensiGel)<br/>
  <b>Test Reports :</b><a href="#xray">None</a></br><hr>
  <button type="button" class="btn btn-primary" data-deleting-text="&lt;span class='glyphicon
glyphicon-pencil'&gt;&lt;/span&gt; Modifying...">
    <span class="glyphicon glyphicon-pencil"></span> Modify
  </button>
  <button type="button" class="btn btn-danger" data-deleting-text="&lt;span class='glyphicon
glyphicon-trash'&gt;&lt;/span&gt; Deleting...">
    <span class="glyphicon glyphicon-trash"></span> Delete
  </button>
</p>
</div></div></br>
</div>
```


</div>
</div>
</body>
</html>

Book Appointment Page:

The screenshot shows a web application for booking appointments. The top navigation bar includes links for Electronic Health Records, Home, My Health Record, Book appointment (highlighted), Find Drugs, and Contact. The main content is divided into two panels. The left panel, titled 'Book your Appointment here', contains four dropdown menus: 'Select Department', 'Select Doctor', 'Available days for the doctor', and 'Select Time'. At the bottom of this panel are two buttons: 'View my Appointments' and 'Book'. The right panel, titled 'Find your doctor', displays a list of three doctors: Dr. John, Dr. Philip, and Dr. Thompson. Each doctor's entry includes their name, department (Pediatrics), available days, available timings, and a rating. Dr. John's details are: Department: Pediatrics, Available days: M W F, Available timings: 5-8 p.m., Rating: 8/10. Dr. Philip's details are: Department: Pediatrics, Available days: W Th F, Available timings: 5-7 p.m., Rating: 8.5/10. Dr. Thompson's details are: Department: Pediatrics, Available days: Su, Available timings: 10a.m. - 12p.m.

The Book Appointment page is also divided into two panels. The left panel can be used for the patient to book an appointment with the doctor. While, the right panel can be used for finding the required doctor. All the details of the doctor like his name, his available days and timings, Ratings for each doctor are given.

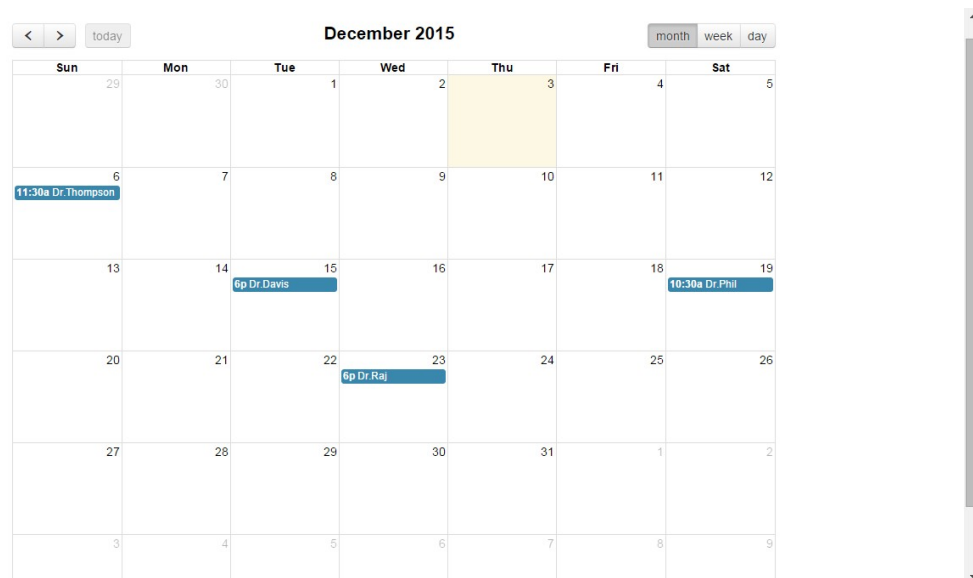
Now to book an appointment, the following steps are needed to be performed:

The first screenshot shows the 'Book your Appointment here' panel with the 'Select Department' dropdown menu open, displaying a list of departments: Pediatrics, Dermatology (highlighted), and Cardiology. The second screenshot shows the same panel with the 'Select Doctor' dropdown menu open, displaying a list of doctors: Dr. Tom, Dr. Davis, Dr. Phil (highlighted), and Dr. Raj. Both screenshots show the 'Available days for the doctor' and 'Select Time' dropdown menus at the bottom, along with the 'View my Appointments' and 'Book' buttons.

- Select the Department of the required doctor
- Select the doctor by his name
- Select the required day in which the doctor is available
- Select the time slot in the available time slots given by the doctor

To book the appointment click on the Book button. You can also view your already booked appointments by clicking on the view appointments page.

Clicking on either of the buttons would pop up a calendar showing the appointments as shown in the figure below:



Source code for Book Appointment:

