

## **Lab 2-3**



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**Subject:**

**Compiler Construction**

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## Compiler Construction

### Lab 2

#### Lab Activity 1:

This activity demonstrates the removal of extra white spaces:

The screenshot shows the Microsoft Visual Studio IDE interface. The top menu bar includes File, Edit, View, Git, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, Help, and a Search bar. The title bar says 'CompilerConstruction'. The left pane shows the 'Solution Explorer' with a single project 'CompilerConstruction' containing a file 'Program.cs'. The right pane shows the 'Output' window with the command 'dotnet run' and its results.

```
1  using System;
2  using System.Text.RegularExpressions;
3
4  namespace RegExApplication
5  {
6      // Lab 1
7      //Lab Activity 1
8      0 references
9      class Program
10     {
11         0 references
12         static void Main(string[] args)
13         {
14             string input = "Hello    World   ";
15             string pattern = @"\s+";
16             string replacement = " ";
17             Regex rgx = new Regex(pattern);
18             string result = rgx.Replace(input, replacement);
19
20             Console.WriteLine("Original String: {0}", input);
21             Console.WriteLine("Replacement String: {0}", result);
22             Console.ReadKey();
23         }
24     }
25 }
```

Output

```
C:\ D:\Compiler Construction Lab\CompilerConstruction\CompilerConstruction\bin\Debug\net8.0\CompilerConstruction.exe
Original String: Hello    World
Replacement String: Hello World
```

#### Lab Activity 2:

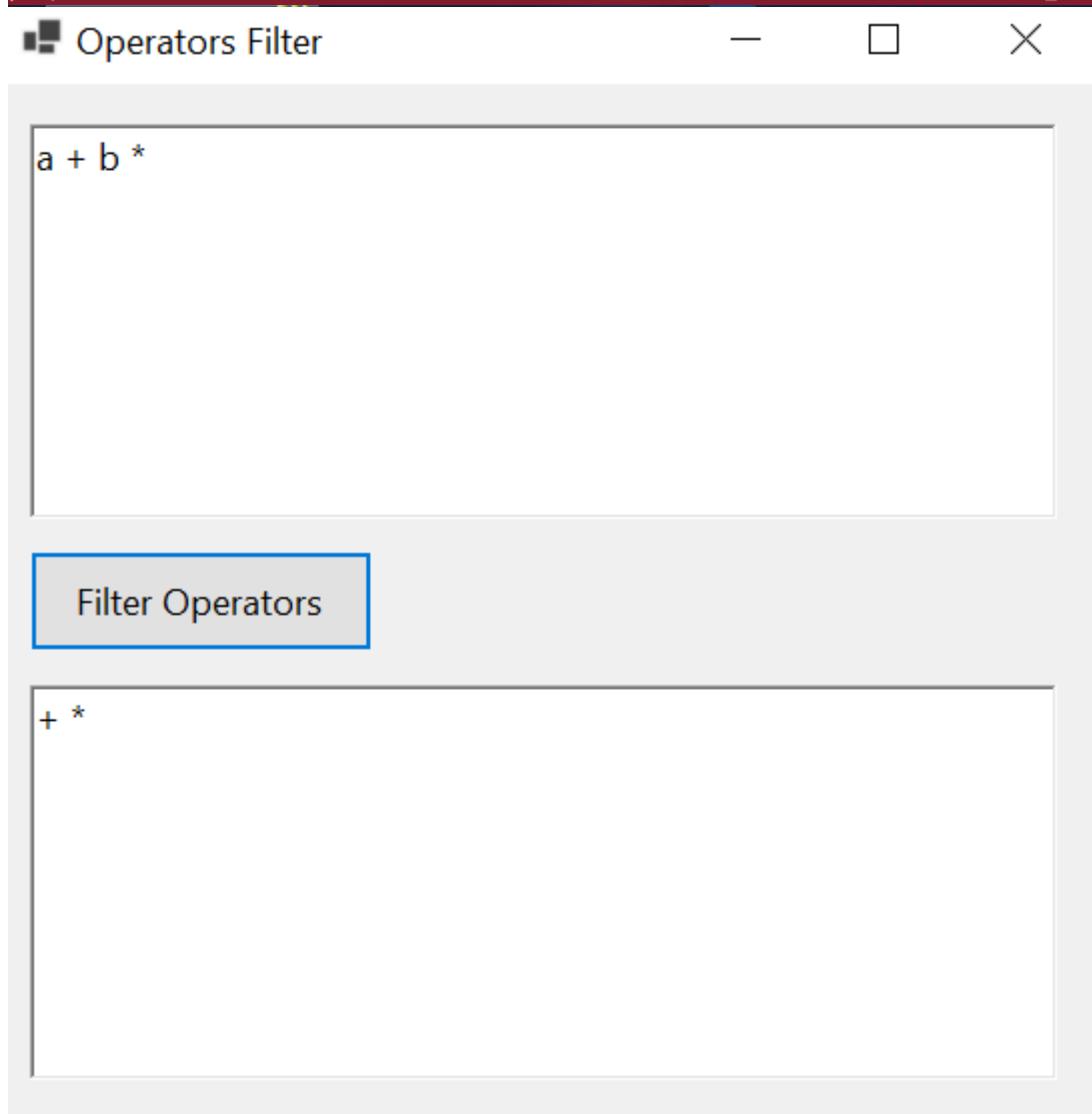
Design regular expression for arithmetic operators: Regular Expression for operators:  
[+|\*|/|-]

```
1  using System;
2  using System.Collections.Generic;
3  using System.ComponentModel;
4  using System.Data;
5  using System.Drawing;
6  using System.Linq;
7  using System.Text;
8  using System.Threading.Tasks;
9  using System.Windows.Forms;
10 using System.Text.RegularExpressions;
11
12 namespace Lab_Actictys
13 {
14     public partial class Form1 : Form
15     {
16         private RichTextBox richTextBox1;
17         private RichTextBox richTextBox2;
18         private Button button1;
19     }
20 }
```

