POWERSHELL SCRIPT ANALYZER RULES

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WHAT IS THE SCRIPT ANALYZER?

Who is using this today?

WHY THE SCRIPT ANALYZER?

Maintaining code quality is hard work.

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Demo!

What comes out of the box?

https://github.com/fredbainbridge/CustomPSScriptAnalyzerRules

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ANOTHER REASON WHY.

You can create your own rules!

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Demo!

Function Naming Standards

https://github.com/fredbainbridge/CustomPSScriptAnalyzerRules

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THE COMMUNITY RULES.

Yes it does.

https://github.com/PowerShell/PSScriptAnalyzer/tree/development/Tests/Engine/CommunityAnalyzerRules

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Demo!

The Community Rules.

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MORE REASONS WHY!

You can automate all of this. (Duh, its PowerShell)

Demo! Short Variable Names

$i see what you did there.

https://github.com/fredbainbridge/CustomPSScriptAnalyzerRules

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EVEN MORE REASONS WHY!

You need to follow the rules to publish your code to the PowerShell Gallery.

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CREATING YOUR OWN RULES

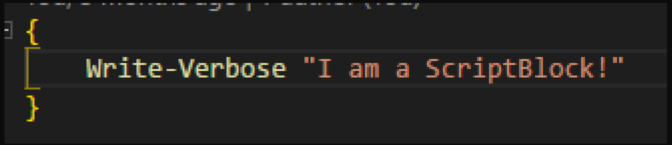
The fun stuff.

WHAT IS HAPPENING HERE?

- You are writing a module. (.psm1 file)
- Q: What is a script analyzer rule doing?
- A: It is taking a script block and testing it based on your conditions.

WHAT IS HAPPENING HERE? SCRIPTBLOCK EDITION

- What is a script block?



```
{
    Write-Verbose "I am a ScriptBlock!"
}
```

- Is it a string? No. It is a specific object type.

```
$ScriptBlock = [Scriptblock]::Create($string)
```

- https://docs.microsoft.com/en-us/dotnet/api/system.management.automation.scriptblock?view=powershellsdk-1.1.0

- The entirety of a ps1 file gets treated as a script block (generally) when using the script analyzer.

WHAT IS HAPPENING HERE? AST EDITION

- System.Management.Automation is a common namespace you will be working with.
- A script block is automatically converted to a collection of AST (Abstract Syntax Tree) objects. AST objects are the representation of your functions, variables, tokens, etc.
- You might be amazed to see how far and to what level of detail a script block gets broken down into.

https://docs.microsoft.com/en-us/dotnet/api/system.management.automation.language?view=powershellsdk-1.1.0

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Breaking down a script into AST objects.

https://github.com/fredbainbridge/CustomPSScriptAnalyzerRules

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WHAT IS HAPPENING HERE? AST FILTERING

- You can then filter the Collection of AST objects to only return the ones you are interested in. i.e. Functions or a specific token.

- How can I find interrogate just the AST objects I care about?

Filtering AST objects. (Predicates)

