Министерство науки и высшего образования Российской Федерации

Севастопольский государственный университет

Кафедра ИС

Отчет

по лабораторной работе №8

«Исследование архитектуры MVC приложения и возможностей обработки данных HTML-форм на стороне сервера с использованием языка PHP»

по дисциплине

«ВЕБ-ТЕХНОЛОГИИ»

Выполнил студент группы ИС/б-17-2-о

Горбенко К. Н.

Проверил

Овчинников А.Л.

Севастополь

2020

1 ЦЕЛЬ РАБОТЫ

Изучить основы синтаксиса PHP и принципы функционирования MVC приложения на стороне сервера. Приобрести практические навыки использования языка PHP для генерации HTML-кода и обработки HTML-форм в MVC приложении.

2 ХОД РАБОТЫ

2.1 Реализация маршрутизации

Для реализации MVC архитектуры создадим маршрутизацию вида `site/controller/action`, для этого используем `UrlRewrite` модуль и создадим входную точку приложения index.php.

.htaccess:

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

index.php:

```
1 <?php
2 include "Core/Router.php";
3
4 $request = $_REQUEST;
5 $requestMethod = $_SERVER["REQUEST_METHOD"];
6 Router::route($request, $requestMethod);
```

Теперь реализуем роутер, с разной мршрутизацией для `GET` и `POST` запросов.

Core/Router.php

```
1 class Router
2 {
3     protected static $actionPrefixesByMethod = array(
4         "GET" => "",
5         "POST" => "Post"
6     );
7
8     static function route($request, $requestMethod) {
9         $controllerName = self::getControllerName($request);
10        $actionName = self::getActionName($request, $requestMethod);
11
```

```
12          if ($requestMethod != "GET" && $requestMethod != "POST") {
13              http_response_code(ResponseCodes::$notAllowedMethodStatusCode);
14              die();
15          }
16
17          $controllerFileName = "Controllers/" . $controllerName . 'Controller.
                php';
18          if (file_exists($controllerFileName)) {
19              include $controllerFileName;
20          } else {
21              http_response_code(ResponseCodes::$notFoundStatusCode);
22              die();
23          }
24
25          $controllerClassName = ucfirst($controllerName) . 'Controller';
26          $container = Container::getInstance();
27          $controller = new $controllerClassName($container);
28
29          if (method_exists($controller, $actionName)) {
30              $controller->$actionName();
31          } else {
32              http_response_code(ResponseCodes::$notFoundStatusCode);
33              die();
34          }
35      }
36
37      private static function getControllerName($request) {
38          return array_key_exists("controller", $request)
39              ? $request["controller"]
40              : "Home";
41      }
42
43      private static function getActionName($request, $method) {
44          if (!array_key_exists("action", $request)) {
45              return "Index" . self::$actionPrefixesByMethod[$method];
46          }
47
48          return $request["action"] . self::$actionPrefixesByMethod[$method];
49      }
50 }
```

Данный класс, учитывая имена контроллера и экшена из строки параметров,
создает экземпляр соответствующего контроллера и вызывает соответствующий
экшен, если они существуют. Иначе, он возвращает 404 ответ.

2.2 Реализация MVC

Архитектура MVC состоит из контроллеров, моделей и представлений. Создадим первый контроллер:

Controllers/HomeContoller.php:

```php
class HomeController
{
    private $photosRepository;

    public function __construct(IContainer $container) {
        $this->photosRepository = $container->resolve("IPhotosRepository");
    }

    public function index() {
        ViewRenderer::render("Views/Home/Index.php", "Homepage");
    }

    public function about() {
        $viewModel = new AboutViewModel($this->photosRepository->getAll());
        ViewRenderer::render("Views/Home/About.php", "About me", $viewModel);
    }

    public function interests() {
        ViewRenderer::render("Views/Home/Interests.php", "My interests");
    }

    public function learning() {
        ViewRenderer::render("Views/Home/Learning.php", "Learning");
    }

    public function photos() {
        ViewRenderer::render("Views/Home/Photos.php", "Photo album");
    }

    public function history() {
        ViewRenderer::render("Views/Home/History.php", "History");
    }
}
```

ViewRenderer.php:

```php
class ViewRenderer
{
    static function render($viewName, $title, $viewModel = NULL, $layout = '
        Layout.php')
    {
        include "Views/Shared/".$layout;
```

```
6     }
7 }
```