No issues found

Output

```
'Lab_Actictys.exe' (CoreCLR: DefaultDomain): Loaded 'C:\Program Files\dotnet\shared\Microsoft.NETCore.App\8.0.19\System.Private.CoreLib.dll'. Skipped loading symbols. Module is optimized and the debugger cannot evaluate it.
'Lab_Actictys.exe' (CoreCLR: clrhost): loaded 'D:\Compiler Construction Lab\Lab_Actictys\Lab_Actictys\bin\Debug\net8.0-windows\Lab_Actictys.dll'. Symbols loaded.
'Lab_Actictys.exe' (CoreCLR: clrhost): loaded 'C:\Program Files\dotnet\shared\Microsoft.NETCore.App\8.0.19\System.Runtime.dll'. Skipped loading symbols. Module is optimized and the debugger cannot evaluate it.
'Lab_Actictys.exe' (CoreCLR: clrhost): loaded 'C:\Program Files\Microsoft Visual Studio\2022\Preview\Common7\IDE\CommonExtensions\Microsoft\HotReload\Microsoft.Extensions.DotNetDelta'.
'Lab_Actictys.exe' (CoreCLR: clrhost): loaded 'C:\Program Files\dotnet\shared\Microsoft.NETCore.App\8.0.19\System.IO.Pipes.dll'. Skipped loading symbols. Module is optimized and the debugger cannot evaluate it.
'Lab_Actictys.exe' (CoreCLR: clrhost): loaded 'C:\Program Files\dotnet\shared\Microsoft.NETCore.App\8.0.19\System.Linq.dll'. Skipped loading symbols. Module is optimized and the debugger cannot evaluate it.
'Lab_Actictys.exe' (CoreCLR: clrhost): loaded 'C:\Program Files\dotnet\shared\Microsoft.NETCore.App\8.0.19\System.Collections.dll'. Skipped loading symbols. Module is optimized and the debugger cannot evaluate it.
```