```
<!DOCTYPE html>
<html lang="en">
  <head>
    <meta charset="utf-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1">
    <!-- The above 3 meta tags *must* come first in the head; any other head content must come
    *after* these tags -->
    <meta name="description" content="">
    <meta name="author" content="">
    <link rel="icon" href=".././favicon.ico">

    <title>EHR</title>
```

```

<!-- Bootstrap core CSS -->
<link href="css/bootstrap.min.css" rel="stylesheet">
<link rel="stylesheet" type="text/css" href="css/style.css">

<!-- Just for debugging purposes. Don't actually copy these 2 lines! -->
<!--[if lt IE 9]><script src="../../assets/js/ie8-responsive-file-warning.js"></script><![endif]-->
<script src="js/ie-emulation-modes-warning.js"></script>

<!-- HTML5 shim and Respond.js for IE8 support of HTML5 elements and media queries -->
<!--[if lt IE 9]>
  <script src="https://oss.maxcdn.com/html5shiv/3.7.2/html5shiv.min.js"></script>
  <script src="https://oss.maxcdn.com/respond/1.4.2/respond.min.js"></script>
<![endif]-->
<script type="text/javascript" src="js/book.js"></script>

<!-- Custom styles for this template -->
<link href="carousel.css" rel="stylesheet">
</head>
<!-- NAVBAR
===== -->
<body>
  <div class="navbar-wrapper">
    <div class="container">
      <nav class="navbar navbar-inverse navbar-static-top">
        <div class="container">
          <div class="navbar-header">
            <button type="button" class="navbar-toggle collapsed" data-toggle="collapse" data-
target="#navbar" aria-expanded="false" aria-controls="navbar">
              <span class="sr-only">Toggle navigation</span>
              <span class="icon-bar"></span>
              <span class="icon-bar"></span>
              <span class="icon-bar"></span>
            </button>
            <a class="navbar-brand" href="#">Electronic Health Records</a>
          </div>
          <div id="navbar" class="navbar-collapse collapse">
            <ul class="nav navbar-nav">
              <li><a href="index.html">Home</a></li>
              <li><a href="healthrec.html">My Health Record</a></li>
              <li class="active"><a href="#book">Book appointment</a></li>
              <li><a href="findrug.html">Find Drugs</a></li>
              <li><a href="#contact">Contact</a></li>
            </ul>
          </div>
        </div>
      </nav>
      

```

```

<div class="left_pane">
  <h2 class="pad"> <b><font color="black";>Book your Appointment here</font></b></h2>
  <hr style="border: 2px dotted " color="black" size="2">
  <h3><font color="black";><b>Select Department</b></font></h3>
  <select id="dept" class="form-control" value="dept" style="border-color:black;"
onchange="populate(this.id,'doc')">
    <option value=""></option>
    <option value="Pediatrics">Pediatrics</option>
    <option value="Dermatology">Dermatology</option>
    <option value="Cardiology">Cardiology</option>
  </select>
  <h3 class="pad"><font color="black";><b>Select Doctor</b></font></h3>
  <select id="doc" style="border-color:black;" class="form-control" value="doc"
onchange="populate2(this.id,'day')"></select>
  <h3 class="pad"><font color="black";><b> Available days for the doctor</b></font></h3>
  <select id="day" style="border-color:black;" class="form-control" value="day"
onchange="populate3('doc','time')"></select>
  <H3 class="pad"><font color="black";><b>Select Time</b></font></H3>
  <select id="time" style="border-color:black;" class="form-control" value="time"></select>
  </br>
</br></br>

  <button onclick=window.location="table.html" style="float:right;" type="button"
style="border-color:black;border-style:solid;" class="btn btn-success">Book</button>
  <button onclick=window.location="table.html" style="float:right;" type="button"
style="border-color:black;border-style:solid;" class="btn btn-primary">View my
Appointments</button>
  </br></br>
</div>

```

