# Lab Report 5

Building a dynamic Product Catalog with PhP and MySql

**Course:** CSC381 - E-Commerce

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# 1. Objective

To build a dynamic product catalog using PHP and MySQL, fetch product details from the database, and display them in a responsive, user-friendly layout.

# 2. Tools and Technologies Used

| Technology | Purpose |
| --- | --- |
| HTML5 | Semantic markup and form structure |
| CSS3 | Styling and responsive layouts |
| JavaScript (jQuery) | Client-side validation and interactive features |
| PHP | Server-side logic, form handling, and database operations |
| MySQL | Data storage and management |
| Caddy | Web server |
| Bootstrap 5 | UI design, responsive layout, and component styling |
| VS Code | Development environment |
| Browser DevTools | Debugging and performance testing |

# 3. Theory / Background

A dynamic catalog is generated server-side: PHP executes SQL queries against MySQL to retrieve product rows and renders them into responsive HTML using Bootstrap components. Listing views fetch multiple products (optionally randomized or filtered by brand/category), while detail views retrieve a single product by ID using parameterized queries for safety. Clean rendering relies on escaping output, consistent image paths, and a grid-based layout so products adapt across devices.

# 4. Page Layout Design

## 4.1 Product Listing Grid

- Dynamic fetch of products from MySQL and render as cards.

- Random featured set on home (e.g., 3 items) for variety.

- Clean card layout with image, title, short description, and price.

- Quick actions: Add to Cart and View More per product.

- Responsive grid that adapts from mobile to desktop.

## 4.2 Filtering by Brand and Category

- Sidebar lists brands and categories pulled from the database.

- Clicking a link filters products server-side by selected id.

- Clear "No data found" message when filters return empty.

## 4.3 Product Details Page

- Dedicated page loads product by id using a secure query.

- Shows up to three images, formatted description, and price.

- Displays related info: brand and category labels.

- Includes a back-to-catalog link for easy navigation.

## 4.4 Navigation and Search

- Primary navbar with site name and main links.

- Secondary navbar for welcome/login status.

- Search form submits query to server to list matching products.

## 4.5 Data and Security Practices

- Uses parameterized queries on detail page to prevent injection.

- Escapes output (titles, descriptions, images) to avoid XSS.

- Consistent image directory and clean, structured markup.

# 5. Code Snippets

## 5.1 PHP Function to Retrieve All Products

```php
<?php
function getAllProducts(){
  global $conn;
  if(!isset($_GET['brand']) && !isset($_GET['category']) ){
```

```php
5      $select_query1 = "SELECT * FROM products";
6      $result_query1 = mysqli_query($conn, $select_query1);
7
8      while($row_data1 = mysqli_fetch_assoc($result_query1)){
9        $prod_id = $row_data1['product_id'];
10       $title = htmlspecialchars($row_data1['product_title']);
11       $desc = htmlspecialchars($row_data1['product_description']);
12       $img1 = htmlspecialchars($row_data1['product_image1']);
13       $price = number_format($row_data1['product_price'], 2);
14       $cat_id = $row_data1['category_id'];
15       $brand_id = $row_data1['brand_id'];
16
17       echo
18       "<div class='col-md-4 mb-4'>
19         <div class='card h-100 shadow-sm'>
20           <img src='/admin/product_images/$img1' alt='$title'>
21           <div class='card-body d-flex flex-column'>
22               <h5 class='card-title'>$title</h5>
23               <p class='card-text flex-grow-1'>$desc</p>
24               <p class='text-primary fw-bold fs-5'>NPR $price</p>
25               <div class='mt-auto d-flex'>
26                   <a href='add_to_cart.php?product_id=$prod_id'>
27                       <i class='fa fa-cart-plus me-1'></i> Add To Cart
28                   </a>
29                   <a href='product_details.php?id=$prod_id'>
30                       View More
31                   </a>
32               </div>
33           </div>
34         </div>
35       </div>";
36     }
37   }
38 }
39 ?>
```

