**Day2 Lab1: Boundary value and Edge case testing**

**Password Validator** (commonly seen in login/registration forms).

* Rules:
  1. Password length must be **8–16 characters**.
  2. Must contain **at least 1 digit**.
  3. Must contain **at least 1 uppercase letter**.

**Class to Test**

using System.Linq;

public class PasswordValidator

{

public bool IsValid(string password)

{

if (string.IsNullOrEmpty(password))

return false;

if (password.Length < 8 || password.Length > 16)

return false;

if (!password.Any(char.IsDigit))

return false;

if (!password.Any(char.IsUpper))

return false;

return true;

}

}

**xUnit Tests (Boundary + Edge Cases)**

using Xunit;

public class PasswordValidatorTests

{

private readonly PasswordValidator \_validator = new PasswordValidator();

// ---------- Boundary Value Tests ----------

[Theory]

[InlineData("Pass1234", true)] // Lower length boundary = 8

[InlineData("Pass123", false)] // Just below lower boundary (7 chars)

[InlineData("Password123ABCDEF", true)] // Upper length boundary = 16

[InlineData("Password123ABCDEFG", false)] // Just above upper boundary (17 chars)

public void Test\_BoundaryValues(string password, bool expected)

{

var result = \_validator.IsValid(password);

Assert.Equal(expected, result);

}

// ---------- Edge Case Tests ----------

[Theory]

[InlineData("", false)] // Empty string

[InlineData(null, false)] // Null input

[InlineData("abcdefgh", false)] // No uppercase, no digit

[InlineData("ABCDEFGH", false)] // No digit

[InlineData("12345678", false)] // No uppercase

[InlineData("P@ssword1", true)] // Contains special char, valid

[InlineData("PASS1234", true)] // All uppercase + digit

public void Test\_EdgeCases(string password, bool expected)

{

var result = \_validator.IsValid(password);

Assert.Equal(expected, result);

}

}

**Explanation**

* **Boundary Value Testing**:
  + Minimum valid length (8), maximum valid length (16).
  + Just outside boundaries (7, 17).
* **Edge Case Testing**:
  + Empty & null.
  + Missing uppercase, missing digit.
  + Only digits, only letters.
  + Special characters included.
  + Extreme valid formats.