```

<div>
  <div class='right_pane1'>
    <h2 style="margin-top:4%; "><b><font color="black";>Find your doctor</font></b></h2>
    <hr style="border: 2px dotted " color="black" size="2">
    <div class="panel panel-info" style="border-color:black;">
      <div class="panel-heading" style="border-color:black;">
        <h3 class="panel-title"><b>Dr.John</b></h3>
      </div>
      <div class="panel-body">

        <p><font color="black";>
          <b>Department:</b> Pediatrics</br>
          <b>Available days:</b> M W F</br>
          <b>Available timings:</b> 5-8 p.m.</br>
          <b>Rating:</b>8/10</br></font>
        </p>

      </div>

```

```
</div>
<div class="panel panel-info" style="border-color:black;">
  <div class="panel-heading" style="border-color:black;">
    <h3 class="panel-title"><b>Dr.Philip</b></h3>
  </div>
  <div class="panel-body">

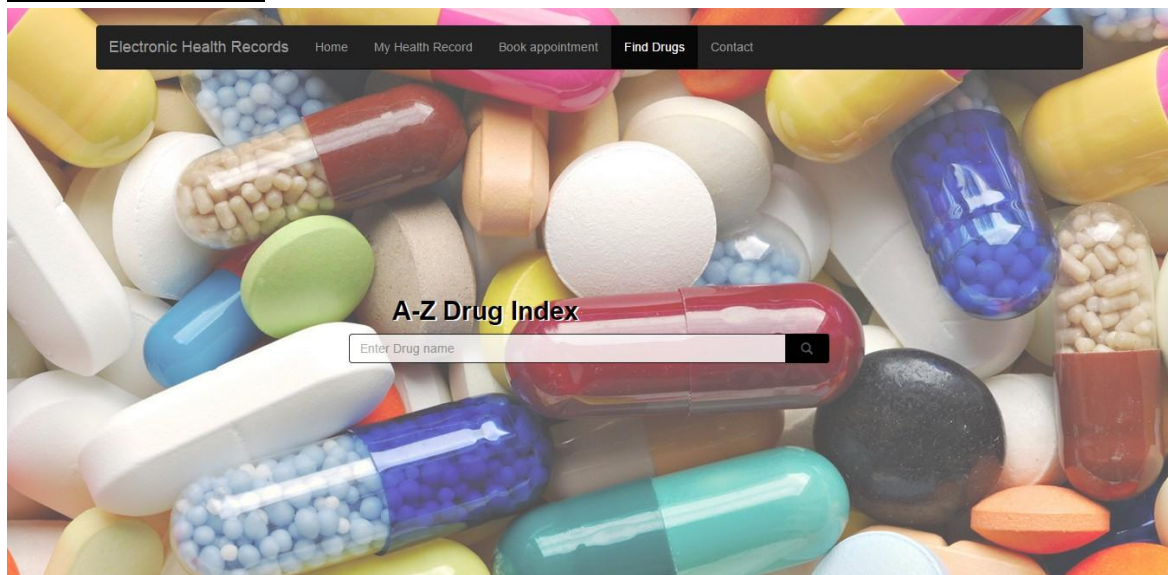
    <p><font color="black">
      <b>Department:</b> Pediatrics</br>
      <b>Available days:</b> W Th F</br>
      <b>Available timings:</b> 5-7 p.m.</br>
      <b>Rating:</b>8.5/10</br></font>
    </p>