Views/Shared/Layout.php:

```
1  <!DOCTYPE html>
2
3  <html lang="en">
4      <head>
5          <title><?=$title?></title>
6          <meta content="width=device-width" name="viewport" />
7          <meta content="no-cache" http-equiv="Cache-Control" />
8          <link href="../client-side/bundles/layout.bundle.css" rel="stylesheet"
               type="text/css" />
9      </head>
10     <body>
11         <nav>
12             <ul>
13                 <li><span>Web</span></li>
14                 <li><a href="/Home/Index">Home</a></li>
15                 <li><a href="/Home/About">About</a></li>
16                 <li><a href="/Home/Interests">My interests</a></li>
17                 <li><a href="/Home/Learning">Learning</a></li>
18                 <li><a href="/Home/Photos">Photos</a></li>
19                 <li><a href="/Contact/Index">Contact</a></li>
20                 <li><a href="/Test/Index">Test</a></li>
21                 <li><a href="/Home/History">History</a></li>
22                 <li><span id="time"></span><br/><span id="date"></span></li>
23             </ul>
24         </nav>
25         <img src="../client-side/images/portrait.jpg" class="portrait" alt="
              Portrait picture in on the back. Don't mind it" />
26
27         <div class="main-content">
28             <?php include($viewName); ?>
29         </div>
30
31         <footer class="full-width">
32             <section>
33                 <header><h2>Footer</h2></header>
34                 <p>Some useful links here</p>
35                 <ul>
36                     <li>Link</li>
37                     <li>Another link</li>
38                 </ul>
39                 <p>
40                     And some info as well: Nunc eget viverra neque, non
                        ullamcorper odio. Integer dolor sem, ultrices eu
41                     tempus dapibus, sagittis ac lacus. Duis rutrum turpis eu
```

```
                                lectus imperdiet , ac
42                          sagittis orci faucibus . Vestibulum volutpat fringilla
                                turpis vehicula lobortis .
43                          Interdum et malesuada fames ac ante ipsum primis in
                                faucibus . Aliquam posuere
44                          tempor enim , et tempus tellus commodo mattis . Sed
                                sollicitudin mauris vitae
45                          vestibulum malesuada .
46                  </p >
47              </ section >
48          </ footer >
49          < script src = " ../ client - side / bundles / layout . bundle . js " >
50      </ body >
51  </ html >
```

Views/Home/Index.php

```
1 < link href = " ../ client - side / bundles / home / index . bundle . css " rel = " stylesheet " type
     = " text / css " />
2
3 < header ><h1 > Portfolio </ h1 ></ header >
4 < section >
5      < header ><h2 > About me </ h2 ></ header >
6      <p ><i > Gorbenko Kirill Nikolaevich . </i ></p >
7 </ section >
8 < section >
9      < header ><h2 > NEXT CHAPTER </ h2 ></ header >
10 </ section >
11
12 < script src = " ../ client - side / bundles / home / index . bundle . js " ></ script >
```

Views/Home/About.php:

```
1 < link href = " ../ client - side / bundles / home / about . bundle . css " rel = " stylesheet " type
     = " text / css " />
2
3 < header >
4      <h1 > Autobiography </ h1 >
5 </ header >
6 < section >
7      < header >
8          <h1 > Section 1 </ h1 >
9      </ header >
10      <p > There should be some authobiography </p >
11      < ol >
12          < li >19 years old </ li >
13          < li >My parents 's son . </ li >
14          < li > Dunno </ li >
15      </ ol >
```

```
16    <p>Photos:</p>
17    <div class="photo-wrapper full-width">
18        <?php
19            foreach ($viewModel->photos as $photoName => $path) {
20                echo("<img src='$path' alt='$photoName' />");
21            }
22        ?>
23    </div>
24 </section>
25
26 <script src="../client-side/bundles/home/about.bundle.js"></script>
```