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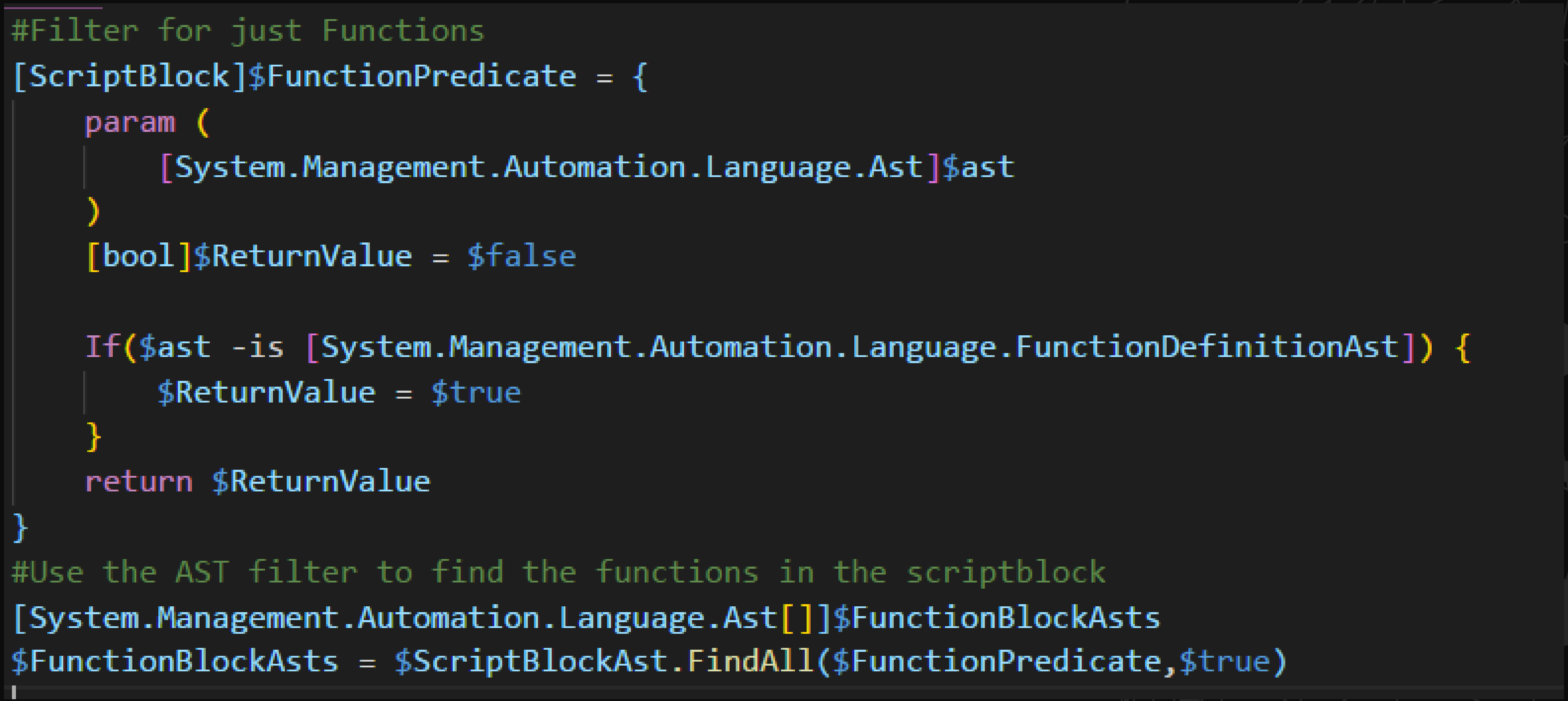
PREDICATE EXAMPLE



```
#Filter for just Functions
[ScriptBlock]$FunctionPredicate = {
    param (
        [System.Management.Automation.Language.Ast]$ast
    )
    [bool]$ReturnValue = $false

    If($ast -is [System.Management.Automation.Language.FunctionDefinitionAst]) {
        $ReturnValue = $true
    }
    return $ReturnValue
}
#Use the AST filter to find the functions in the scriptblock
[System.Management.Automation.Language.Ast[]]$FunctionBlockAsts
$FunctionBlockAsts = $ScriptBlockAst.FindAll($FunctionPredicate,$true)
```

