



# **MIT Art, Design and Technology University MIT School of Computing, Pune**

**Department of Information Technology**

**SUBJECT – FULL STACK FRONT END DEVELOPMENT**

**COURSE CODE – 23IT3001**

**Class – T.Y. SMAD**

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**A.Y. 2025-2026 ( SEM – I )**

## Assignment 1 : Bootstrap Homepage

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### Aim :

To design and develop a **responsive static homepage** using the **Bootstrap framework**. The goal is to understand how Bootstrap simplifies front-end design through pre-defined classes, grid systems, and responsive utilities. The homepage will demonstrate the use of major Bootstrap components such as containers, navigation bars, buttons, and responsive grids to create a visually appealing layout adaptable to any device.

### Theory :

#### 1. All About Bootstrap

**Bootstrap is a powerful front-end framework used to build responsive and mobile-first web pages. It offers pre-defined CSS and JavaScript components that simplify layout creation, ensuring consistency and responsiveness without extensive custom CSS.**

**Bootstrap's 12-column grid system is the core of its design structure. It allows developers to align text, images, and sections systematically while automatically adjusting layouts across screen sizes. For example, a three-column layout on a desktop can automatically convert into a single-column layout on mobile.**

A homepage serves as an introduction to a website or web app, typically featuring sections like:

- **Navbar:** built using `navbar` and `navbar-expand-lg` classes for responsive navigation.
- **Hero/Jumbotron:** the first visual section, using `bg-primary`, `text-center`, and padding utilities to highlight key content.
- **Features Grid:** implemented using `row` and `col-md-*` classes for structured feature display.
- **Footer:** built with background color, spacing, and text utilities to ensure readability and professional finish.

Bootstrap also follows a mobile-first approach, meaning styles are optimized for smaller screens first and then enhanced for larger ones using responsive breakpoints (`sm`, `md`, `lg`, `xl`).

By leveraging Bootstrap's utility classes, developers can easily add spacing (`p-3`, `mt-5`), text alignment (`text-center`), colors (`bg-dark`, `text-light`), and responsive visibility options — all without writing manual CSS.

**In this assignment, we use Bootstrap to design a static homepage with a navbar, hero section, feature cards, call-to-action, and footer. The result is a fully responsive, elegant homepage that can serve as a base for dynamic applications.**

**Code :**

```
<!DOCTYPE html>

<html lang="en">
<head>
  <meta charset="UTF-8" />
  <meta name="viewport" content="width=device-width, initial-scale=1.0" />
  <title>Bootstrap Static Homepage</title>

  <!-- Bootstrap CSS -->
  <link
    href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/css/bootstrap.min.css"
    rel="stylesheet"
  />

  <!-- Custom CSS -->
  <style>
    body {
      font-family: 'Poppins', sans-serif;
      scroll-behavior: smooth;
      display: flex;
      flex-direction: column;
      min-height: 100vh;
    }

    main {
      flex: 1;
    }
  </style>

```

```

.hero {
  background: linear-gradient(90deg, #007bff, #00b4d8);
  color: white;
  padding: 120px 20px;
}

.feature-icon {
  font-size: 40px;
  color: #007bff;
}

footer {
  background-color: #212529;
  color: white;
  padding: 20px 0;
  text-align: center;
  margin-top: auto;
}

.navbar-brand {
  font-weight: 600;
  letter-spacing: 0.5px;
}

</style>
</head>

<body>
  <!-- Navbar -->
  <nav class="navbar navbar-expand-lg navbar-dark bg-dark fixed-top shadow-sm">
    <div class="container">
      <a class="navbar-brand" href="#">My Bootstrap App</a>
      <button class="navbar-toggler" type="button" data-bs-toggle="collapse" data-bs-target="#navbarNav">
        <span class="navbar-toggler-icon"></span>

```

```

</button>

<div class="collapse navbar-collapse" id="navbarNav">
  <ul class="navbar-nav ms-auto">
    <li class="nav-item"><a class="nav-link active" href="#">Home</a></li>
    <li class="nav-item"><a class="nav-link" href="#">About</a></li>
    <li class="nav-item"><a class="nav-link" href="#">Services</a></li>
    <li class="nav-item"><a class="nav-link" href="#">Contact</a></li>
  </ul>
</div>
</div>
</nav>

```

```

<!-- Hero Section -->
<main>
  <section class="hero text-center">
    <div class="container">
      <h1 class="display-4 fw-bold">Welcome to My Web Application</h1>
      <p class="lead mt-3">
        A modern, responsive homepage built entirely with Bootstrap.
        Designed to look great on all devices — from desktops to smartphones.
      </p>
      <a href="#" class="btn btn-light btn-lg mt-3 fw-bold">Get Started</a>
      <a href="#" class="btn btn-outline-light btn-lg mt-3 fw-bold">Learn More</a>
    </div>
  </section>

```

```

<!-- Features Section -->
<section class="container my-5 py-4">
  <h2 class="text-center mb-5 fw-bold text-primary">Our Features</h2>
  <div class="row text-center">
    <div class="col-md-4 mb-4">
      <div class="p-4 border rounded shadow-sm h-100">