## 5.2 PHP Function to Get Product by Brand and Category

```php
1 <?php
2 function getProductByBrand(){
3   global $conn;
4   if(isset($_GET['brand'])){
5     $brand_id = (int)$_GET['brand'];
6     $select_query1 = "SELECT * FROM `products` WHERE brand_id = $brand_id";
7     $result_query1 = mysqli_query($conn, $select_query1);
8     $num_of_rows = mysqli_num_rows($result_query1);
```

```php
9
10        if($num_of_rows == 0){
11            echo "<h2 class='text-center text-danger'>No data is found under
              this brand.</h2>";
12        }
13        while($row_data1 = mysqli_fetch_assoc($result_query1)){
14          $prod_id = $row_data1['product_id'];
15          $title = htmlspecialchars($row_data1['product_title']);
16          $desc = htmlspecialchars($row_data1['product_description']);
17          $img1 = htmlspecialchars($row_data1['product_image1']);
18          $price = number_format($row_data1['product_price'], 2);
19
20          echo
21          "<div class='col-md-4 mb-4'>
22            <div class='card h-100 shadow-sm'>
23              <img src='/admin/product_images/$img1' alt='$title'>
24              <div class='card-body d-flex flex-column'>
25                <h5 class='card-title'>$title</h5>
26                <p class='card-text flex-grow-1'>$desc</p>
27                <p class='text-primary fw-bold fs-5'>NPR $price</p>
28                <div class='mt-auto d-flex'>
29                  <a href='add_to_cart.php?product_id=$prod_id'>
30                    <i class='fa fa-cart-plus'></i> Add To Cart
31                  </a>
32                  <a href='product_details.php?id=$prod_id'>
33                    View More
34                  </a>
35                </div>
36              </div>
37            </div>
38          </div>";
39        }
40      }
41  }
42
43  function getProductByCategory(){
44    global $conn;
45    if(isset($_GET['category'])){
46      $category_id = (int)$_GET['category'];
47      $select_query1 = "SELECT * FROM `products` WHERE category_id =
                        $category_id";
48      $result_query1 = mysqli_query($conn, $select_query1);
49      $num_of_rows = mysqli_num_rows($result_query1);
50
51      if($num_of_rows == 0){
52          echo "<h2 class='text-center text-danger'>No data is found under
                this category.</h2>";
53      }
54      while($row_data1 = mysqli_fetch_assoc($result_query1)){
```

```php
55          $prod_id = $row_data1['product_id'];
56          $title = htmlspecialchars($row_data1['product_title']);
57          $desc = htmlspecialchars($row_data1['product_description']);
58          $img1 = htmlspecialchars($row_data1['product_image1']);
59          $price = number_format($row_data1['product_price'], 2);
60
61          echo
62          "<div class='col-md-4 mb-4'>
63            <div class='card h-100 shadow-sm'>
64              <img src='/admin/product_images/$img1' alt='$title'>
65              <div class='card-body d-flex flex-column'>
66                <h5 class='card-title'>$title</h5>
67                <p class='card-text flex-grow-1'>$desc</p>
68                <p class='text-primary fw-bold fs-5'>NPR $price</p>
69                <div class='mt-auto d-flex'>
70                  <a href='add_to_cart.php?product_id=$prod_id' >
71                    <i class='fa fa-cart-plus'></i> Add To Cart
72                  </a>
73                  <a href='product_details.php?id=$prod_id'>
74                    View More
75                  </a>
76                </div>
77              </div>
78            </div>
79          </div>";
80        }
81      }
82    }
83    ?>
```

## 5.3 PHP  HTML Code: Display All Products

```php
1   <?php
2     <div class="container my-4">
3       <div class="row">
4         <div class="col-md-10">
5           <div class="row g-4">
6             <?php
7               getAllProducts();
8               getProductByBrand();
9               getProductByCategory();
10            ?>
11          </div>
12        </div>
13        <div class="col-md-2 bg-secondary text-white p-3 rounded">
14          <h5 class="text-center bg-info p-2 rounded">Brands</h5>
```

```
15        <ul class="nav flex-column mb-4">
16          <?php getBrands(); ?>
17        </ul>
18        <h5 class="text-center bg-info p-2 rounded">Categories</h5>
19        <ul class="nav flex-column">
20          <?php getCategories(); ?>
21        </ul>
22      </div>
23    </div>
24  </div>
25 ?>
```