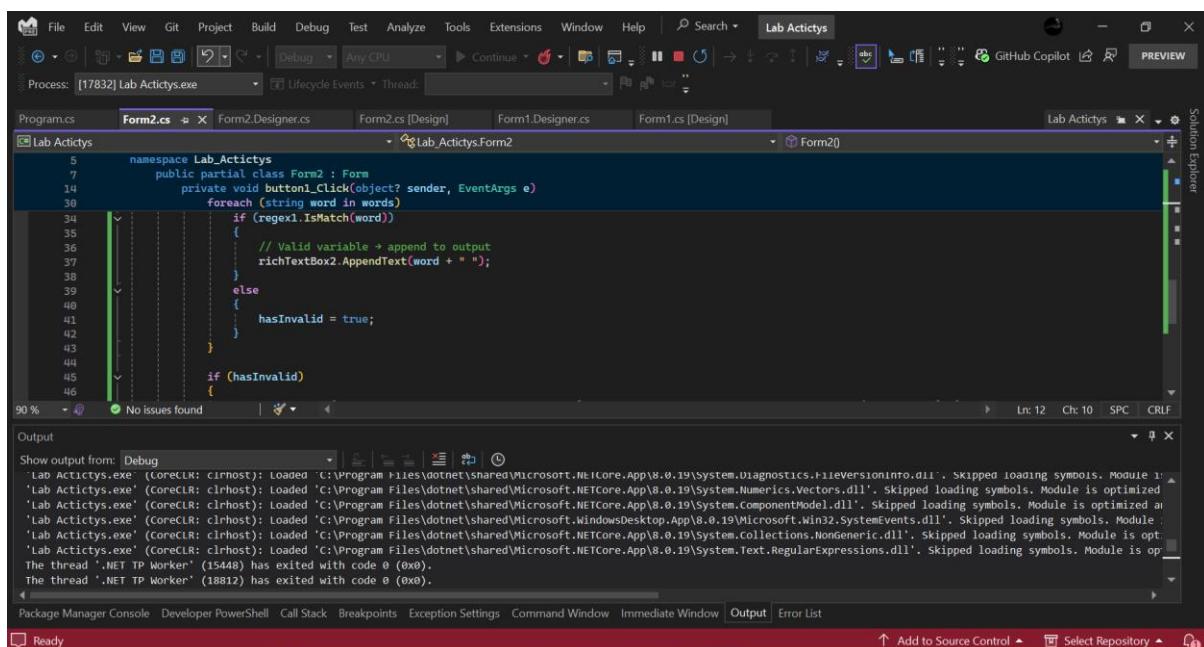


### Activity 3:

*Any meta character with special meaning may be quoted by preceding it with a backslash. In basic regular expressions the metacharacters "?", "+", "{", "|", "(", and ")" lose their special meaning; instead use the backslashed versions "\?", "\+", "\{", "\|", "\(", and "\)".*

*Regular Expression for variables is: [A-Za-z][A-Za-z|0-9]\**

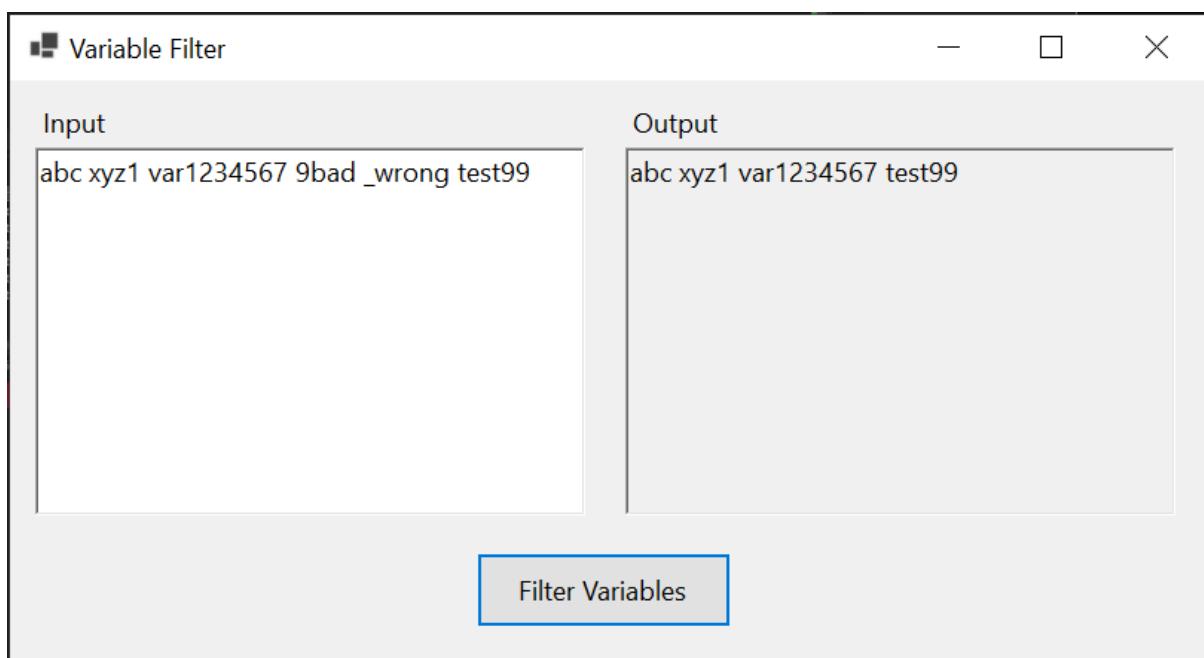
*Design a regular expression for variables that should start with a letter, have a length not greater than 10 and can contain combination of digits and letters afterwards.*