```

```
<div class="feature-icon mb-3">💡</div>
<h5 class="fw-bold">Creative Design</h5>
<p class="text-muted">
    Clean, modern, and fully responsive layouts that ensure the best experience on every device.
</p>
<button class="btn btn-primary">Read More</button>
</div>
</div>

<div class="col-md-4 mb-4">
<div class="p-4 border rounded shadow-sm h-100">
    <div class="feature-icon mb-3">🌐</div>
    <h5 class="fw-bold">Easy Integration</h5>
    <p class="text-muted">
        Built with Bootstrap's grid system, our design integrates seamlessly with any web project.
    </p>
    <button class="btn btn-primary">Read More</button>
</div>
</div>

<div class="col-md-4 mb-4">
<div class="p-4 border rounded shadow-sm h-100">
    <div class="feature-icon mb-3">⚡</div>
    <h5 class="fw-bold">Fast Performance</h5>
    <p class="text-muted">
        Optimized for speed and efficiency, providing smooth interactions and quick loading.
    </p>
    <button class="btn btn-primary">Read More</button>
</div>
</div>
</div>
</section>
```

```

<!-- Call to Action -->

<section class="bg-light py-5">
  <div class="container text-center">
    <h2 class="fw-bold mb-3">Start Building Your Own Website</h2>
    <p class="text-muted mb-4">
      Create professional, mobile-friendly websites using Bootstrap's components and grid system.
    </p>
    <a href="#" class="btn btn-success btn-lg fw-bold">Create Now</a>
  </div>
</section>
</main>

<!-- Footer -->
<footer>
  <div class="container">
    <p class="mb-0">&copy; 2025 My Bootstrap App. All Rights Reserved.</p>
  </div>
</footer>

<!-- Bootstrap JS -->
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/js/bootstrap.bundle.min.js"></script>
</body>
</html>

```

## **Output :**

 DSA Learning

Home About Courses Contact

Cart Login Register

# Master Data Structures & Algorithms

Boost your coding skills with our comprehensive DSA courses. Designed by industry experts to help you ace technical interviews.

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Cart Login Register



**Arrays & Strings**  
Master fundamental data structures and manipulation techniques.

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**Dynamic Programming**  
Learn to solve complex problems efficiently.

[Add to Cart](#)

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 DSA Learning  
Master Data Structures and Algorithms with our comprehensive courses.

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## Conclusion :

We successfully created a Home page with bootstrap.

---

## Assignment 2 : Bootstrap Grid

---

### Aim :

The aim of this assignment is to design a **responsive, multi-column information page** using **Bootstrap's 12-column grid system**.

The layout demonstrates consistent alignment, uniform spacing, and adaptability across different screen sizes, showcasing how Bootstrap's grid enables scalable and maintainable structures without the need for custom media queries or heavy CSS.

### Theory :

Bootstrap's **grid system** is the foundation of responsive web design in modern front-end development. It divides the page into a **12-column flexible structure**, allowing developers to arrange and align content efficiently.

In this assignment, the grid system is used to create a **multi-column card-based layout** that dynamically adjusts based on screen width:

- **Large screens ( $\geq 992\text{px}$ ):** 3 cards per row (col-lg-4)
- **Medium screens ( $\geq 768\text{px}$ ):** 2 cards per row (col-md-6)
- **Small screens ( $< 768\text{px}$ ):** 1 card per row (auto stacking)

The **container** class centers the page content and adds horizontal padding. Inside it, **rows** and **columns** organize the cards neatly, while the **g-4** class provides uniform spacing (gutters) between columns.

Each **card** uses Bootstrap's built-in classes:

- card, card-img-top, and card-body to define structure.
- shadow-sm, border-0, and rounded to enhance appearance.
- Utility classes like text-muted, fw-bold, and btn-outline-primary to maintain visual hierarchy and clarity.

A **header section** introduces the page using typography and color utilities, while the **footer** provides contrast with bg-dark and text-white classes.

This assignment highlights how Bootstrap's **mobile-first philosophy** automatically scales layouts using predefined breakpoints, removing the need for manual media queries. The result is a clean, professional, and easily maintainable layout adaptable to all devices.

```

Code : <!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8" />
<meta name="viewport" content="width=device-width, initial-scale=1.0" />
<title>Bootstrap Grid-Based Information Page</title>

<!-- Bootstrap CSS -->
<link
  href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/css/bootstrap.min.css"
  rel="stylesheet"
/>

<!-- Custom Styles -->
<style>
body {
  font-family: 'Poppins', sans-serif;
  background-color: #f8f9fa;
  margin: 0;
  padding: 0;
}

.page-header {
  background: linear-gradient(90deg, #0d6efd, #00b4d8);
  color: white;
  padding: 70px 0;
  text-align: center;
  box-shadow: 0 3px 10px rgba(0, 0, 0, 0.2);
}

.page-header h1 {
  font-weight: 700;
}

```

```
}

.card img {
    height: 200px;
    object-fit: cover;
    border-top-left-radius: 6px;
    border-top-right-radius: 6px;
}

footer {
    background-color: #212529;
    color: #fff;
    text-align: center;
    padding: 20px 0;
    margin-top: 40px;
}

</style>
</head>

<body>
    <!-- Header Section -->
    <header class="page-header mb-5">
        <div class="container">
            <h1 class="fw-bold">Our Featured Articles</h1>
            <p class="lead mb-0">
                Explore the latest insights, blogs, and curated resources designed for you.
            </p>
        </div>
    </header>

    <!-- Grid Section -->
    <main class="container mb-5">
```

```

<div class="row g-4">
  <!-- Card 1 -->
  <div class="col-lg-4 col-md-6">
    <div class="card shadow-sm border-0 h-100">
      
      <div class="card-body">
        <h5 class="card-title fw-bold text-primary">Healthy Living Tips</h5>
        <p class="card-text text-muted">
          Discover effective ways to maintain a healthy lifestyle through a balanced diet and regular exercise.
        </p>
        <a href="#" class="btn btn-outline-primary btn-sm">Read More</a>
      </div>
    </div>
  </div>

  <!-- Card 2 -->
  <div class="col-lg-4 col-md-6">
    <div class="card shadow-sm border-0 h-100">
      
      <div class="card-body">
        <h5 class="card-title fw-bold text-primary">Mental Health Awareness</h5>
        <p class="card-text text-muted">
          Learn how to manage stress, anxiety, and improve emotional well-being through mindfulness.
        </p>
        <a href="#" class="btn btn-outline-primary btn-sm">Read More</a>
      </div>
    </div>
  </div>

  <!-- Card 3 -->
  <div class="col-lg-4 col-md-6">