Views/Home/Interests.php:

```
 1 <link href="../client-side/bundles/home/interests.bundle.css" rel="stylesheet"
      type="text/css" />
 2
 3 <header>
 4    <h1>My interests</h1>
 5 </header>
 6 <section>
 7    <header>
 8        <h2>Contents</h2>
 9    </header>
10    <button class="modal-button" id="dialog">Modal</button>
11    <ul id="interests">
12        <li class="contents" id="Hobbies">My hobbies</li>
13        <li class="interests" id="Hobbies-expand">
14            <h2>My hobbies</h2>
15            <p>My hobbies are supposed to be here</p>
16        </li>
17        <li class="contents" id="Books">My books</li>
18        <li class="interests" id="Books-expand">
19            <h2>My books</h2>
20            <p>My books are supposed to be here</p>
21        </li>
22        <li class="contents" id="Music">My music</li>
23        <li class="interests" id="Music-expand">
24            <h2>My music</h2>
25            <p>My music is supposed to be here</p>
26        </li>
27        <li class="contents" id="Films">My films</li>
28        <li class="interests" id="Films-expand">
29            <h2>My films</h2>
30            <p>My films are supposed to be here</p>
31        </li>
32    </ul>
33 </section>
34
```

```
35 <div class="modal">
36     <div class="modal-window">
37         <div>
38             <p class="modal-message"></p>
39         </div>
40         <div class="modal-navigation">
41             <button class="modal-button modal-confirm-button"></button>
42             <button class="modal-button modal-cancel-button"></button>
43         </div>
44     </div>
45 </div>
46
47 <script src="../client-side/bundles/home/interests.bundle.js"></script>
```

Views/Home/Learning.php:

```
1 <link href="../client-side/bundles/home/learning.bundle.css" rel="stylesheet"
     type="text/css" />
2
3 <section>
4     <header>
5         <h1>Disciplines</h1>
6     </header>
7     <h2>Институт информационных технологий и управления в технических системах
         </h2>
8     <h2>Информационные системы и технологии</h2>
9     <table>
10        <tr>
11            <td colspan="9">Disciplines by semesters</td>
12        </tr>
13        <tr>
14            <th scope="row">First</th>
15            <td>Math</td>
16            <td>AIP</td>
17            <td>Info</td>
18            <td>Hitory</td>
19            <td>Physycs</td>
20            <td>Ecology</td>
21            <td>Descrete Math</td>
22            <td>English</td>
23        </tr>
24        <tr>
25            <th scope="row">Second</th>
26            <td>Math</td>
27            <td>AIP</td>
28            <td>Physics</td>
29            <td>Philosophy</td>
30            <td>Rights</td>
31            <td>Economics</td>
```

```
32            <td>BZD</td>
33            <td>English</td>
34         </tr>
35         <tr>
36            <th scope="row">Third</th>
37            <td>Architecture</td>
38            <td>Math</td>
39            <td>Discrete math</td>
40            <td>OOP</td>
41            <td>TEC</td>
42            <td>Economics</td>
43            <td>Graphics</td>
44            <td>English</td>
45         </tr>
46         <tr>
47            <th scope="row">Fourth</th>
48            <td>Electronics</td>
49            <td>Algorithms</td>
50            <td>Probability</td>
51            <td>English</td>
52            <td>System analysis</td>
53            <td>Databases</td>
54            <td>TSPP</td>
55            <td>OS</td>
56         </tr>
57      </table>
58 </section>
59
60 <script src="../client-side/bundles/home/learning.bundle.js"></script>
```

Views/Home/Photos.php:

```
1 <link href="../client-side/bundles/home/photos.bundle.css" rel="stylesheet"
     type="text/css" />
2
3 <header>
4    <h1>Photoalbum</h1>
5 </header>
6 <div class="photo-wrapper full-width"></div>
7
8 <div id="lightbox">
9    <div class="lightbox-content">
10       <div class="image-wrapper">
11          <img src="" />
12       </div>
13       <div>
14          <div class="lightbox-button lightbox-arrow-left">&lt;</div>
15          <div class="lightbox-button lightbox-arrow-right">&gt;</div>
16       </div>
```

```
17      </div>
18      <div class="lightbox-close×"></div>
19 </div>
20
21 <script src="../client-side/bundles/home/photos.bundle.js"></script>
```

