# Fundamental of Scripting

By Joshua Acklin

Software Engineering Institute
Carnegie Mellon University
Pittsburgh, PA  15213

# Introduction

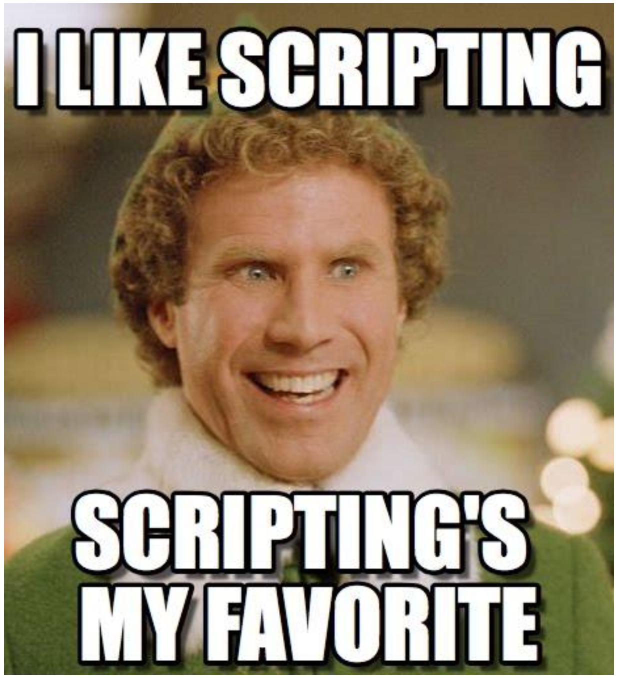
Fundamental of Scripting

# What is Scripting?

# Scripting Characteristics

- Programs written in real-time environment for automating and executing tasks
- Interpreted at run time and traditionally not compiled
- Traditionally executed line by line
- Languages are easy to learn, create and execute