```

```
<div class="card shadow-sm border-0 h-100">
  
  <div class="card-body">
    <h5 class="card-title fw-bold text-primary">Technology in Healthcare</h5>
    <p class="card-text text-muted">
      Explore how AI and IoT are transforming healthcare systems and improving patient experiences.
    </p>
    <a href="#" class="btn btn-outline-primary btn-sm">Read More</a>
  </div>
</div>
</div>
</div>
```

```
<!-- Card 4 -->
<div class="col-lg-4 col-md-6">
  <div class="card shadow-sm border-0 h-100">
    
    <div class="card-body">
      <h5 class="card-title fw-bold text-primary">Nutrition and Immunity</h5>
      <p class="card-text text-muted">
        Learn how proper nutrition strengthens immunity and helps prevent common illnesses.
      </p>
      <a href="#" class="btn btn-outline-primary btn-sm">Read More</a>
    </div>
  </div>
</div>
</div>
```

```
<!-- Card 5 -->
<div class="col-lg-4 col-md-6">
  <div class="card shadow-sm border-0 h-100">
    
    <div class="card-body">
```

```

<h5 class="card-title fw-bold text-primary">Fitness and Motivation</h5>
<p class="card-text text-muted">
  Stay inspired with fitness challenges, expert tips, and motivation strategies.
</p>
<a href="#" class="btn btn-outline-primary btn-sm">Read More</a>
</div>
</div>
</div>

```

```

<!-- Card 6 -->
<div class="col-lg-4 col-md-6">
  <div class="card shadow-sm border-0 h-100">
    
    <div class="card-body">
      <h5 class="card-title fw-bold text-primary">Sleep and Recovery</h5>
      <p class="card-text text-muted">
        Understand how quality sleep enhances recovery, energy, and overall wellness.
      </p>
      <a href="#" class="btn btn-outline-primary btn-sm">Read More</a>
    </div>
    </div>
  </div>
</div>
</div>
</main>

```

```

<!-- Footer -->
<footer>
  <p class="mb-0">&copy; 2025 Grid Information Page | Designed by Samyak Kedari</p>
</footer>

```

```

<!-- Bootstrap JS -->
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/js/bootstrap.bundle.min.js"></script>

```

```
</body>
```

```
</html>
```

## Output :

The screenshot shows a website for 'DSA Learning'. At the top, there's a dark header bar with the logo 'DSA Learning' and navigation links for 'Home', 'About', 'Courses', and 'Contact'. On the right side of the header are 'Login' and 'Register' buttons. Below the header, the main content area has a title 'Why Choose Us?' followed by a subtitle 'Comprehensive learning experience for all skill levels'. There are three cards in a row under this section: 'Interactive Coding' (blue icon), 'Progress Tracking' (green icon), and 'Interview Prep' (yellow icon). Each card has a brief description below its icon. Below this section is a heading 'Popular Courses' with two blurred course thumbnails underneath.

## Conclusion :

We successfully implemented **Bootstrap's 12-column grid system** to create a responsive multi-column information page.

This assignment demonstrates how Bootstrap simplifies layout design through containers, rows, and columns, ensuring a visually balanced and scalable structure across all devices.

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## **Assignment 3 : Bootstrap form and table**

---

### **Aim :**

The aim of this assignment is to integrate Bootstrap's form and table components into web layouts to create professional, user-friendly interfaces for checkout and profile sections.

The objective is to apply classes such as form-group, form-control, and validation utilities to ensure proper form structure and data validation.

Additionally, Bootstrap tables are used to display cart details and order history with features like striped rows, borders, and responsive layouts, demonstrating how Bootstrap's responsive utilities can unify form-based inputs and data presentation seamlessly.

### **Theory :**

Bootstrap simplifies form and table design by providing pre-styled, responsive components that maintain alignment, spacing, and structure across devices. In this assignment, the Checkout and Profile forms were redesigned using Bootstrap's form classes to ensure a consistent and user-friendly interface. Likewise, Cart and Order History data were displayed using Bootstrap's table system for better readability and professional presentation.

The Checkout Form utilizes components such as form-group, form-control, and form-row to arrange inputs in an organized structure. Bootstrap's grid system divides form fields into responsive columns, ensuring they appear side by side on large screens and stack vertically on smaller screens. The form-control class standardizes the appearance of all input elements like text boxes, dropdowns, and date selectors. To enhance user experience, validation feedback was implemented using invalid-feedback, which prompts the user when a required field is missing or incorrectly filled. The needs-validation and was-validated classes are part of Bootstrap's built-in validation framework, providing a visual indication of correct or incorrect entries without writing custom JavaScript for field checking.

The Profile Form demonstrates Bootstrap's utility for creating visually consistent data entry interfaces. Labels and input fields are uniformly aligned using the same grid and spacing principles. This structure helps maintain a cohesive user experience across all forms in a web application, ensuring that different sections like personal details or contact information follow the same design language.

The Cart Table and Order History Table showcase Bootstrap's capability to display data in a clear and responsive format. The table class defines the basic table structure, while additional classes like table-striped, table-bordered, and table-hover enhance readability and visual hierarchy. The table-responsive wrapper ensures that the tables remain scrollable on smaller devices, preventing content overflow. Using contextual classes like table-dark, table-

primary, and badge adds color coding to highlight important information such as order status— making the layout both informative and visually engaging.

By combining forms and tables, this assignment demonstrates how Bootstrap achieves balance between input design and data presentation. Developers can maintain uniform margins, paddings, and alignments without writing custom CSS. The responsive design adapts automatically, guaranteeing that both forms and tables remain functional and elegant across all device sizes.

Overall, Bootstrap's component-based system not only reduces design complexity but also accelerates development by providing pre-tested patterns for form handling, validation, and tabular layouts. The forms guide users smoothly through input processes, while tables provide structured access to dynamic data such as cart items and order summaries.

