**Answer Key**

1. **Analyze the PHP project structure**
   1. Download, extract, and save the **Book\_A\_Taxi** project in the **../xampp/htdocs** directory. The directory structure of this project is as follows:  
        
      A screen shot of a computer program

      Description automatically generated
   2. Open **XAMPP control panel** and start the required services, as shown in the screenshot below:  
        
      A screenshot of a computer

      Description automatically generated

|  |
| --- |
| **Note**: Download and install XAMPP from the link below: [**https://www.apachefriends.org/download.html**](https://www.apachefriends.org/download.html) |

* 1. Open the browser and navigate to [**http://localhost:8080/**](http://localhost:8080/)  
     A screenshot of a computer

     Description automatically generated

|  |
| --- |
| **Note**: Apache Tomcat appears if the service is running successfully, as shown in the above screenshot. |

* 1. Open the browser and navigate to [**http://localhost/Book\_A\_Taxi/**](http://localhost/Book_A_Taxi/) to verify if the project **Book\_A\_Taxi** is running successfully, as shown in the screenshot below:  
       
     A screenshot of a taxi application

     Description automatically generated

1. **Install Node.js and set up a React application**
   1. Open the **Book\_A\_Taxi** project in Visual Studio Code, as shown in the screenshot below:  
        
      A screenshot of a computer

      Description automatically generated
   2. Open a new window in Visual Studio Code and install the React application using the following command:  
      **npx create-react-app book\_a\_taxi**  
        
      A screenshot of a computer

      Description automatically generated
   3. Navigate to the PHP project, click on the **Chat** icon, and enter the following prompt to generate an equivalent React directory structure for the **Book\_A\_Taxi** project:  
      **@workspace Provide a React application directory structure that closely matches the structure of the Book\_A\_Taxi project**  
      A screenshot of a computer

      Description automatically generated

A screenshot of a computer

Description automatically generated

1. **Convert PHP pages into React components using GitHub Copilot**
   1. Enter the following prompt to convert the homepage, **index.php**, into React code:  
      **@workspace Convert the homepage into React and name it HomePage.js**  
        
        
        
      A screenshot of a computer

      Description automatically generated  
        
      A screenshot of a computer

      Description automatically generated  
        
      The generated code for **HomePage.js** is as follows:

**import React from 'react';**

**import { Link } from 'react-router-dom';**

**import '../App.css';**

**const HomePage = () => {**

**const handleSearch = (event) => {**

**event.preventDefault();**

**// Handle search logic here**

**};**

**return (**

**<div>**

**<header>**

**<h1>Welcome to BookATaxi</h1>**

**<nav>**

**<ul>**

**<li><Link to="/">Home</Link></li>**

**<li><Link to="/about">About Us</Link></li>**

**<li><Link to="/services">Services</Link></li>**

**<li><Link to="/contact">Contact</Link></li>**

**<li><Link to="/booking">Book a Ride</Link></li>**

**</ul>**

**</nav>**

**</header>**

**<main>**

**<section className="hero">**

**<h2>Find a Taxi Near You</h2>**

**<form onSubmit={handleSearch}>**

**<input type="text" name="location" placeholder="Enter your location" />**

**<button type="submit">Search</button>**

**</form>**

**</section>**

**<section className="services">**

**<h2>Our Services</h2>**

**<p>BookATaxi provides reliable taxi services 24/7. We have experienced drivers and ensure your safety and comfort.</p>**

**<ul>**

**<li>24/7 Availability</li>**

**<li>Safe and Reliable</li>**

**<li>Experienced Drivers</li>**

**</ul>**

**</section>**

**</main>**

**<footer>**

**<p>&copy; {new Date().getFullYear()} BookATaxi. All rights reserved.</p>**

**</footer>**

**</div>**

**);**

**};**

**export default HomePage;**

* 1. Perform the migration of basic pages such as **about.php**, **services.php**, and **contact.php** using the following prompt:  
     **@workspace Similarly, convert about.php, services.php, and contact.php to React files and name them AboutPage, ServicePage, and ContactPage**  
     A screenshot of a computer

     Description automatically generated  
       
     The generated React scripts are as follows:  
       