  </div>
</div><div class="panel panel-info" style="border-color:black;">
  <div class="panel-heading" style="border-color:black;">
    <h3 class="panel-title"><b>Dr.Thompson</b></h3>
  </div>
  <div class="panel-body">
    <p><font color="black">
      <b>Department:</b> Pediatrics</br>
      <b>Available days:</b> Su</br>
      <b>Available timings:</b> 10a.m.- 12p.m.</br>
      <b>Rating:</b>9.5/10</br></font>
    </p>
  </div>
</div><div class="panel panel-info" style="border-color:black;">
  <div class="panel-heading" style="border-color:black;">
    <h3 class="panel-title"><b>Dr.Tom</b></h3>
  </div>
  <div class="panel-body">
    <p><font color="black">
      <b>Department:</b> Dermatology</br>
      <b>Available days:</b> M T W</br>
      <b>Available timings:</b> 2-3:30 p.m.</br>
      <b>Rating:</b>9/10</br></font>
    </p>
  </div>
</div><div class="panel panel-info" style="border-color:black;">
  <div class="panel-heading" style="border-color:black;">
    <h3 class="panel-title"><b>Dr.Davis</b></h3>
  </div>
  <div class="panel-body">
    <p><font color="black">
      <b>Department:</b> Dermatology</br>
      <b>Available days:</b> T W Th F</br>
      <b>Available timings:</b> 5-8 p.m.</br>
```

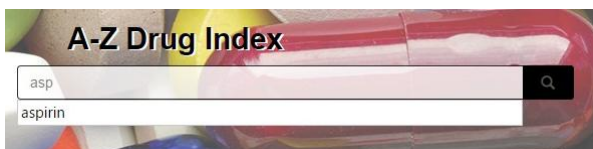
```
        <b>Rating:</b>7.5/10</br></font>
    </p>
</div>
</div><div class="panel panel-info">
    <div class="panel-heading">
        <h3 class="panel-title"><b>Dr.Phil</b></h3>
    </div>
    <div class="panel-body">
        <p><font color="black";>
            <b>Department:</b> Dermatology</br>
            <b>Available days:</b> S Su <br/>
            <b>Available timings:</b> 10 a.m.-12:30 p.m.</br>
            <b>Rating:</b>8.5/10</br></font>
        </p>
    </div>
</div><div class="panel panel-info" style="border-color:black;">
    <div class="panel-heading" style="border-color:black;">
        <h3 class="panel-title"><b>Dr.Raj</b></h3>
    </div>
    <div class="panel-body">
        <p><font color="black";>
            <b>Department:</b> Dermatology</br>
            <b>Available days:</b> W <br/>
            <b>Available timings:</b> 6-7 p.m.</br>
            <b>Rating:</b>7.5/10</br></font>
        </p>
    </div>
</div><div class="panel panel-info" style="border-color:black;">
    <div class="panel-heading" style="border-color:black;">
        <h3 class="panel-title"><b>Dr.Karen</b></h3>
    </div>
    <div class="panel-body">
        <p><font color="black";>
            <b>Department:</b> Cardiology</br>
            <b>Available days:</b> W Th<br/>
            <b>Available timings:</b> 10-11 a.m.</br>
            <b>Rating:</b>8/10</br></font>
        </p>
    </div>
</div>
<div class="panel panel-info" style="border-color:black;">
    <div class="panel-heading" style="border-color:black;">
        <h3 class="panel-title"><b>Dr.Thomas</b></h3>
    </div>
    <div class="panel-body">
        <p><font color="black";>
            <b>Department:</b> Cardiology</br>
            <b>Available days:</b> Th F<br/>
```

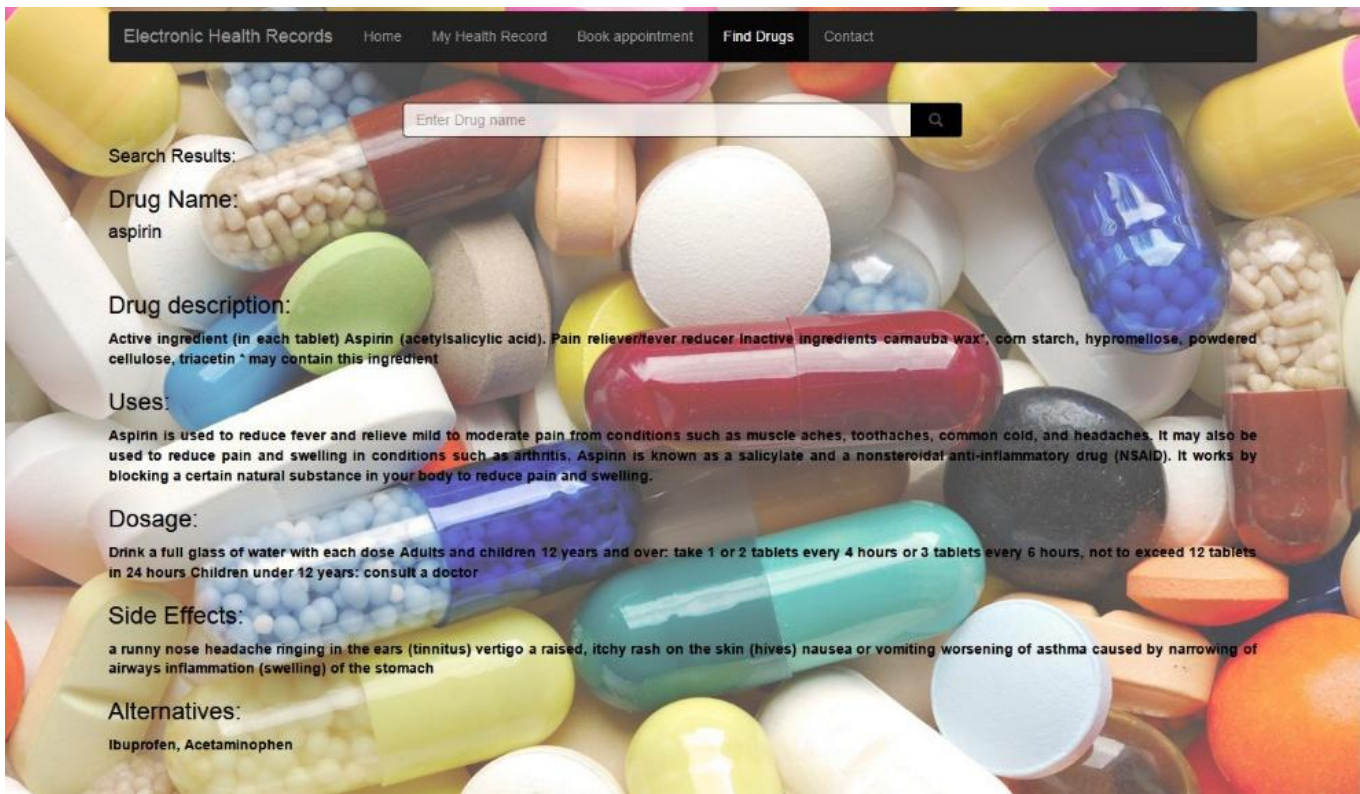
```
<b>Available timings:</b> 2-4 p.m.</br>
<b>Rating:</b>7.5/10</br></font>
</p>
</div>
</div>
</div>
</body>
</html>
```

Find Drugs Page:



The find drug page is designed with a simple search box in which the user can enter the name of any drug to get its details as shown in the figure below:





For each drug, the following details are displayed on the page:

- **Drug Name**