## 5.4 PHP Code to Display Product Details

```php
1  <?php
2  include('includes/connect.php');
3  $product_id = isset($_GET['id']) ? intval($_GET['id']) : 0;
4  if ($product_id <= 0) { die("Invalid Product ID."); }
5
6  $stmt = $conn->prepare("SELECT p.product_title, p.product_description,
   p.product_price,
7      p.product_image1, p.product_image2, p.product_image3, b.brand_title,
        c.category_title
8      FROM products p
9      JOIN brands b ON p.brand_id = b.brand_id
10     JOIN categories c ON p.category_id = c.category_id
11     WHERE p.product_id = ? AND p.status = 'true'");
12 $stmt->bind_param("i", $product_id);
13 $stmt->execute();
14 $result = $stmt->get_result();
15
16 if ($result->num_rows === 0) { die("Product not found."); }
17 $product = $result->fetch_assoc();
18 $stmt->close();
19 ?>
20
21 <!DOCTYPE html>
22 <html lang="en">
23 <head>
24     <meta charset="UTF-8" />
25     <title><?= $product['product_title'] ?> - Product Details</title>
26 </head>
27 <body>
28 <div class="container mt-4">
29     <h1><?= htmlspecialchars($product['product_title']) ?></h1>
```

```
30    <p><strong>Brand:</strong> <?=
      htmlspecialchars($product['brand_title']) ?></p>
31    <p><strong>Category:</strong> <?=
      htmlspecialchars($product['category_title']) ?></p>
32    <div class="row mb-4">
33      <div class="col-md-6">
34        <img src="/admin/product_images/<?= $product['product_image1'] ?>">
35        <?php if (!empty($product['product_image2'])): ?>
36        <img src="/admin/product_images/<?= $product['product_image2'] ?>">
37        <?php endif; ?>
38        <?php if (!empty($product['product_image3'])): ?>
39        <img src="/admin/product_images/<?= $product['product_image3'] ?>">
40        <?php endif; ?>
41      </div>
42      <div class="col-md-6">
43        <h3>Price: NPR <?= number_format($product['product_price'], 2);
          ?></h3>
44        <p><?= nl2br(htmlspecialchars($product['product_description']));
          ?></p>
45        <a href="displayAll.php" class="btn">Back</a>
46      </div>
47    </div>
48  </div>
49  </body>
50  </html>
51
```
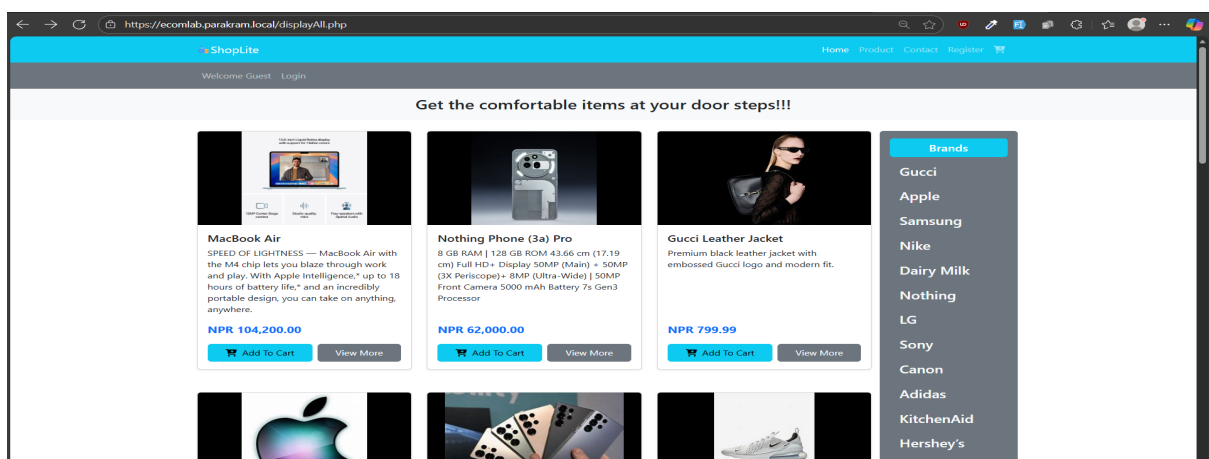
# 6. Output / Screenshots
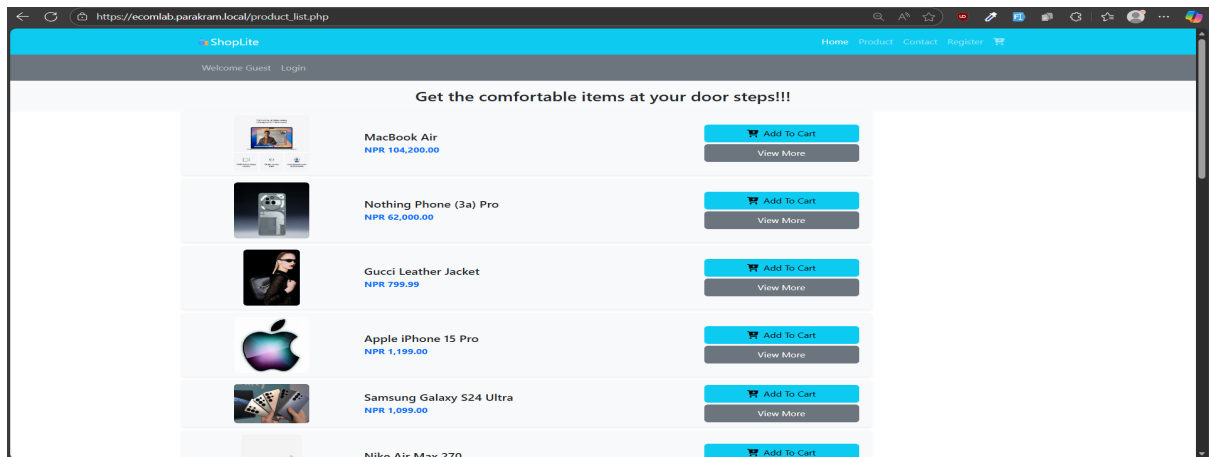