     **AboutPage.js**  
       
     **import React from 'react';**

**import { Link } from 'react-router-dom';**

**import '../App.css';**

**const AboutPage = () => {**

**return (**

**<div>**

**<header>**

**<h1>About Us</h1>**

**<nav>**

**<ul>**

**<li><Link to="/">Home</Link></li>**

**<li><Link to="/about">About Us</Link></li>**

**<li><Link to="/services">Services</Link></li>**

**<li><Link to="/contact">Contact</Link></li>**

**<li><Link to="/booking">Book a Ride</Link></li>**

**</ul>**

**</nav>**

**</header>**

**<main>**

**<section className="about">**

**<h2>Welcome to BookATaxi</h2>**

**<p>BookATaxi is a leading taxi booking service that aims to provide convenient and reliable transportation solutions to our customers.</p>**

**<p>Our team consists of experienced professionals dedicated to ensuring your safety and comfort during your journey.</p>**

**</section>**

**</main>**

**<footer>**

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**</footer>**

**</div>**

**);**

**};**

**export default AboutPage;**  
  
  
  
**ServicesPage.js  
  
import React from 'react';**

**import { Link } from 'react-router-dom';**

**import '../App.css';**

**const ServicesPage = () => {**

**return (**

**<div>**

**<header>**

**<h1>Our Services</h1>**

**<nav>**

**<ul>**

**<li><Link to="/">Home</Link></li>**

**<li><Link to="/about">About Us</Link></li>**

**<li><Link to="/services">Services</Link></li>**

**<li><Link to="/contact">Contact</Link></li>**

**<li><Link to="/booking">Book a Ride</Link></li>**

**</ul>**

**</nav>**

**</header>**

**<main>**

**<section className="services">**

**<h2>Our Services</h2>**

**<p>BookATaxi offers a range of services to meet your transportation needs:</p>**

**<ul>**

**<li>Point-to-Point Transfer</li>**

**<li>Airport Transfers</li>**

**<li>Hourly Rental</li>**

**<li>City Tours</li>**

**<li>And more...</li>**

**</ul>**

**</section>**

**</main>**

**<footer>**

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**</footer>**

**</div>**

**);**

**};**

**export default ServicesPage;**

**ContactPage.js  
  
import React from 'react';**

**import { Link } from 'react-router-dom';**

**import '../App.css';**

**const ContactPage = () => {**

**return (**

**<div>**

**<header>**

**<h1>Contact Us</h1>**

**<nav>**

**<ul>**

**<li><Link to="/">Home</Link></li>**

**<li><Link to="/about">About Us</Link></li>**

**<li><Link to="/services">Services</Link></li>**

**<li><Link to="/contact">Contact</Link></li>**

**<li><Link to="/booking">Book a Ride</Link></li>**

**</ul>**

**</nav>**

**</header>**

**<main>**

**<section className="contact">**

**<h2>Contact Information</h2>**

**<p>If you have any inquiries or need assistance, feel free to contact us:</p>**

**<ul>**

**<li>Email: info@bookataxi.com</li>**

**<li>Phone: +1 123-456-7890</li>**

**<li>Address: 123 Main Street, City, Country</li>**

**</ul>**

**</section>**

**</main>**

**<footer>**

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**</footer>**

**</div>**

**);**

**};**

**export default ContactPage;**

* 1. Convert the booking.php file by providing the following prompt to GitHub Copilot:  
     **@workspace Now, convert booking.php to React and name it BookingPage**  
       
     A screenshot of a computer

     Description automatically generated  
       
     The generated React script for the **BookingPage.js** is as follows:   
       