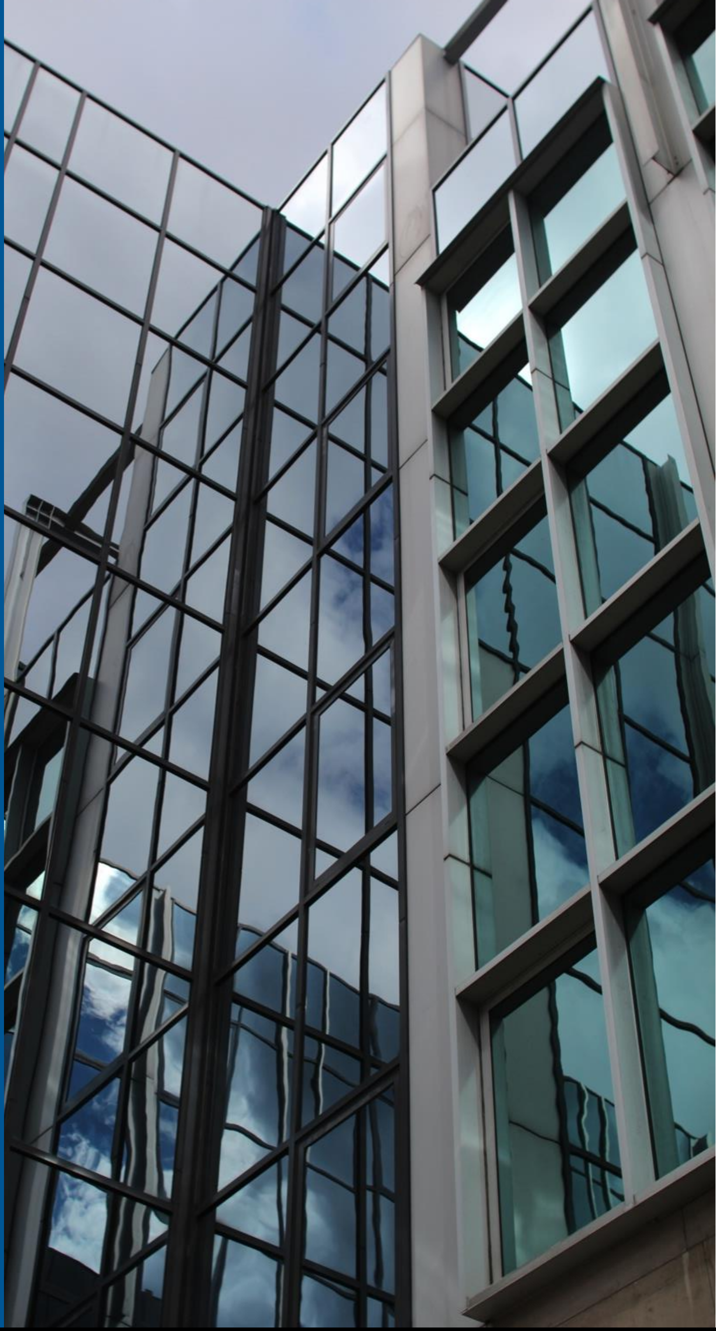
# Scripting Goals



- Automation
- Complete many operations easily and quickly
- Display system information in desired format
- Easy and Fun

Fundamental of Scripting

# Why learn scripting?

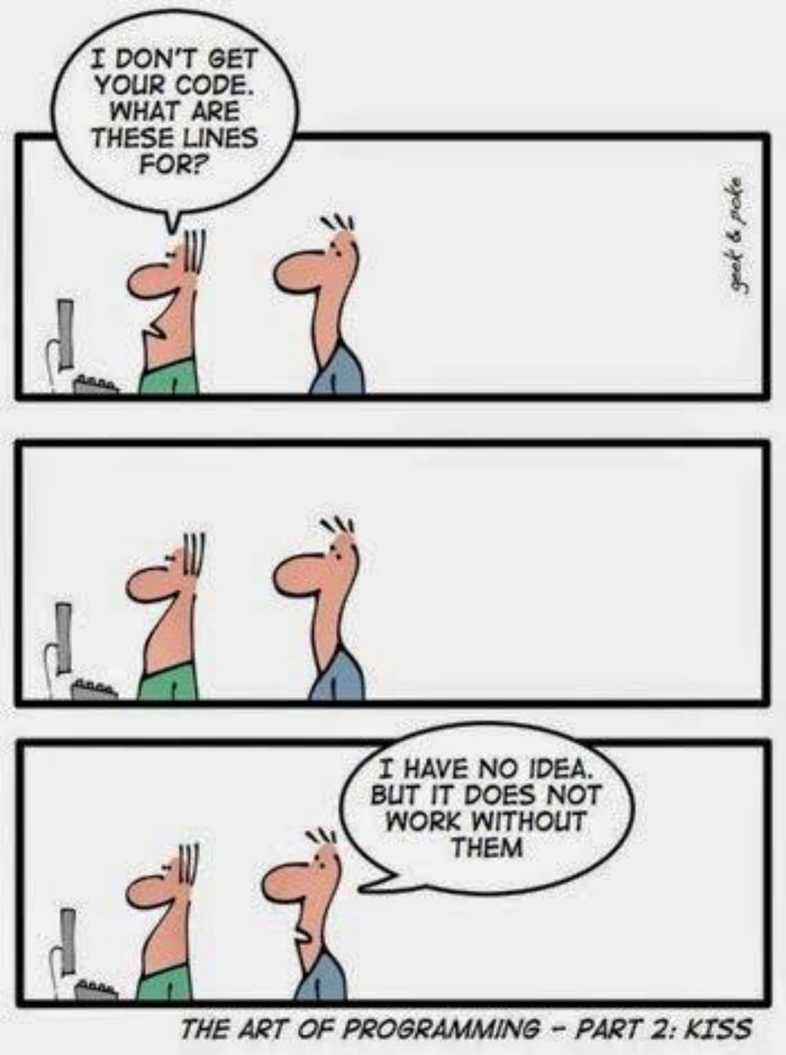


# Automation

AUTOMATED ENTIRE JOB WITH PYTHON SCRIPTS
NOT SURE IF BEING FIRED OR PROMOTED
memegenerator.net

