

## Product and Customer Management System with Data Validation

This document describes the **structure, fields, and validation** rules for a Product and Customer Management System implemented with ASP.NET MVC, Entity Framework, and **Data Transfer Objects (DTO)**. The system includes CRUD operations with appropriate validation logic to ensure data integrity.

### Entities: Product and Customer

#### 1. Product

The Product entity represents items available in inventory and includes fields such as **name, price, stock quantity, and category**. The following validations are applied to ensure data integrity:

Fields and Validation:

- - **ProductId**: Primary Key – auto-generated.
- - Name: Required, maximum length of **100 characters**.
- - Description: Optional, maximum length of **500 characters**.
- - Price: Required, **must be greater than 0**.
- - StockQuantity: Required, must be a **positive integer (0 or more)**.
- - Category: Required, maximum **length of 50 characters**, **must match pre-defined categories** (e.g., electronics, clothing, etc.).

DTO: **ProductDTO** with similar properties to transfer data between the view and controller.

CRUD Operations: Implement CRUD functionality for Product, using validations to ensure only valid data is added or updated.

#### 2. Customer

The Customer entity represents users who purchase products and includes fields such as name, email, phone, and date joined. The following validations are applied to ensure data integrity:

Fields and Validation:

- - CustomerId: Primary Key – **auto-generated**.
- - FirstName: Required, maximum length of **50 characters**.
- - LastName: Required, maximum length of **50 characters**.
- - Email: Required, must be **a valid email format**.
- - Phone: Optional, must be a valid phone number format **(10-15 digits)**.
- - Address: Optional, maximum **length of 250 characters**.
- - DateJoined: Required, **cannot be a future date**.

DTO: CustomerDTO to encapsulate data for Customer.

CRUD Operations: Enable CRUD operations for Customer, using these validations to maintain data integrity.