The screenshot shows the Microsoft Visual Studio IDE interface. The top menu bar includes File, Edit, View, Git, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, Help, and a GitHub Copilot icon. The title bar says "Lab Acticys". The main window displays the code for "Form2.cs" in the "Design" view. The code is as follows:

```
5  namespace Lab_Acticys
7  {
8      public partial class Form2 : Form
9      {
10         private void button1_Click(object? sender, EventArgs e)
11         {
12             foreach (string word in words)
13             {
14                 if (regex1.IsMatch(word))
15                 {
16                     // Valid variable → append to output
17                     richTextBox2.AppendText(word + " ");
18                 }
19                 else
20                 {
21                     hasInvalid = true;
22                 }
23             }
24             if (hasInvalid)
25             {
26             }
27         }
28     }
29 }
```

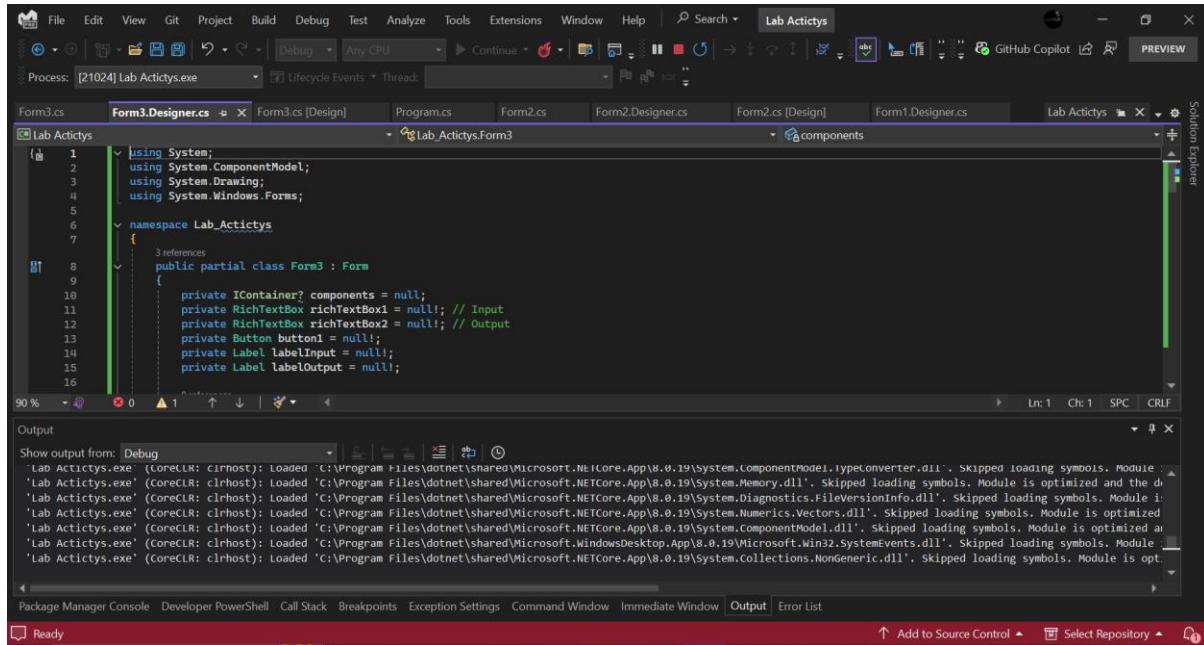
The status bar at the bottom indicates "No issues found". The bottom right corner shows "En: 12 Ch: 10 SPC CRLF". The bottom navigation bar includes Package Manager Console, Developer PowerShell, Call Stack, Breakpoints, Exception Settings, Command Window, Immediate Window, Output (selected), Error List, and a "Ready" indicator.



