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Calculator

WEEKLY DEMO

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Features

- Given a string of operators (+ - * and /) and numbers
- Calculation order is of importance:
    1. Multiplication, Division
    2. Addition, Subtraction
- *"2/2+3*4-6"* expected to be 7

Challenges

- **When parsing:**
  - No *String.Split()* as there are no spaces “ ” to split by

Challenges

- **When calculating:**
- Linear approach doesn’t work

“2+2*4+8/2 …”

Solution - Parsing

- Parsing into *List<string>*
  - *“5/2+3*4-5.5” =>*
  - *“5”, “/”, “2”, “+”, “3”, “*”, “4”, “-”, “5.5”*
  - List.Count = 9

Solution – Perform Calculation

- Collapsing list

1. Look for **multiplications** and perform them

- *“5”, “/”, “2”, “+”, “3”, “*”, “4”, “-”, “5.5”*
- *“5”, “/”, “2”, “+”, “12”, “-”, “5.5”*
- List.Count = 7

Solution – Perform Calculation

- Collapsing list

1. Look for **divisions** and perform them

- *“5”, “/”, “2”, “+”, “12”, “-”, “5.5”*
- *“2.5”, “+”, “12”, “-”, “5.5”*
- List.Count = 5

Solution – Perform Calculation

- Collapsing list
  1. Look for **additions** and perform them
  - *“2.5”, “+”, “12”, “-”, “5.5”*
  - *“14.5”, “-”, “5.5”*
  - List.Count = 3