Figure 1: Product Catalog.
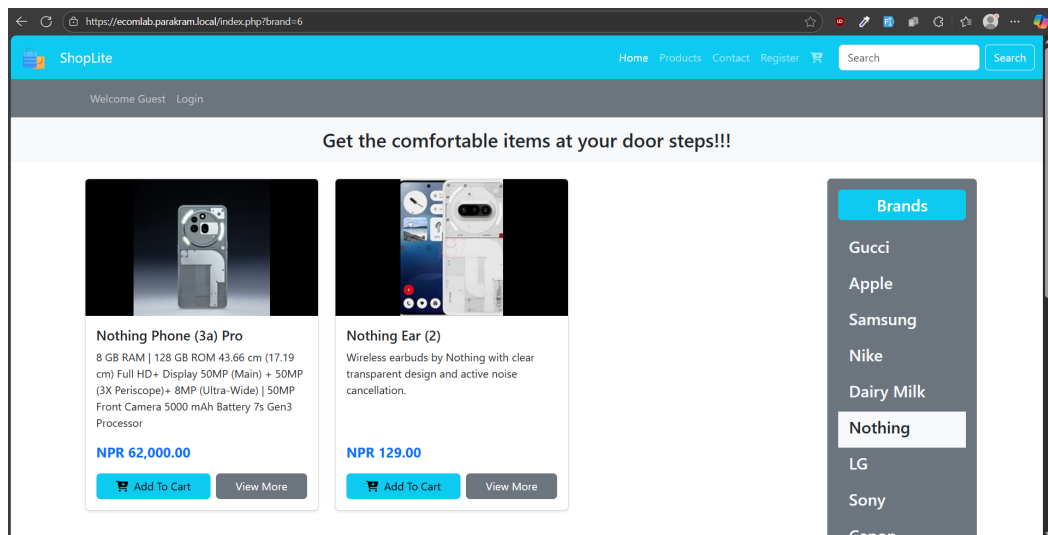
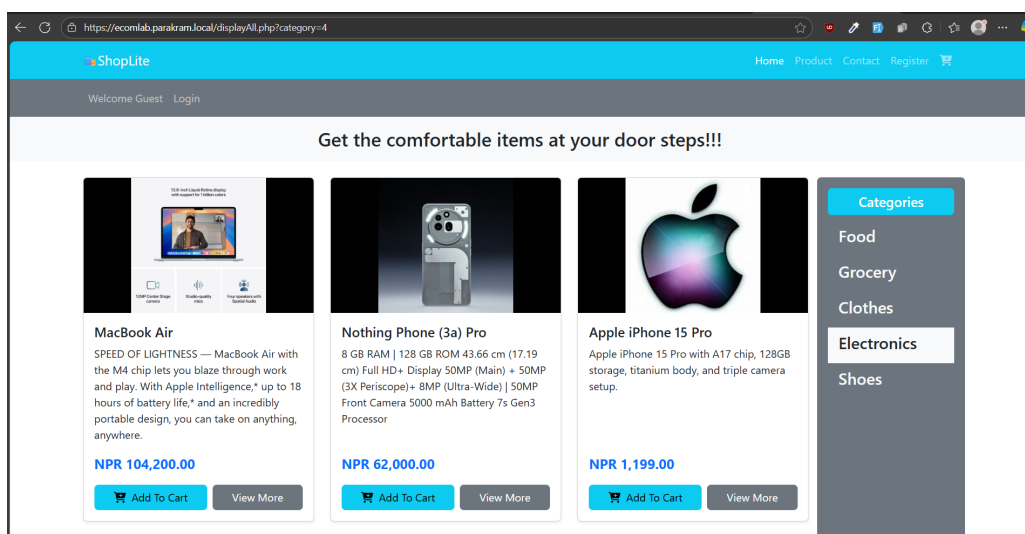Figure 2: Product List.



