

PowerShell Advanced Fundamentals

Introduction

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Agenda

gitStarted

VS Code

Filters, Functions and Advanced Functions

PowerShell Classes

Regex Intro

API

Error Handling

Debugging

Building Modules

Testing with Pester

Bring Your Own Lab

Lab 0

git Started

Why version control?

Script-Folder problem

Go back and forth in time

Central storage

History of What, When and Whom

Why?

Collaboration

git vs GitHub

Protocol

Service

Installing git for Windows

Use GUI but get comfortable with CLI

Only six commands!

git status

git init / git clone

git add

Start with CLI

git pull --rebase

git commit

git push

- Visual tools
 - GitHub for Windows
 - VS Code
 - posh-git

- Lab 1

VS Code

- WHY?

- Free
 - Cross-platform
 - AWESOME!

- Basic Features

- Open Folder
 - Zen mode
 - Snippets
 - git integration
 - Extensions

- Editor Features

- Move row
 - Comment
 - Rename
 - Multi Cursor

- PowerShell Integration

- Terminal
 - IntelliSense
 - Code-format
 - Debugger

Filters, Functions and Advanced Functions

- Goal: Re-Use Code!

- Multiple copies are hard to maintain
 - Never Copy & Paste code!
 - Hiding details makes a script easier to read

- Example

- Just code
 - Function and code

- Function and Filter

- Verb-Noun

- Three Types of "functions"

- Filter

- Optimized for Pipeline
 - Uses \$_
 - Handy, but not very well known

- Function

- Not for pipelines
 - Easy to understand
 - Good for "helpers"

- Advanced Function

- Rich Parameter support

- Metadata

- Mandatory
 - Position
 - Pipeline Input
 - ParameterSetName
 - Alias
 - HelpMessage
 - DontShow

- Type

- Implicit Casting

- Validation
 - AllowNull()
 - AllowEmptyString()
 - ValidateCount(1,5)
 - ValidateLength(1,5)
 - ValidatePattern('+')
 - ValidateScript({ Test-Path \$_ })
 - ValidateSet('Apelsin', 'Banan', 'Clementin')
 - ErrorMessage
- Switch-Parameters
 - On / Off
- CmdletBinding
 - ConfirmImpact
 - DefaultParameterSetName
 - HelpUri
 - SupportsShouldProcess

Lab 2

PowerShell Classes

- More Dev-Oriented
 - Only output from return

Class

- Property
- Method
- Constructor
- Hidden Property
- Static

Enum

- Bitflag-like

Inheritance

Interfaces

Lab 3

Regex

Pattern matching

- Validating input

- Searching for part of text

- Replacing text

Use web tools

- Flavors

- Regular Expression Language - Quick Reference ([link](#))

- Online regex tester and debugger: PHP, PCRE, Python, Golang and JavaScript ([link](#))

Special chars

- [\$.|?*(+)

Classes

- Word

- Space

- Digit

- Character group

- Unicode

Quantifiers

- ?

- *

- +

- {2}

- {2,}

- {2,5}

Groups

- Subexpression My name is (+)

Named Subexpression My name is (<?name>+)

Lab 4

API

What is an API?

Invoke-WebRequest

Invoke-RestMethod

Authentication

Basic

Username / password

PAT - Personal Access Tokens

OAuth

-UseDefaultCredentials

TLS

Encoding

Lab 5

Error Handling

Terminating vs Non-terminating

ErrorAction / ErrorActionPreference

ErrorView

Get-Error

Trap

Try/Catch/Finally

Lab 6

Debugging

Hard see what happens inside child scopes

Set-PSBreakpoint

Line

Script

Action

Column

Command

Script

Action

Variable

Script

Action

Mode

VSCode Breakpoints

Line

Condition

HitCount

Log

Watch window

Lab 7

Building Modules

Basic

psm1

Folder name

Manifest

Splitting code

Private

Public

Class

Combining code

Faster load time

Looking good

Help

External Help

Comment Based

Module helper tools

Plaster - Scaffold and set up your projects

ModuleBuilder - Combine and build your modules

Invoke-Build - Build and Test automation tool

PlatyPS - Write help in Markdown

Can be done in C#

PSGallery

Lab 8

Testing Code with Pester

Testing Code

Unit

Integration

TDD

Infrastructure Testing

Lab 9

Bring Your Own Lab