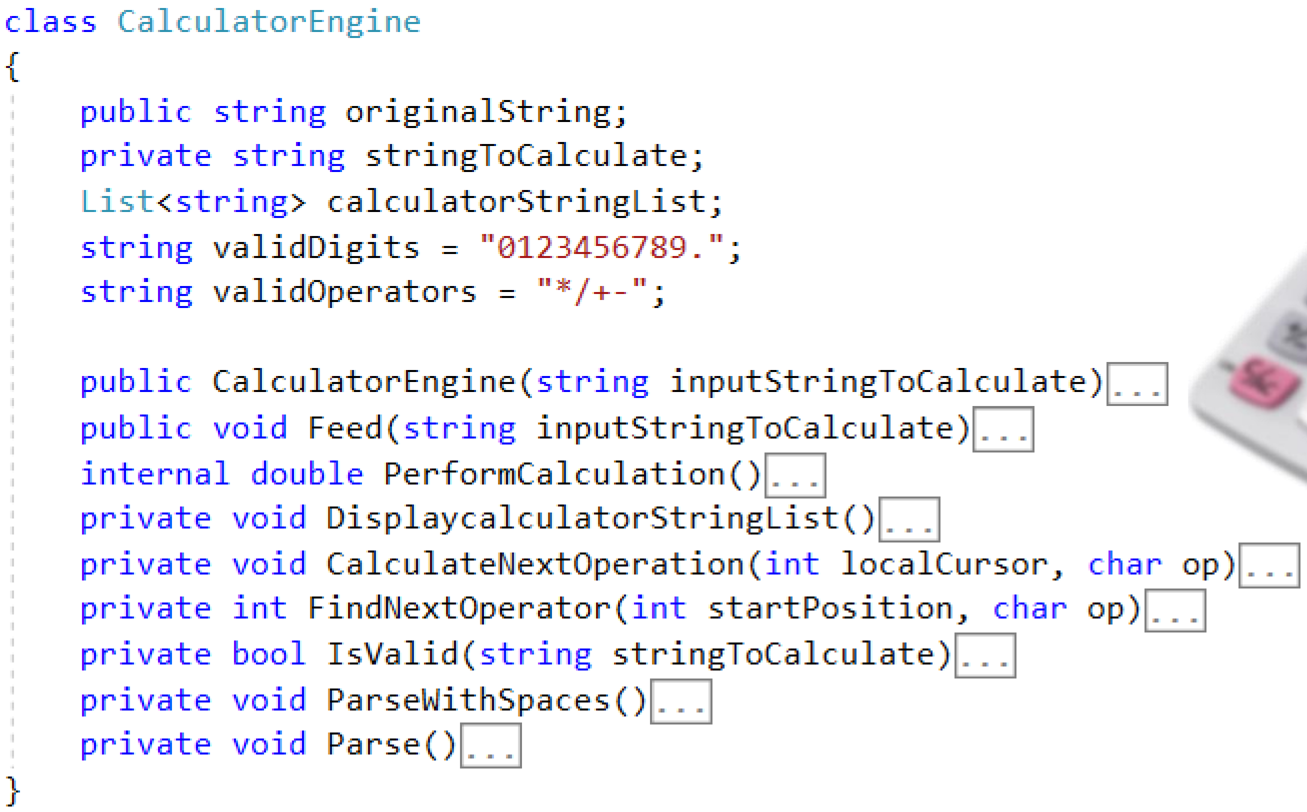
Solution – Perform Calculation

- Collapsing list

1. Look for **subtractions** and perform them

- *“14.5”, “-”, “5.5”*
- *“9”*
- List.Count = 1

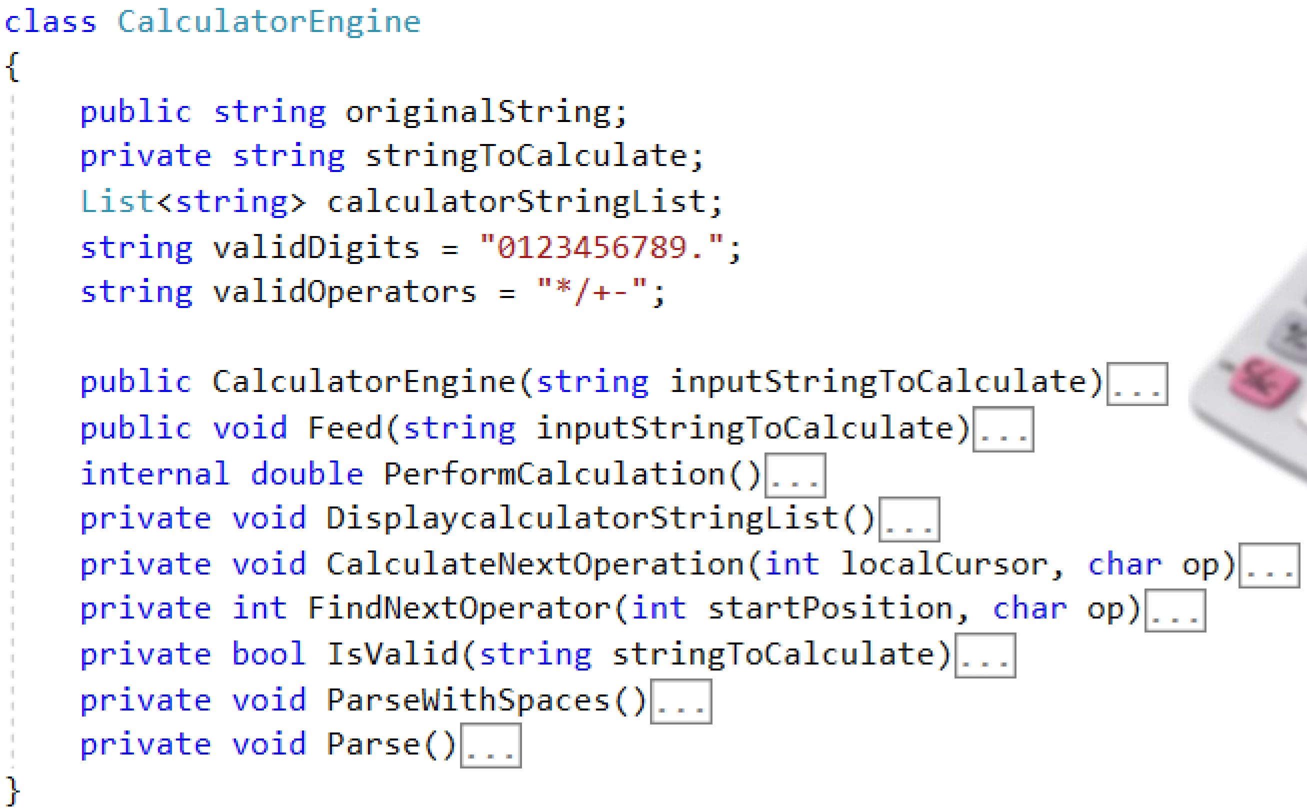
Snippets



```
class CalculatorEngine
{
    public string originalString;
    private string stringToCalculate;
    List<string> calculatorStringList;
    string validDigits = "0123456789.";
    string validOperators = "*/+-";

    public CalculatorEngine(string inputStringToCalculate)...
    public void Feed(string inputStringToCalculate)...
    internal double PerformCalculation()...
    private void DisplaycalculatorStringList()...
    private void CalculateNextOperation(int localCursor, char op)...
    private int FindNextOperator(int startPosition, char op)...
    private bool IsValid(string stringToCalculate)...
    private void ParseWithSpaces()...
    private void Parse()...
}
```