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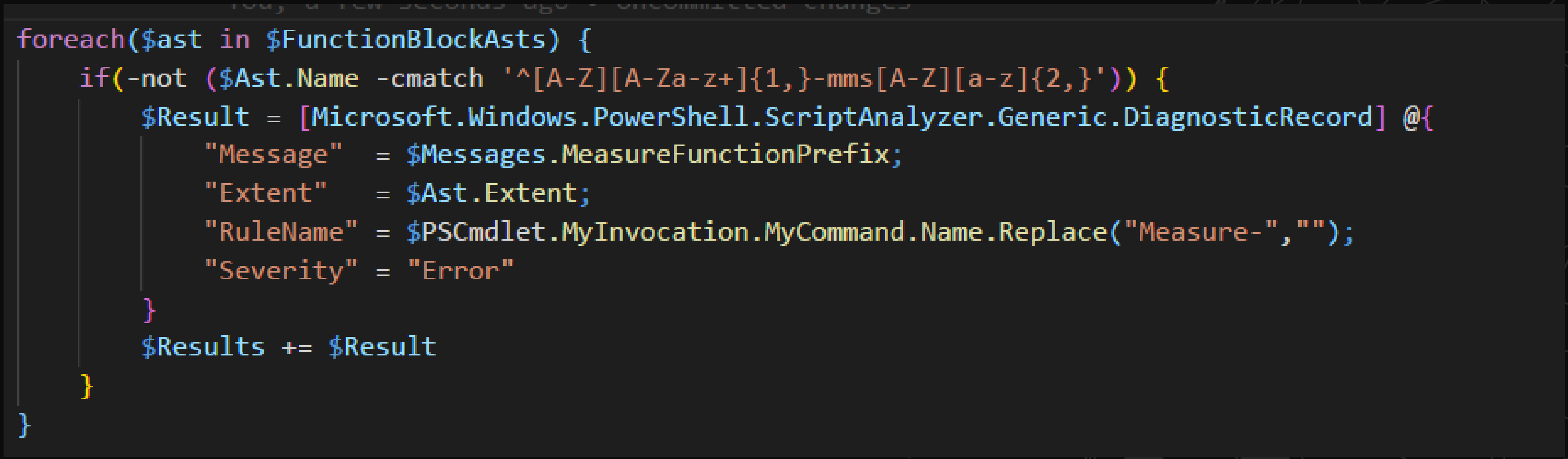
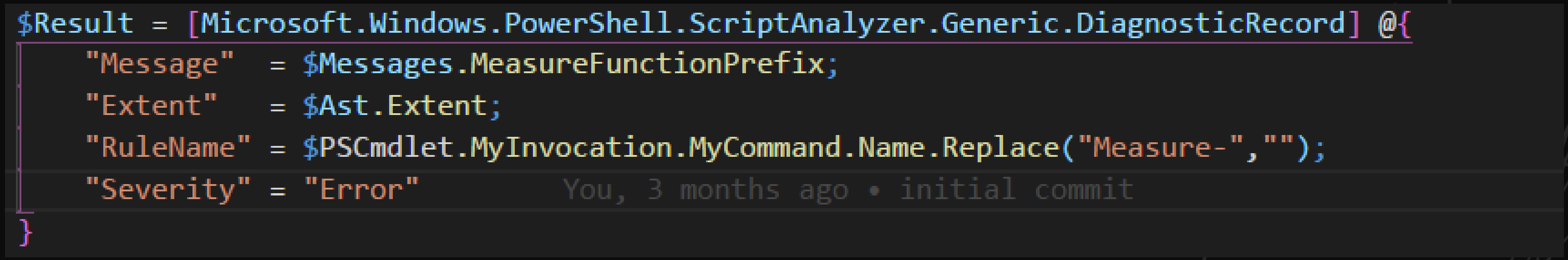
TEST YOUR RESULTS



```
foreach($ast in $FunctionBlockAsts) {
    if(-not ($Ast.Name -cmatch '^[A-Z][A-Za-z+]{1,}-mms[A-Z][a-z]{2,}')) {
        $Result = [Microsoft.Windows.PowerShell.ScriptAnalyzer.Generic.DiagnosticRecord] @{
            "Message"  = $Messages.MeasureFunctionPrefix;
            "Extent"   = $Ast.Extent;
            "RuleName" = $PSCmdlet.MyInvocation.MyCommand.Name.Replace("Measure-","");
            "Severity" = "Error"
        }
        $Results += $Result
    }
}
```

