

Advance Programming Techniques (APT)

Lecture # 38

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Regular Expression

- Regular Expressions (RegEx) are specially formatted strings used to find patterns in text.
- Regular Expressions (RegEx) are powerful text-matching patterns used to validate, search, or manipulate strings
- In C#, RegEx is available through the **System.Text.RegularExpressions** namespace

Why do we need RegEx?

- Because normal string functions (Contains, StartsWith, Length checks) are not enough for patterns like:
 - Valid email format
 - Strong password
 - CNIC format
 - Phone numbers
 - Only alphabets
 - Only digits etc
- RegEx gives us **perfect control** over allowed and forbidden formats

Using RegEx in C#

- Add this namespace first:

```
using System.Text.RegularExpressions;
```

- Then validate using:

```
bool isValid = Regex.IsMatch(inputText, pattern);
```

- Or create a RegEx object:

```
Regex rg = new Regex(pattern);
bool isValid = rg.IsMatch(input);
```

Basic Metacharacters (Very Important)

Symbol	Meaning	Example
.	any single character	a.c matches "a", "c"
^	start of string	^A(starts with A)
\$	end of string	Z\$(ends with Z)
[]	character class	[abc], [o-9]
[^]	NOT	[^a-z]
+	1 or more	[o-9]+
*	0 or more	[a-z]*
?	optional	colo?r matches color/colour
{m,n}	repetition range	[o-9]{4}
\d \D	any digit	[o-9]
\w \W	any word char	letters + digits + _
\s \S	any whitespace	spaces, tabs

Simple Examples

- RE to test only alphabets
- RE to test only digits
- RE to test username (letters, digits, length from 5 to 12)
- RE to test PIN (fixed-length numbers 4-digit PIN)
- RE to test a string which must start with capital letter
- RE to test phone number (Pakistan format 03xx-xxxxxxx)
- RE to test CNIC (xxxxx-xxxxxxxx-x)

Complex Examples

- Email validation
- Strong password (uppercase, lowercase, digit, special, 8+ chars)

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