- Is a big deal right now
- IT professionals are being asked to preform more tasks
- Systems are continuing to be more complex
- It allows one person to do the job of many
- Schedule and execute scheduled tasks

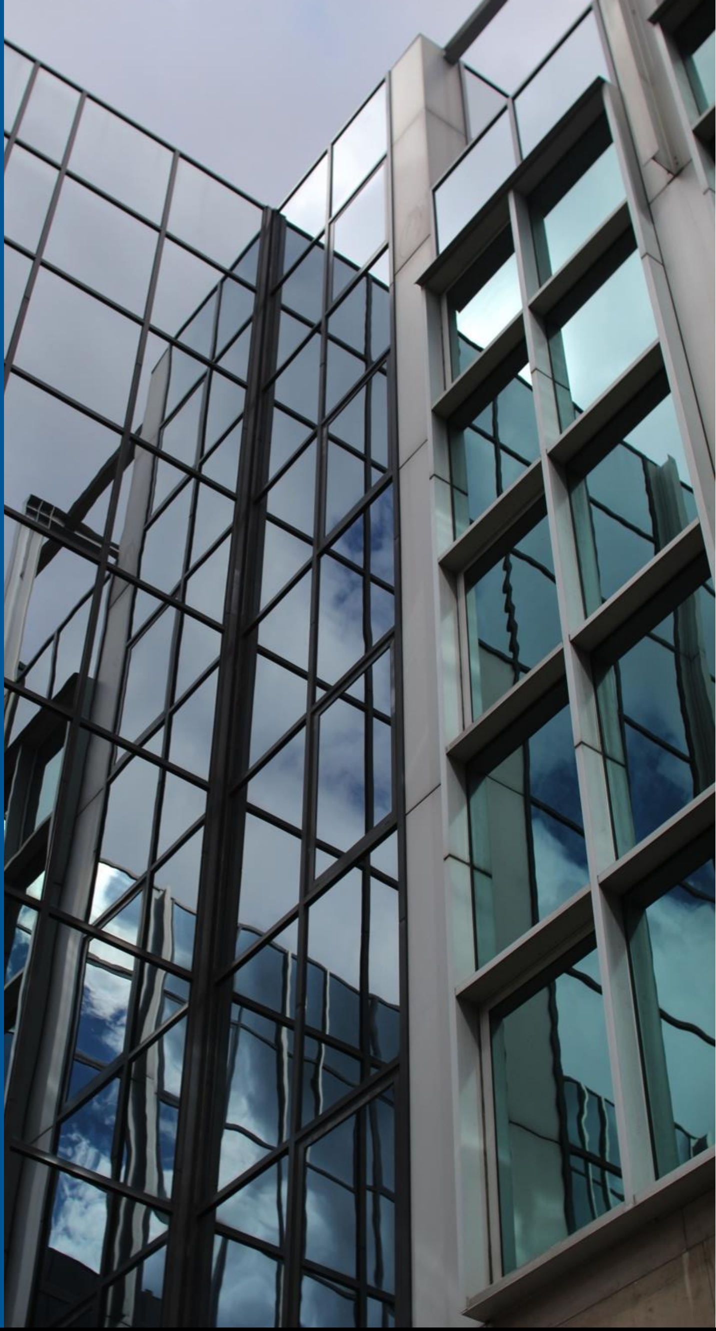
# Multi Tasking and Time Saving


I DON'T GET YOUR CODE. WHAT ARE THESE LINES FOR?
geek & poke
I HAVE NO IDEA. BUT IT DOES NOT WORK WITHOUT THEM
THE ART OF PROGRAMMING - PART 2: KISS

- Rapidly execute a wide array of commands
- Multiple scripts running asynchronously
- Monitor multiple systems at the same time
- Can execute command from defined decision trees

Fundamental of Scripting

# Scripting Language Types



# Language Types

**Glue Languages**

- Acts as the conduit between systems and software
- Most Scripting Languages fall within this category
- Performs a wide array of system functions

**Shell Scripting**

- Designed to be executed as command line interface
- Automated system calls
- Allows remote capability

**GUI Scripting**

- Performs actions a user would make
- Automate user actions
- Testing apps

**Application Specific**

- Designed by developers to interact directly with application
- Mirrors command line interface