Snippets



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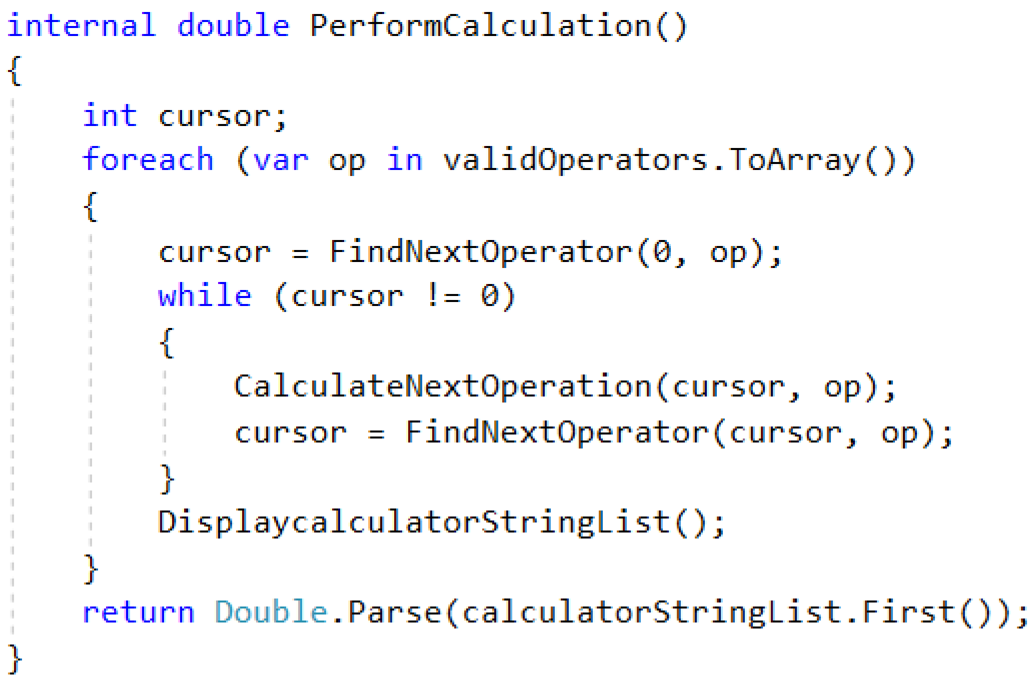
Snippets



```
internal double PerformCalculation()
{
    int cursor;
    foreach (var op in validOperators.ToArray())
    {
        cursor = FindNextOperator(0, op);
        while (cursor != 0)
        {
            CalculateNextOperation(cursor, op);
            cursor = FindNextOperator(cursor, op);
        }
        DisplaycalculatorStringList();
    }
    return Double.Parse(calculatorStringList.First());
}
```

Thank you for the attention

Available on GitHub:

Code:

- https://github.com/greenfox-academy/**bramble100**/tree/master/week-03/**Calculator**

Slides:

- https://github.com/greenfox-academy/**bramble100**/tree/master/week-03/**demo**