     **import React, { useState } from 'react';**

**const BookingPage = () => {**

**const [serviceType, setServiceType] = useState('');**

**const [pickupLocation, setPickupLocation] = useState('');**

**const [dropoffLocation, setDropoffLocation] = useState('');**

**const [pickupDate, setPickupDate] = useState('');**

**const [pickupTime, setPickupTime] = useState('');**

**const [confirmation, setConfirmation] = useState('');**

**// Simulated service types from database**

**const serviceTypes = ['Type 0', 'Type 1', 'Type 2', 'Type 3'];**

**// Handle form submission**

**const handleSubmit = (event) => {**

**event.preventDefault();**

**// Process form data here**

**// For example, send a POST request to your server**

**// ...**

**// Simulate complex data processing**

**const processedServiceType = serviceType.toUpperCase();**

**const processedPickupLocation = pickupLocation.replace(/ /g, '-');**

**const processedDropoffLocation = dropoffLocation.replace(/ /g, '-');**

**// Set confirmation message**

**const confirmationMessage = (**

**<>**

**<h2>Your booking has been confirmed!</h2>**

**<p>Thank you for choosing our service. Your ride details are as follows:</p>**

**<ul>**

**<li><strong>Service Type:</strong> {processedServiceType}</li>**

**<li><strong>Pickup Location:</strong> {processedPickupLocation}</li>**

**<li><strong>Dropoff Location:</strong> {processedDropoffLocation}</li>**

**<li><strong>Pickup Date:</strong> {pickupDate}</li>**

**<li><strong>Pickup Time:</strong> {pickupTime}</li>**

**</ul>**

**</>**

**);**

**setConfirmation(confirmationMessage);**

**};**

**return (**

**<div className="BookingPage">**

**<header>**

**<h1>Book a Ride</h1>**

**<nav>**

**<ul>**

**<li><a href="/">Home</a></li>**

**<li><a href="/about">About Us</a></li>**

**<li><a href="/services">Services</a></li>**

**<li><a href="/contact">Contact</a></li>**

**<li><a href="/booking">Book a Ride</a></li>**

**</ul>**

**</nav>**

**</header>**

**<main>**

**<section className="booking-form">**

**<h2>Book a Ride with BookATaxi</h2>**

**<form onSubmit={handleSubmit}>**

**<label htmlFor="service-type">Select Service Type:</label>**

**<select name="service-type" id="service-type" required onChange={(e) => setServiceType(e.target.value)}>**

**{serviceTypes.map((type, index) => (**

**<option key={index} value={type}>{type}</option>**

**))}**

**</select>**

**<label htmlFor="pickup-location">Pickup Location:</label>**

**<input type="text" name="pickup-location" id="pickup-location" required onChange={(e) => setPickupLocation(e.target.value)} />**

**<label htmlFor="dropoff-location">Dropoff Location:</label>**

**<input type="text" name="dropoff-location" id="dropoff-location" required onChange={(e) => setDropoffLocation(e.target.value)} />**

**<label htmlFor="pickup-date">Pickup Date:</label>**

**<input type="date" name="pickup-date" id="pickup-date" required onChange={(e) => setPickupDate(e.target.value)} />**

**<label htmlFor="pickup-time">Pickup Time:</label>**

**<input type="time" name="pickup-time" id="pickup-time" required onChange={(e) => setPickupTime(e.target.value)} />**

**<button type="submit">Book Now</button>**

**</form>**

**</section>**

**</main>**

**{confirmation && (**

**<div className="confirmation">**

**{confirmation}**

**</div>**

**)}**

**<footer>**

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**</footer>**

**</div>**

**);**

**};**

**export default BookingPage;**

* 1. Navigate to the React project, create a folder named components, and inside the components folder, create **AboutPage.js**, **BookingPage.js**, **ContactPage.js**, **HomePage.js**, **ServicesPage.js** files, as shown in the screenshot below:  
       
     A screenshot of a computer

     Description automatically generated
  2. Copy all the generated scripts and paste them into the **components** folder, as shown in the screenshots below:  
       
     A screenshot of a computer program

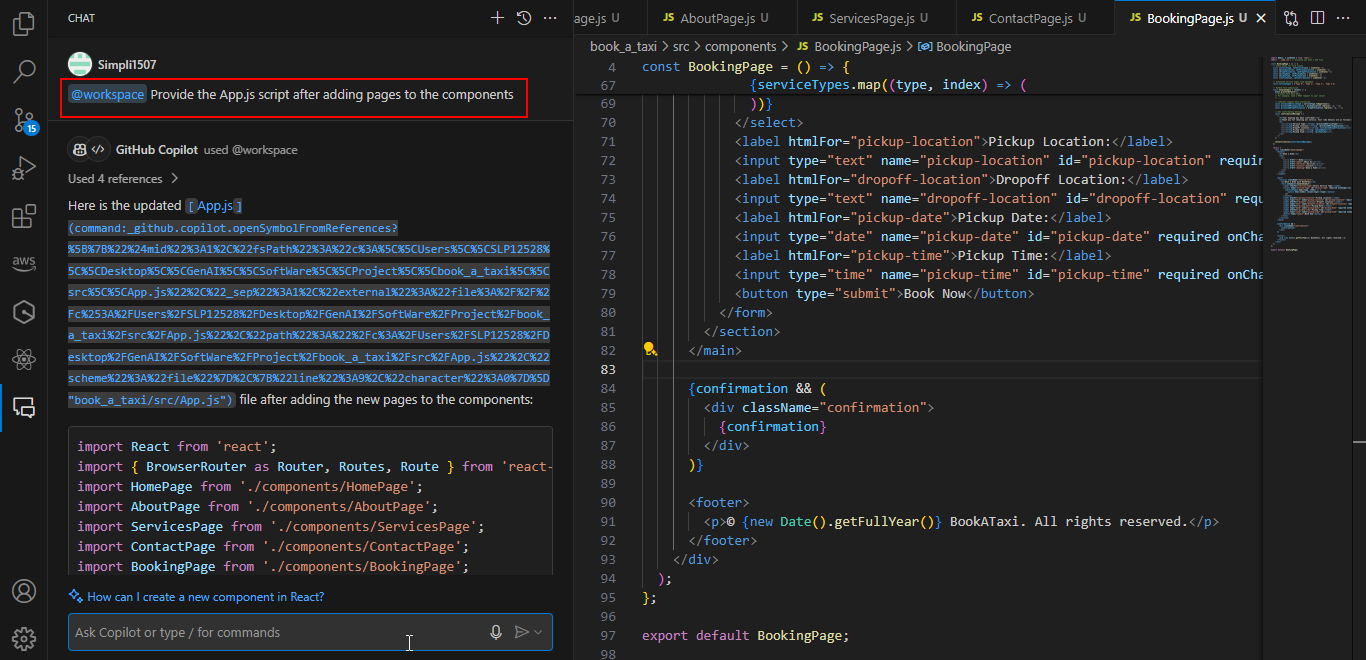
     Description automatically generated  
       