**Code :**

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8" />
  <meta name="viewport"
        content="width=device-width, initial-scale=1.0"
        />
  <title>Bootstrap Form and Table
  Integration</title>

  <!-- Bootstrap CSS -->
  <link
    href="https://cdn.jsdelivr.net/npm/bootstrap@5
    .3.3/dist/css/bootstrap.min.css"
    rel="stylesheet">

<style>
  body {
    font-family: 'Poppins', sans-serif;
    background-color: #f8f9fa;
  }
  .section-title {
    text-align: center;
    margin-top: 40px;
    margin-bottom: 25px;
    font-weight: 600;
    color: #0d6efd;
  }
</style>
</head>

<body>
  <div class="container my-5">

    <!-- Checkout Form -->
    <h2 class="section-title">Checkout
    Form</h2>
    <form class="shadow p-4 rounded bg-white
    needs-validation" novalidate>
      <div class="row mb-3">
        <div class="col-md-6">
          <label class="form-label">Full
          Name</label>
        </div>
      </div>
    </form>
  </div>
</body>
```

```

<input type="text" class="form-control" required>

<div class="invalid-feedback">Please enter your full name.</div>

</div>

<div class="col-md-6">
  <label class="form-label">Email</label>
  <input type="email" class="form-control" required>
  <div class="invalid-feedback">Please enter a valid email address.</div>
</div>

</div>

<div class="row mb-3">
  <div class="col-md-6">
    <label class="form-label">Address</label>
    <input type="text" class="form-control" required>
    <div class="invalid-feedback">Please enter your shipping address.</div>
  </div>
  <div class="col-md-6">
    <label class="form-label">City</label>
    <input type="text" class="form-control" required>
    <div class="invalid-feedback">Please enter your city.</div>
  </div>
</div>

<div class="row mb-3">
  <div class="col-md-6">
    <label class="form-label">Pincode</label>

```

```

<input type="text" class="form-control" required>

<div class="invalid-feedback">Please enter your pincode.</div>
</div>

<div class="col-md-6">
  <label class="form-label">Payment Mode</label>
  <select class="form-select" required>
    <option selected disabled>Choose...</option>
    <option>Credit Card</option>
    <option>Debit Card</option>
    <option>UPI</option>
    <option>Cash on Delivery</option>
  </select>
  <div class="invalid-feedback">Please select a payment mode.</div>
</div>
</div>
```

```

<button type="submit" class="btn btn-success w-100 fw-bold mt-3">Place Order</button>
</form>
```

```

<!-- Profile Form -->
<h2 class="section-title mt-5">User Profile Form</h2>
<form class="shadow p-4 rounded bg-white">
  <div class="row mb-3">
    <div class="col-md-6">
      <label class="form-label">First Name</label>
```

```

<input type="text" class="form-control">
</div>

<div class="col-md-6">
  <label class="form-label">Last
Name</label>
  <input type="text" class="form-control">
</div>
</div>

<div class="row mb-3">
  <div class="col-md-6">
    <label class="form-label">Email</label>
    <input type="email" class="form-control">
  </div>
  <div class="col-md-6">
    <label class="form-label">Phone</label>
    <input type="text" class="form-control">
  </div>
</div>

<div class="row mb-3">
  <div class="col-md-6">
    <label class="form-label">Date of
Birth</label>
    <input type="date" class="form-control">
  </div>
  <div class="col-md-6">
    <label class="form-label">Occupation</label>
    <input type="text" class="form-control">
  </div>
</div>

</div>
</div>

<button class="btn btn-primary w-100 fw-
bold mt-2">Update Profile</button>
</form>

<!-- Cart Table -->
<h2 class="section-title mt-5">Cart
Summary</h2>
<div class="table-responsive shadow
rounded">
  <table class="table table-striped table-
bordered align-middle">
    <thead class="table-dark">
      <tr>
        <th>Product</th>
        <th>Price (₹)</th>
        <th>Quantity</th>
        <th>Total (₹)</th>
      </tr>
    </thead>
    <tbody>
      <tr>
        <td>Paracetamol</td>
        <td>40</td>
        <td>2</td>
        <td>80</td>
      </tr>
      <tr>
        <td>Vitamin C Tablets</td>
        <td>120</td>
        <td>1</td>
        <td>120</td>
      </tr>
    </tbody>
  </table>
</div>

```

```

</tr>
<tr>
  <td>Hand Sanitizer</td>
  <td>60</td>
  <td>3</td>
  <td>180</td>
</tr>
</tbody>
</table>
</div>

<!-- Order History Table --&gt;
&lt;h2 class="section-title mt-5"&gt;Order History&lt;/h2&gt;
&lt;div class="table-responsive shadow rounded"&gt;
  &lt;table class="table table-hover table-bordered align-middle"&gt;
    &lt;thead class="table-primary"&gt;
      &lt;tr&gt;
        &lt;th&gt;Order ID&lt;/th&gt;
        &lt;th&gt;Date&lt;/th&gt;
        &lt;th&gt;Total Amount (₹)&lt;/th&gt;
        &lt;th&gt;Status&lt;/th&gt;
      &lt;/tr&gt;
    &lt;/thead&gt;
    &lt;tbody&gt;
      &lt;tr&gt;
        &lt;td&gt;#1021&lt;/td&gt;
        &lt;td&gt;2025-10-02&lt;/td&gt;
        &lt;td&gt;420&lt;/td&gt;
        &lt;td&gt;&lt;span class="badge bg-success"&gt;Delivered&lt;/span&gt;&lt;/td&gt;
      &lt;/tr&gt;
      &lt;tr&gt;
        &lt;td&gt;#1022&lt;/td&gt;
        &lt;td&gt;2025-10-15&lt;/td&gt;
        &lt;td&gt;250&lt;/td&gt;
        &lt;td&gt;&lt;span class="badge bg-warning text-dark"&gt;In Progress&lt;/span&gt;&lt;/td&gt;
      &lt;/tr&gt;
      &lt;tr&gt;
        &lt;td&gt;#1023&lt;/td&gt;
        &lt;td&gt;2025-10-28&lt;/td&gt;
        &lt;td&gt;180&lt;/td&gt;
        &lt;td&gt;&lt;span class="badge bg-danger"&gt;Cancelled&lt;/span&gt;&lt;/td&gt;
      &lt;/tr&gt;
    &lt;/tbody&gt;
  &lt;/table&gt;
&lt;/div&gt;
&lt;/div&gt;