Views/Home/History.php:

```
1 <link href="../client-side/bundles/home/history.bundle.css" rel="stylesheet"
     type="text/css" />
2
3 <header>
4      <h1>History</h1>
5 </header>
6 <section>
7      <header>
8          <h2>Session history</h2>
9      </header>
10     <table class="session-history">
11         <tr>
12             <th colspan="2">Session history</th>
13         </tr>
14         <tr>
15             <td>Home page</td>
16             <td class="home-page"></td>
17         </tr>
18         <tr>
19             <td>About me</td>
20             <td class="about-page"></td>
21         </tr>
22         <tr>
23             <td>My interests</td>
24             <td class="interests-page"></td>
25         </tr>
26         <tr>
27             <td>Learning</td>
28             <td class="learning-page"></td>
29         </tr>
30         <tr>
31             <td>Photo</td>
32             <td class="photos-page"></td>
33         </tr>
34         <tr>
35             <td>Contact</td>
36             <td class="contact-page"></td>
37         </tr>
38         <tr>
39             <td>Test</td>
40             <td class="test-page"></td>
```

```
41          </tr>
42          <tr>
43              <td>History</td>
44              <td class="history-page"></td>
45          </tr>
46      </table>
47  </section>
48  <section>
49      <header>
50          <h2>Day History</h2>
51      </header>
52      <table class="global-history">
53          <tr>
54              <th colspan="2">All-time history</th>
55          </tr>
56          <tr>
57              <td>Home page</td>
58              <td class="home-page"></td>
59          </tr>
60          <tr>
61              <td>About me</td>
62              <td class="about-page"></td>
63          </tr>
64          <tr>
65              <td>My interests</td>
66              <td class="interests-page"></td>
67          </tr>
68          <tr>
69              <td>Learning</td>
70              <td class="learning-page"></td>
71          </tr>
72          <tr>
73              <td>Photo</td>
74              <td class="photos-page"></td>
75          </tr>
76          <tr>
77              <td>Contact</td>
78              <td class="contact-page"></td>
79          </tr>
80          <tr>
81              <td>Test</td>
82              <td class="test-page"></td>
83          </tr>
84          <tr>
85              <td>History</td>
86              <td class="history-page"></td>
87          </tr>
88      </table>
```

```
89 </section>
90
91 <script src="../client-side/bundles/home/history.bundle.js"></script>
```

2.3 Реализация валидации форм

Создадим контроллер с экшеном, отрисовывающим форму.

Controllers/ContactController.php:

```
1 class ContactController
2 {
3     public function __construct(IContainer $container) {}
4
5     public function index() {
6         $viewModel = new ValidationViewModel(true, array());
7         ViewRenderer::render("Views/Contact/Index.php", "Contact me",
             $viewModel);
8     }
9
10     public function contactPost() {
11         $validator = new ContactRequestValidator($_POST);
12         $validationResult = $validator->validate();
13
14         if ($validationResult->isValid) {
15             ViewRenderer::render("Views/Contact/Success.php", "Contact me");
16             return;
17         }
18
19         $viewModel = new ValidationViewModel($validationResult->isValid,
             $validationResult->errors);
20         ViewRenderer::render("Views/Contact/Index.php", "Contact me",
             $viewModel);
21     }
22 }
```

Views/Contact/Index.php:

```
1 <link href="../client-side/bundles/contact/index.bundle.css" rel="stylesheet"
    type="text/css" />
2
3 <section>
4     <header>
5         <h1>Mail Me!</h1>
6     </header>
7     <p>All fields are required! Hover over fields to see the additional
        requirements.</p>
8
```

```
 9      <?php ViewHelper::writeValidationErrorsList($viewModel->errors); ?>
10
11      <form action="Contact" method="POST">
12          <ol>
13              <li>
14                  <label for="full-name-input">Full Name</label>
15                  <input class="field-long" id="full-name-input" name="Name" type
                        ="text" />
16                  <br/>
17              </li>
18              <li>
19                  <label for="email-input">Email</label>
20                  <input class="field-long" id="email-input" name="Email" type="
                        email" />
21                  <br/>
22              </li>
23              <li>
24                  <label for="phone-input">Phone number</label>
25                  <input class="field-long" id="phone-input" name="Phone" type="
                        text" />
26                  <br/>
27              </li>
28              <li>
29                  <label for="message-input">Your Message</label>
30                  <textarea class="field-long" id="message-input" name="Message
                        "></textarea>
31              </li>
32              <li>
33                  <label for="datepicker-input">Date</label>
34                  <input class="field-long" id="datepicker-input" name="Date"
                        type="text" />
35                  <br/>
36              </li>
37              <li>
38                  <input type="submit" value="Submit" />
39                  <br/>
40              </li>
41          </ol>
42      </form>
43 </section>
44
45 <script src="../client-side/bundles/contact/index.bundle.js"></script>
```

Views/Contact/Success.php

```
 1 <link href="../client-side/bundles/contact/success.bundle.css" rel="stylesheet"
       type="text/css" />
 2
 3 <h1>Thank you for your appeal!</h1>
```

```
4
5 <h2>I will try to contact you back as soon as I can!</h2>
6
7 <script src="../client-side/bundles/contact/success.bundle.js"></script>
```

Реализуем валидацию объекта $_POST с помощью библиотеки Valitron.