     A screenshot of a computer program

     Description automatically generated  
     A screenshot of a computer program

     Description automatically generated  
       
     A screenshot of a computer

     Description automatically generated   
       
     A screenshot of a computer program

     Description automatically generated

1. **Implement routing in the React project**
   1. Open the created **book\_a\_taxi** React project in Visual Studio Code and enter the following prompt to update the **App.js** file:  
      **@workspace Provide the App.js script after adding pages to the components**  
        
        
        
      A screenshot of a computer program

      Description automatically generated

The generated React script for the **App.js** is as follows:  
  
**import React from 'react';**

**import { BrowserRouter as Router, Routes, Route } from 'react-router-dom';**

**import HomePage from './components/HomePage';**

**import AboutPage from './components/AboutPage';**

**import ServicesPage from './components/ServicesPage';**

**import ContactPage from './components/ContactPage';**

**import BookingPage from './components/BookingPage';**

**const App = () => {**

**return (**

**<Router>**

**<Routes>**

**<Route path="/" element={<HomePage />} />**

**<Route path="/about" element={<AboutPage />} />**

**<Route path="/services" element={<ServicesPage />} />**

**<Route path="/contact" element={<ContactPage />} />**

**<Route path="/booking" element={<BookingPage />} />**

**</Routes>**

**</Router>**

**);**

**};**

**export default App;**

* 1. Copy and paste the generated script into the **App.js** file, as shown in the screenshot below:  
       
     A screenshot of a computer

     Description automatically generated

1. **Test React components and functionalities for optimal performance**
   1. Install React Router DOM using the following command:  
        
      A screenshot of a computer program

      Description automatically generated
   2. Run the React application using the following command:  
      **npm start**  
        
      A screenshot of a computer

      Description automatically generated

A screenshot of a computer

Description automatically generated  
  
  
You will see the output as follows:  
  
A screenshot of a taxi

Description automatically generated

1. **Optimize the time and space complexity of PHP files using GitHub Copilot**
   1. Enter the following prompt in the PHP project to analyze the time and space complexity:  
      **@workspace Analyze the time and space complexity of this project**A screenshot of a computer

      Description automatically generatedThe analysis focuses on the **booking.php** page, determining that its time and space complexity is **O(n^2)**.
   2. Navigate to the React project and analyze the time and space complexity for the React components using the following prompt:  
      **@workspace Analyze the time and space complexity of all components in this React application**  
        
      A screenshot of a computer program

      Description automatically generated  
        
      The time and space complexity in the React application are expressed in Big O notation. It shows that the time and space complexity are improved in the React application.
   3. Optimize the time and space complexity of the React application further using the following prompt:  
      **@workspace Improve the time and space complexity of all components in this React application  
        
      A screenshot of a computer

      Description automatically generated**

**A screenshot of a computer screen

Description automatically generated**

By following these steps, you have successfully transitioned a PHP project into a fully functional React application, integrating modern web technologies and improving both usability and performance.