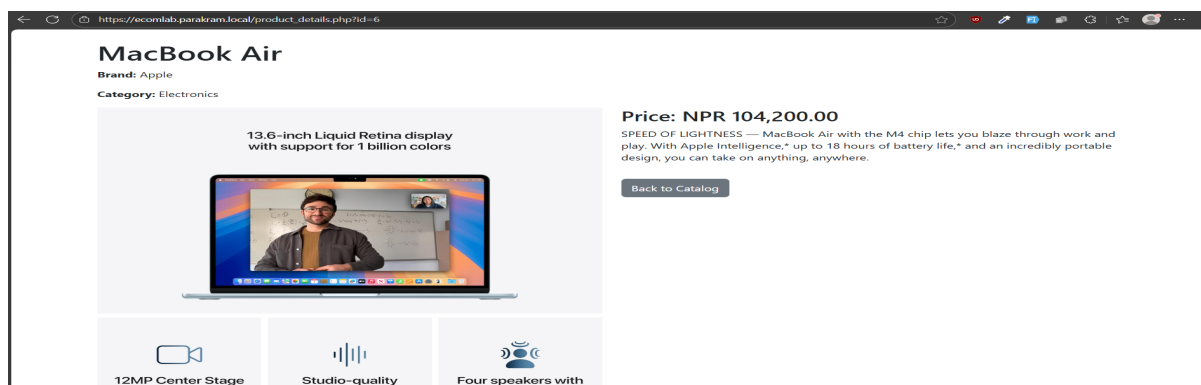Figure 3: Product By Brand.



Figure 4: Product By Category.

Figure 5: Product Details.

# 7. Result

The catalog dynamically fetches products from MySQL and renders them as responsive Bootstrap cards with titles, images, price, and actions. Listing pages support random highlights and server-side filtering by brand or category, with clear empty-state feedback. The product details page securely loads one item by id using a prepared statement, shows up to three images, and provides a back-to-catalog link. Output is escaped to prevent XSS, ids are validated, and consistent image paths keep rendering reliable.

# 8. Conclusion

This lab delivers a fully dynamic, database-driven product catalog with clean server rendering and responsive UI. Students implemented listing and detail views, safe queries, output escaping, and simple search/filter flows. The result is a maintainable foundation ready for pagination, sorting, and cart integration.

# 9. References

- PHP mysqli Prepared Statements

- PHP htmlspecialchars

- MySQL SELECT Reference

- Bootstrap 5 Documentation

- HTTP URLs and Query Strings (MDN)

- Caddy Web Server Documentation