Validators/BaseRequestValidator.php:

```
1 abstract class BaseRequestValidator {
2     protected array $post;
3
4     public function __construct($post) {
5         if (empty($post)) {
6             http_response_code(ResponseCodes::$badRequestStatusCode);
7             die();
8         }
9         $this->post = $post;
10    }
11 }
```

Validators/ContactRequestValidator.php:

```
1 class ContactRequestValidator extends BaseRequestValidator {
2     public function __construct($post) {
3         parent::__construct($post);
4     }
5
6     public function validate() {
7         $v = new Validator($this->post);
8         $v->rule('required', ['Name', 'Email', 'Phone', 'Message', 'Date']);
9         $v->rule('regex', 'Name', '/[A-Za-z]+ [A-Za-z]+ [A-Za-z]+/');
10        $v->rule('email', 'Email');
11        $v->rule('regex', 'Phone', '/^[+][7|3]\d{9,11}$/');
12        $v->rule('dateFormat', 'Date', 'd.m.Y');
13
14        $isValid = $v->validate();
15        $errors = $v->errors();
16
17        return new ValidationResult($isValid, $errors);
18    }
19 }
```

Validators/ValidationResult.php:

```
1 class ValidationResult {
2     public bool $isValid;
3     public array $errors;
4
5     public function __construct(bool $isValid, array $errors) {
```

```
6              $this->isValid = $isValid;
7              $this->errors = $errors;
8         }
9    }
```

Создадим контроллер, обрабатывающий тест:

Controllers/TestController.php:

```
1    class TestController {
2         public function __construct(IContainer $container) {}
3
4         public function index() {
5              $viewModel = new ValidationViewModel(true, array());
6              ViewRenderer::render("Views/Test/Index.php", "Test", $viewModel);
7         }
8
9         public function testPost() {
10             $validator = new TestRequestValidator($_POST);
11             $validationResult = $validator->validate();
12
13             if ($validationResult->isValid) {
14                  $testVerification = new TestRequestVerification($_POST);
15                  $viewModel = new SuccessfulTestViewModel($testVerification->verify
                      ());
16                  ViewRenderer::render("Views/Test/Success.php", "Test", $viewModel);
17                  return;
18             }
19
20             $viewModel = new ValidationViewModel($validationResult->isValid,
                  $validationResult->errors);
21             ViewRenderer::render("Views/Test/Index.php", "Test", $viewModel);
22        }
23   }
```

Validators/TestRequestValidator.php:

```
1    class TestRequestValidator extends BaseRequestValidator {
2         public function __construct($post) {
3              parent::__construct($post);
4         }
5
6         public function validate() {
7              $v = new Validator($this->post);
8              $v->rule('required', ['Question1', 'Question2', 'Question3', 'Name', '
                  Email' ]);
9              $v->rule('integer', 'Question1')->rule('in', 'Question1', [ 1, 2 ]);
10             $v->rule('integer', 'Question2')->rule('in', 'Question2', [ 1, 2, 3 ]);
11             $v->rule('regex', 'Name', '/[A-Za-z]+ [A-Za-z]+ [A-Za-z]+/');
```

```
12          $v->rule('email', 'Email');
13
14          $isValid = $v->validate();
15          $errors = $v->errors();
16
17          return new ValidationResult($isValid, $errors);
18      }
19 }
```

Validators/TestRequestVerification.php:

```
1  class TestRequestVerification {
2      private array $post;
3
4      public function __construct($post) {
5          if (empty($post)) {
6              throw new InvalidArgumentException("$post");
7          }
8          $this->post = $post;
9      }
10
11     public function verify() {
12         $correctAnswers = array(
13             'Question1' => '1',
14             'Question2' => '2',
15             'Question3' => 'Correct answer'
16         );
17
18         $areAnswersCorrect = true;
19         foreach ($correctAnswers as $question => $answer) {
20             if ($this->post[$question] != $answer) {
21                 $areAnswersCorrect = false;
22             }
23         }
24
25         return $areAnswersCorrect;
26     }
27 }
```

ВЫВОДЫ

В ходе лабораторной работы было выполнено создание серверной части сайта на PHP с использованием архитектуры MVC. Для создания удобочитаемых URL использован UrlRewrite модуль PHP сервера. Для маршрутизации создан роутер. Валидация параметров формы осуществляется с помощью библиотеки Valitron.