&lt;!-- Bootstrap JS --&gt;
&lt;script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.3/dist/js/bootstrap.bundle.min.js"&gt;&lt;/script&gt;

&lt;!-- Validation Script --&gt;
&lt;script&gt;
  () =&gt; {
    'use strict';
    const forms =
      document.querySelectorAll('.needs-validation');
    Array.from(forms).forEach((form) =&gt; {
      form.addEventListener('submit', (event)
=&gt; {
        if (!form.checkValidity()) {
          event.preventDefault();
        }
      });
    });
  };
&lt;/script&gt;
</pre>

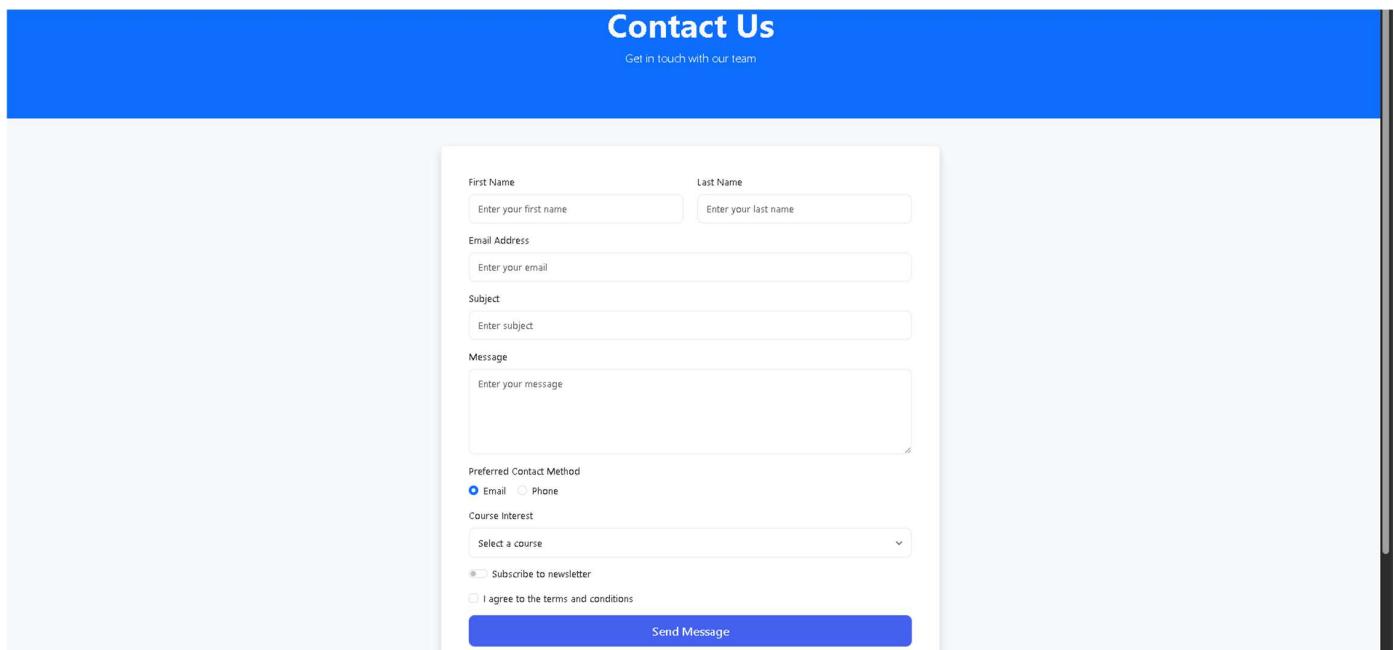
```

```

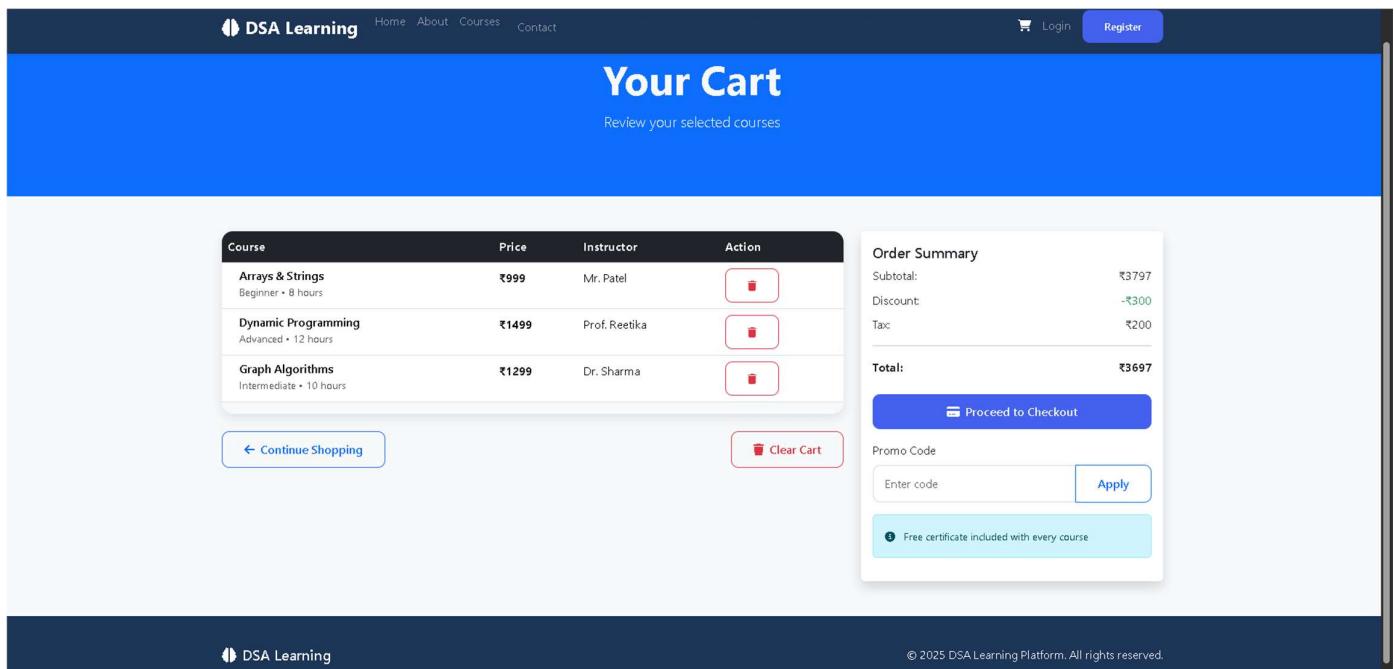
event.stopPropagation();
}
form.classList.add('was-validated');
}, false);
});
}0;

```

**Output :**



The screenshot shows a contact form titled "Contact Us" with a blue header. Below the header, a sub-header says "Get in touch with our team". The form fields include "First Name" and "Last Name" (both with placeholder text "Enter your first name" and "Enter your last name"), "Email Address" (placeholder "Enter your email"), "Subject" (placeholder "Enter subject"), and a large "Message" area (placeholder "Enter your message"). Below these are sections for "Preferred Contact Method" (radio buttons for "Email" and "Phone", with "Email" selected), "Course Interest" (dropdown menu "Select a course" showing "DSA Fundamentals"), and checkboxes for "Subscribe to newsletter" and "I agree to the terms and conditions". A blue "Send Message" button is at the bottom.



The screenshot shows a "Your Cart" page with a blue header. The header includes the DSA Learning logo, navigation links for Home, About, Courses, and Contact, and user links for Login and Register. The main title "Your Cart" is centered above a sub-header "Review your selected courses". The cart table lists three courses:

Course	Price	Instructor	Action
Arrays & Strings Beginner • 8 hours	₹999	Mr. Patel	
Dynamic Programming Advanced • 12 hours	₹1499	Prof. Reetika	
Graph Algorithms Intermediate • 10 hours	₹1299	Dr. Sharma	

Below the table are buttons for "[Continue Shopping](#)" and "[Clear Cart](#)". To the right is an "Order Summary" section with a table:

Subtotal:	₹3797
Discount:	-₹300
Tax:	₹200
Total:	₹3697

Below the summary are buttons for "[Proceed to Checkout](#)", a "Promo Code" input field with an "Apply" button, and a note about free certificates.

## **Conclusion :**

We successfully implemented Bootstrap forms and tables, demonstrating how Bootstrap ensures:

- Responsive layouts
- Consistent styling
- Built-in validation
- Readable and visually appealing data presentation

## Assignment 4 : Responsive Design Using Bootstrap

---

### Aim :

To design and develop a **responsive web layout** using **Bootstrap framework** that automatically adjusts its layout and elements according to different screen sizes (desktop, tablet, and mobile).

### Theory :

#### Introduction

**Responsive design ensures that a website adapts its layout and styling based on the device's screen size, providing an optimal viewing experience.** In this report, we analyze Wikipedia's website across different screen widths using Chrome DevTools to identify the breakpoints at which significant layout changes occur.

---

### Methodology

1. **Tool Used: Chrome DevTools (Responsive Design Mode).**
  2. **Process:**
    - o Opened Wikipedia's *Wiki* page.
    - o Enabled Responsive Mode in DevTools.
    - o Gradually adjusted the viewport width.