- **Drug Description:** It contains all the ingredients used to make the drug
- **Uses:** The various uses of the drug and the effects that it produces when consumed
- **Dosage :** Dosage details of how to consume the drug are presented
- **Side effects:** Many drugs that are consumed may cause some kind of side effects. Knowing them beforehand would be helpful
- **Alternatives:** The drugs that can be taken instead of the searched drug are shown here.

Source code for Find Drugs Page:

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="utf-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1">
  <!-- The above 3 meta tags *must* come first in the head; any other head content must come *after*
these tags -->
  <meta name="description" content="">
  <meta name="author" content="">
  <link rel="icon" href=" .././favicon.ico">
  <title>EHR</title>
  <!-- Bootstrap core CSS -->
  <link href="css/bootstrap.min.css" rel="stylesheet">
  <link rel="stylesheet" type="text/css" href="css/style.css">

  <!-- Just for debugging purposes. Don't actually copy these 2 lines! -->
  <!--[if lt IE 9]><script src=" .././assets/js/ie8-responsive-file-warning.js"></script><![endif]-->
```



```

<script src="js/ie-emulation-modes-warning.js"></script>

<!-- HTML5 shim and Respond.js for IE8 support of HTML5 elements and media queries -->
<!--[if lt IE 9]>
  <script src="https://oss.maxcdn.com/html5shiv/3.7.2/html5shiv.min.js"></script>
  <script src="https://oss.maxcdn.com/respond/1.4.2/respond.min.js"></script>
<![endif]-->

<!-- Custom styles for this template -->
<link href="carousel.css" rel="stylesheet">
</head>
<!-- NAVBAR
===== -->
<body>
  <div class="navbar-wrapper">
    <div class="container">
      <nav class="navbar navbar-inverse navbar-static-top">
        <div class="container">
          <div class="navbar-header">
            <button type="button" class="navbar-toggle collapsed" data-toggle="collapse" data-
target="#navbar" aria-expanded="false" aria-controls="navbar">
              <span class="sr-only">Toggle navigation</span>
              <span class="icon-bar"></span>
              <span class="icon-bar"></span>
              <span class="icon-bar"></span>
            </button>
            <a class="navbar-brand" href="#">Electronic Health Records</a>
          </div>
          <div id="navbar" class="navbar-collapse collapse">
            <ul class="nav navbar-nav">
              <li><a href="index.html">Home</a></li>
              <li><a href="healthrec.html">My Health Record</a></li>
              <li><a href="book.html">Book appointment</a></li>
              <li class="active"><a href="#drugs">Find Drugs</a></li>
              <li><a href="#contact">Contact</a></li>
            </ul>
          </div>
        </div>
      </nav>
    </div>
  </div>
  <div class="row">
    <div class="col-sm-6 col-sm-offset-3">
      <div id="imaginary_container">
        <H2 id="head">A-Z Drug Index</H2>
      </div>
    </div>
  </div>
  
  <div class="container">
    <div class="row">
      <div class="col-sm-6 col-sm-offset-3">
        <div id="imaginary_container">
          <H2 id="head">A-Z Drug Index</H2>
        </div>
      </div>
    </div>
  </div>
  <form name="form1" method="post" action="http://localhost/website/searchresults.php">
    <div class="col-sm-6 col-sm-offset-3">
      <div id="imaginary_container">
        <H2 id="head">A-Z Drug Index</H2>
      </div>
    </div>
  </form>