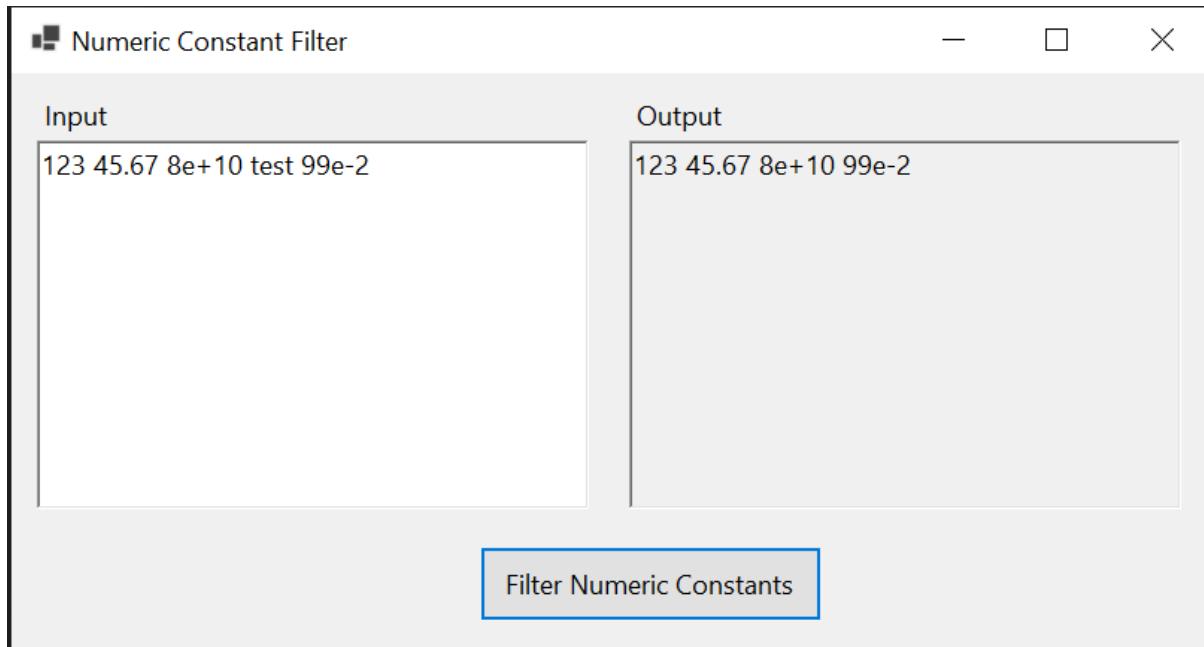
## Lab 03

### Activity 1:

**Design a regular expression for constants (digits plus floating point numbers): Regular Expression for Constants: [0-9]+((.[0-9]+)?([e][+|-]J[0-9]+)?)? Using Datagrid view.**