    - o Recorded each breakpoint where noticeable layout or style changes occurred.
  3. **Observation Criteria:**
    - o Sidebar visibility.
    - o Font size adjustments.
    - o Content alignment and column changes.
    - o Navigation bar transformations.
- 

### Findings

#### Breakpoint 1: $\geq 1120\text{px}$

- **Layout: Full desktop grid layout.**
- **Sidebar fully visible with complete menu.**
- **Two-column structure with article content on the right and TOC on the left.**
- **Font and spacing optimized for large displays.**

The screenshot shows the Wikipedia homepage at a width of 1205px. The layout is a standard two-column design. On the left is a sidebar containing a navigation tree for 'Wiki'. The main content area on the right includes a search bar, a language selector, and the main article content. The DevTools sidebar on the right shows the CSS grid structure of the page.

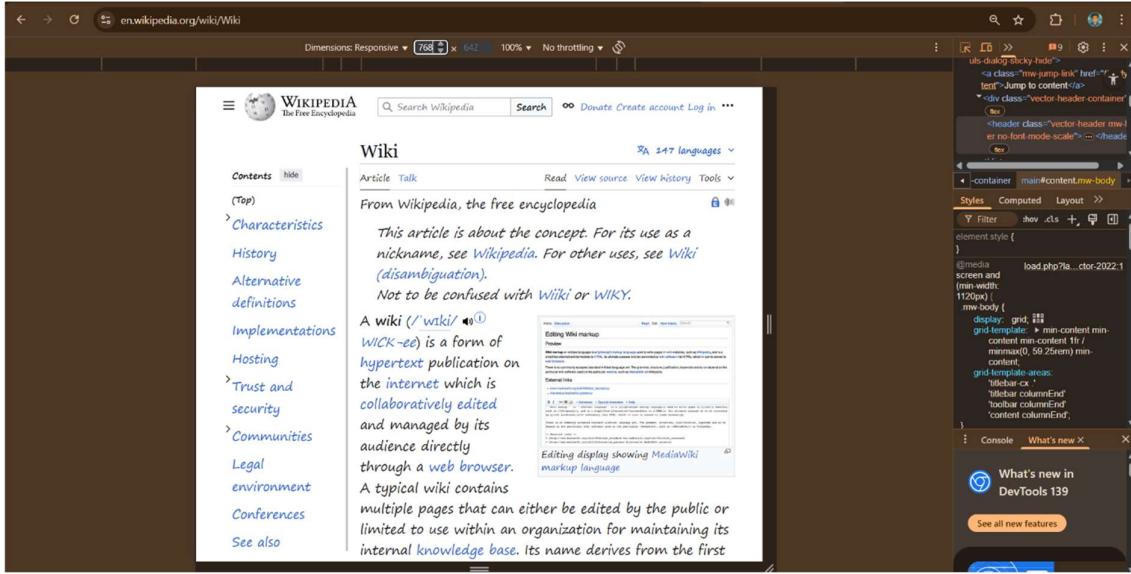
## Breakpoint 2: ~1024px

- Layout Change:** Slightly narrower grid.
- Content area shrinks;** some spacing reduced.
- Still maintains two-column layout.**
- No major element hiding.**

The screenshot shows the Wikipedia homepage at a width of 1024px. The layout remains a two-column design but appears slightly more compact than at 1205px. The sidebar and main content area both have reduced horizontal space. The DevTools sidebar on the right continues to show the grid-based CSS structure.

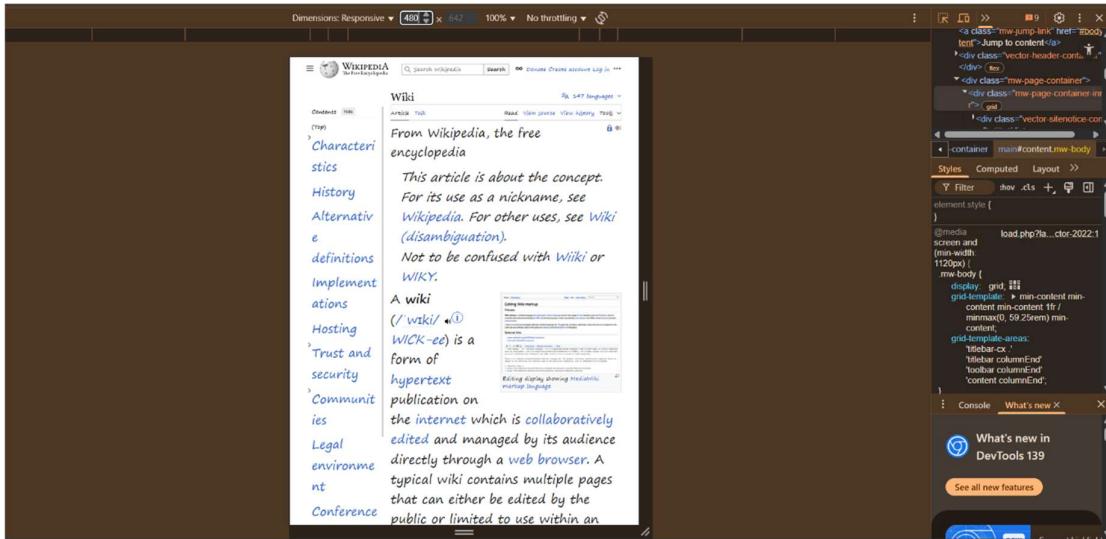
## Breakpoint 3: ~768px

- Layout Change:** Compact two-column view.
- Text and images adapt to narrower width.**
- Table of contents is still present but with tighter spacing.**
- Ideal for small tablets.**



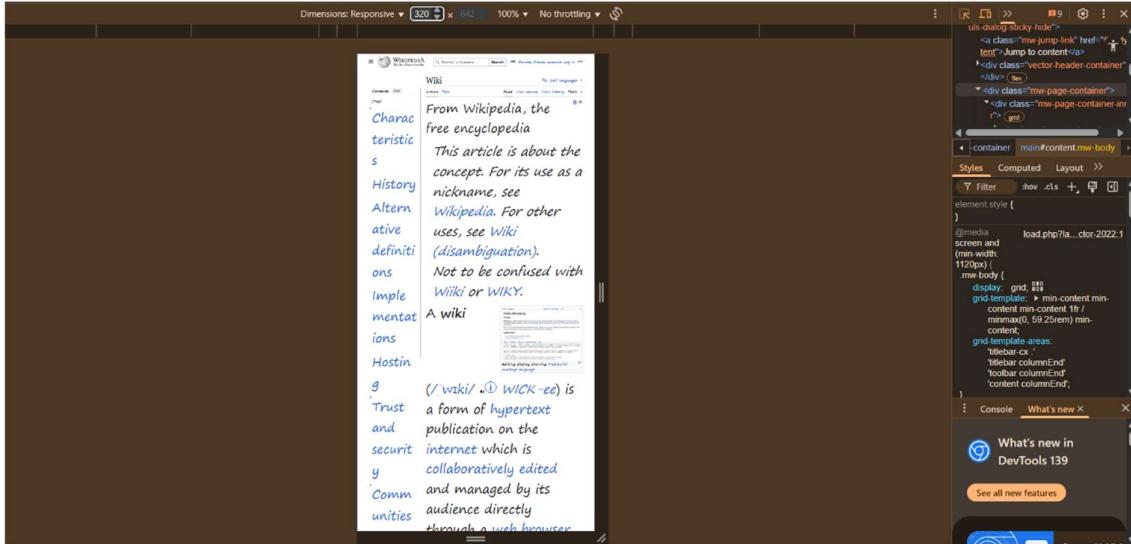
## Breakpoint 4: ~480px

- **Layout Change: Mobile-friendly single-column layout.**
- **Sidebar collapses into a hamburger menu.**
- **Font size slightly increased for readability.**
- **Images shrink proportionally to fit width.**



## Breakpoint 5: ~320px

- **Layout Change: Ultra-compact layout for small mobile screens.**
- **Everything stacks vertically.**
- **Text wraps aggressively; images resize to minimal dimensions.**
- **Navigation minimized for touch interaction.**



## Summary Table

Breakpoint (px)	Layout Characteristics
≥ 1120	Full desktop grid, TOC visible, wide spacing
~1024	Narrow desktop view, reduced spacing
~768	Compact two-column, tighter layout
~480	Single-column mobile view, hamburger menu
~320	Ultra-compact mobile, stacked layout

## Code :

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8" />
```

```
<meta name="viewport" content="width=device-width, initial-scale=1.0" />
<title>Responsive Design Using Bootstrap Grid & Utilities</title>
```

```
<!-- Bootstrap CSS -->
<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/css/bootstrap.min.css" rel="stylesheet"/>
```

```
<style>
body {
    font-family: 'Poppins', sans-serif;
    background-color: #f8f9fa;
}

.demo-section {
    background: #ffffff;
    border-radius: 10px;
    box-shadow: 0 0 10px rgba(0, 0, 0, 0.1);
    padding: 20px;
    margin-bottom: 30px;
}

.demo-box {
    background: #0d6efd;
    color: white;
    text-align: center;
    padding: 40px 10px;
    border-radius: 8px;
}
</style>
```

```
</head>
```

```
<body>
<div class="container my-5">
    <!-- Title -->
    <h1 class="text-center text-primary fw-bold mb-4">
        Responsive Design with Bootstrap Grid & Utilities
    </h1>