DIAGNOSTICRECORD

- This is splatting parameters to the Diagnostic record constructor.



```
$Result = [Microsoft.Windows.PowerShell.ScriptAnalyzer.Generic.DiagnosticRecord] @{
    "Message"  = $Messages.MeasureFunctionPrefix;
    "Extent"   = $Ast.Extent;
    "RuleName" = $PSCmdlet.MyInvocation.MyCommand.Name.Replace("Measure-","");
    "Severity" = "Error"         You, 3 months ago • initial commit
}
```

- Message - this is just a string that is displayed to the user. We wrapped it up using a little helper to make the code prettier. It is not needed. "Message" = "you wrote bad code here" would work too.
- Extent: This is the line number and some other meta data about your AST in relation to the bigger script.
- Rule Name: This is the rule name returned. (displayed to user)
- Severity: Error, Warning, Info. This must be exact.

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Testing for Tokens!

$object | Slow-DownMyScript

https://github.com/fredbainbridge/CustomPSScriptAnalyzerRules

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Integrating custom rules with VS Code

https://github.com/fredbainbridge/CustomPSScriptAnalyzerRules

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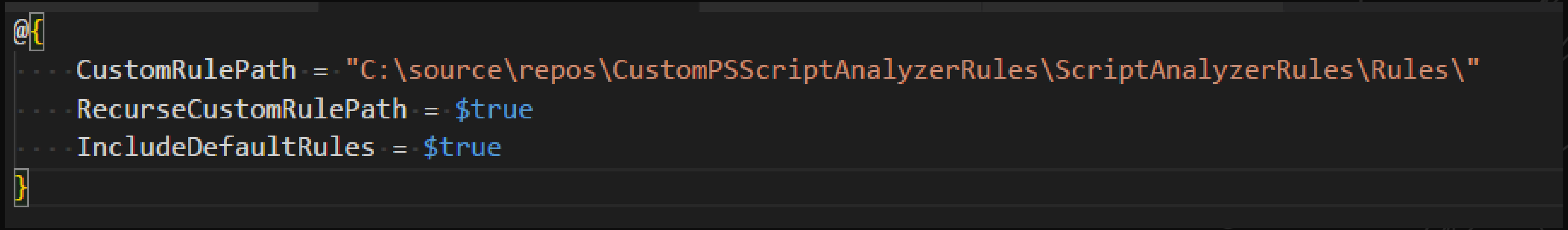
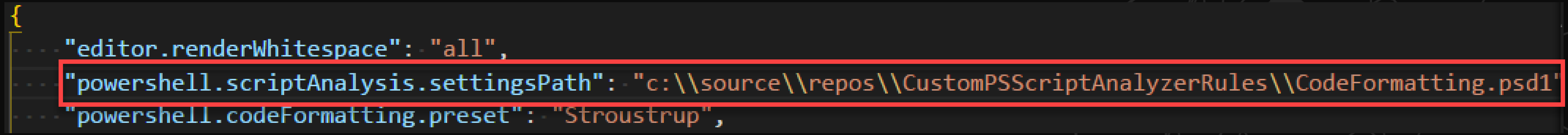
INTEGRATING WITH VS CODE

- 1. Create a CodeFormatting.psd1



```
@{
    CustomRulePath = "C:\source\repos\CustomPSScriptAnalyzerRules\ScriptAnalyzerRules\Rules\"
    RecurseCustomRulePath = $true
    IncludeDefaultRules = $true
}
```

- 2. Configure the PowerShell extension to use this code formatting definition.



```
{
    "editor.renderWhitespace": "all",
    "powershell.scriptAnalysis.settingsPath": "c:\\source\\repos\\CustomPSScriptAnalyzerRules\\CodeFormatting.psd1"
    "powershell.codeFormatting.preset": "Stroustrup",
```

Extended Q&A

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