```

```

<div class="input-group stylish-input-group">
  <input type="text" name="search" class="form-control" placeholder="Enter Drug name" >
  <span class="input-group-addon">
    <button type="submit" name="Submit" value="Search">
      <span class="glyphicon glyphicon-search"></span>
    </button>
  </span>
</div>
</div>
</div>
</form>
</div>
</div>
</body>
</html>

```

Project testing:

I have tested this project by taking three groups of people. In group 1, I chose doctors and asked them to use the health record page. In group 2, I chose my room mates and asked them to use the book appointment page. In group 3, I chose my family members to use the find drug page.

When the group 1 has completed testing, they have given the feedback that adding or modifying a health record was very easy to learn and perform. The colours used to describe the severity was very innovative. However they suggested me to add more options to add details to health records. They suggested that the health records may not be very basic type.

After the group 2 has tested, they found the option of booking appointment from their home very helpful as they didn't want to wait in long queues to meet the doctor. They have suggested me to add a feature like timer, which would send a notification when the appointment is about to begin.

When the group 3 has completed testing, they found the find drug page attractive and simple and easy to use. They found the details of the drug very helpful. They said that they could learn the contents of the drug which they never knew before. They have suggested me to include some pictures of the drugs. Also suggested me to add some features like drug interaction, etc.

The difference between when I started the project and after I completed are:

When I started this project I had very little idea about the various software's like HTML, CSS, JAVASACRIPT and PHP. I had learnt about bootstrap framework to design the website. Because of the project, I have learnt how to think from the user's point of view and design it in such a way that it would be easy for every user to handle it. At first, I took time on how to design the project, but once I have planned the outline of the project, the work went on smoothly. I wanted to insert many other functions in m project like timer, drug interaction, etc. but couldn't do it due to lack of time. Finally, I have learnt a lot from the project and it was also interesting to work on it.

Major learnings from the subject and project are:

- The project has helped me in learning to design a basic website with some major functionalities. This has helped me learn HTML, CSS, JAVASCRIPT and PHP thoroughly.
- Have learnt about many new technologies in the classes
- The project has allowed me to think in the user's point of view while developing an application. All the problems faced by the users are thoroughly taken into account and tried to remove them.
- The concept of universal usability i.e. the ability for all the users to use the application was applied to the project
- Performed usability testing with the help of my family doctor's and my room mates. Using their feedback, tried to bring about changes in my project and they found it interesting and helpful.
- The concept of Human Computer Interaction was understood and implemented in the project.