```

```
<!-- Grid Demonstration -->
```

```
<section class="demo-section">
    <h4 class="text-secondary fw-bold mb-3">Bootstrap Grid System Example</h4>
    <p class="text-muted">This section demonstrates Bootstrap's 12-column responsive grid layout.</p>
```

```
<div class="row g-3">
    <div class="col-lg-3 col-md-4 col-sm-6"><div class="demo-box">Column 1</div></div>
    <div class="col-lg-3 col-md-4 col-sm-6"><div class="demo-box">Column 2</div></div>
    <div class="col-lg-3 col-md-4 col-sm-6"><div class="demo-box">Column 3</div></div>
    <div class="col-lg-3 col-md-4 col-sm-6"><div class="demo-box">Column 4</div></div>
</div>
</section>
```

```
<!-- Flexbox Alignment Demonstration -->
```

```
<section class="demo-section">
    <h4 class="text-secondary fw-bold mb-3">Flexbox Utilities for Alignment (d-flex, justify-content-*, align-items-*)</h4>
    <p class="text-muted">Bootstrap's flex utilities allow easy alignment and spacing of content horizontally and vertically.</p>
```

```
<div class="d-flex justify-content-around align-items-center flex-wrap bg-light p-4 rounded">
    <div class="demo-box m-2">Start</div>
    <div class="demo-box m-2">Center</div>
    <div class="demo-box m-2">End</div>
</div>
</section>
```

```
<!-- Spacing and Text Utilities -->
```

```
<section class="demo-section">
```

```
<h4 class="text-secondary fw-bold mb-3">Spacing  
and Text Utilities</h4>
```

```
<p class="text-muted">
```