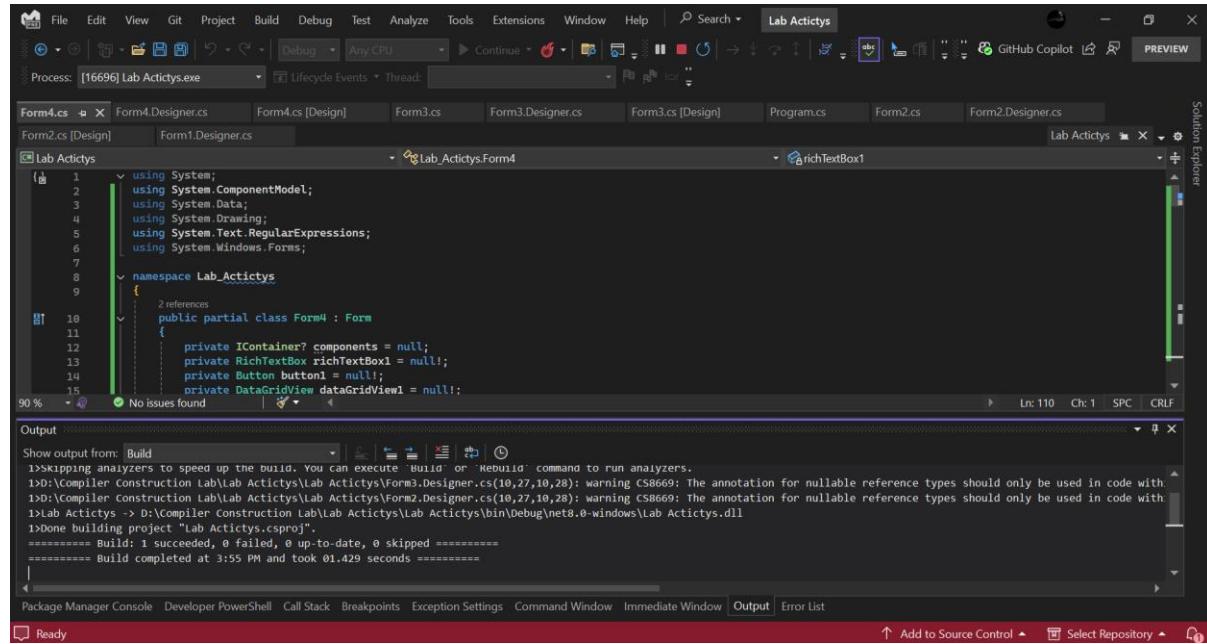


```
1 using System;
2 using System.ComponentModel;
3 using System.Drawing;
4 using System.Windows.Forms;
5
6 namespace Lab_Actictys
7 {
8     public partial class Form3 : Form
9     {
10         private IContainer components = null;
11         private RichTextBox richTextBox1 = null; // Input
12         private RichTextBox richTextBox2 = null; // Output
13         private Button button1 = null;
14         private Label labelInput = null;
15         private Label labelOutput = null;
16     }
}
```



## Activity 2:

**Design a regular expression for keywords.(Using Datagrid view). Regular Expression for keywords:[int | float | double | char]**



The screenshot shows the Microsoft Visual Studio IDE interface. The code editor displays a C# file named Form4.cs with the following content:

```
1  using System;
2  using System.ComponentModel;
3  using System.Data;
4  using System.Drawing;
5  using System.Text.RegularExpressions;
6  using System.Windows.Forms;
7
8  namespace Lab_Acticys
9  {
10     public partial class Form4 : Form
11     {
12         private IContainer? components = null;
13         private RichTextBox richTextBox1 = null!;
14         private Button button1 = null!;
15         private DataGridView dataGridView1 = null!;
16     }
17 }
```

The Output window below shows the build results:

```
Show output from: Build
1> Skipping analyzers to speed up the build. You can execute 'Build' or 'Rebuild' command to run analyzers.
1> D:\Compiler Construction Lab\Lab Acticys\Lab Acticys\Form3.Designer.cs(10,27,10,28): warning CS8669: The annotation for nullable reference types should only be used in code with
1> D:\Compiler Construction Lab\Lab Acticys\Lab Acticys\Form2.Designer.cs(10,27,10,28): warning CS8669: The annotation for nullable reference types should only be used in code with
1> Lab Acticys -> D:\Compiler Construction Lab\Lab Acticys\Lab Acticys\bin\Debug\net8.0-windows\Lab Acticys.dll
1> Done building project "Lab Acticys.csproj".
===== Build: 1 succeeded, 0 failed, 0 up-to-date, 0 skipped =====
===== Build completed at 3:55 PM and took 01.429 seconds =====
```