Use Bootstrap's m- (margin), p- (padding), and text-\* classes for structured spacing and text formatting.

```
</p>
```

```
<div class="p-4 bg-light rounded">
```

```
<h5 class="text-center text-primary mb-3">Text  
Utilities Example</h5>
```

```
<p class="text-start m-2"><strong>Left  
Aligned:</strong> This paragraph uses <code>text-  
start</code> and margin utilities.</p>
```

```
<p class="text-center p-2 bg-white rounded  
shadow-sm"><strong>Centered Text:</strong> This  
paragraph uses <code>text-center</code> and padding  
utilities.</p>
```

```
<p class="text-end mt-3 pe-3 text-  
muted"><strong>Right  
Aligned:</strong>  
Demonstrating <code>text-end</code> with padding-  
end.</p>
```

```
</div>
```

```
</section>
```

```
<!-- Responsive Testing Section -->
```

```
<section class="demo-section text-center">  
<h4 class="text-secondary fw-bold mb-  
3">Responsive Behavior Testing</h4>
```

```
<p class="text-muted">
```

Resize the browser window to observe how the grid and flex utilities adapt for mobile, tablet, and desktop.

```
</p>
```

```
<div class="row gy-3">
```

```
<div class="col-lg-6 col-md-12"><div  
class="demo-box">Large Screen (50%)</div></div>
```

```
<div class="col-lg-6 col-md-12"><div  
class="demo-box bg-success">Adapts to Full Width on  
Mobile</div></div>
```

```
</div>
```

```
</section>
```

```
<!-- Footer -->
```

```
<footer class="bg-dark text-white text-center py-3  
rounded mt-5">
```

```
<p class="mb-0">&copy; 2025 Responsive Demo |  
Designed by Samyak Kedari</p>
```

```
</footer>
```

```
</div>
```

```
<!-- Bootstrap JS -->
```

```
<script  
src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.3/dist/  
js/bootstrap.bundle.min.js"></script>
```

```
</body>
```

```
</html>
```

The screenshot shows a responsive web design for a DSA Learning platform. The main content area features a large blue background image of a globe and a city skyline. Overlaid on this is a white text area containing the title "Master Data Structures & Algorithms". Below the title are two buttons: "Start Learning" and "Learn More". The browser's developer tools are open, displaying the HTML structure and the CSS styles applied to the elements.

## Conclusion:

We successfully implemented and tested Responsive Design Using Bootstrap, demonstrating the use of the grid system, flexbox utilities, and spacing classes to create a mobile-first, adaptive webpage layout.

---