**Extension/Embeddable**

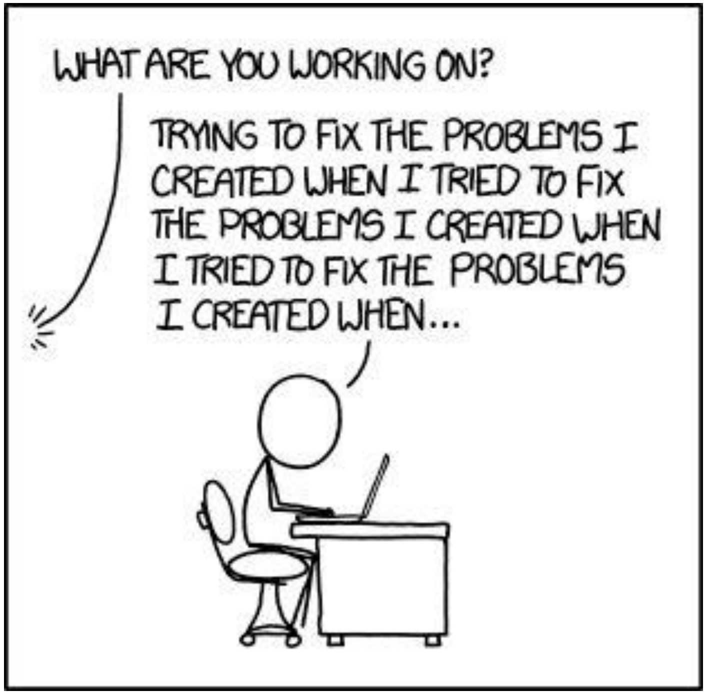
- Hooks – generic means of interacting with an application
- Creates a translation between multiple languages ex: JavaScript and ECMAScript

Scripting Language Types

# Bash (.sh)

- Unix shell written in C
- Shell Scripting Language
- Functional language
- not compiled but interpreted
- Results(if any) of command calls are strings can be displayed in terminal, piped into another command, assigned to variable, or ignored

# Batch (.bat)

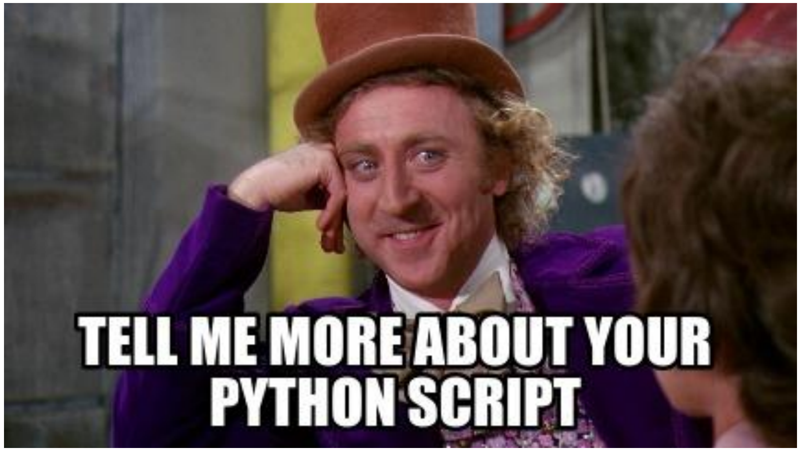

WHAT ARE YOU WORKING ON?
TRYING TO FIX THE PROBLEMS I CREATED WHEN I TRIED TO FIX THE PROBLEMS I CREATED WHEN I TRIED TO FIX THE PROBLEMS I CREATED WHEN...

- Windows Shell Scripting
- File is in plain text
- Executes any command that can be executed on CLI
- not compiled but interpreted
- Results(if any) of command calls are strings can be displayed in terminal, piped into another command, assigned to variable, or ignored

# PowerShell (.ps1)

- Microsoft Command-line Shell open source shell language
- Multi platform (macOS, CentOS, Ubuntu)
- Executed a mixture of cmdlets, scripts, and executables
- Pure object oriented scripting language
- Supports piping and object creation
- Modern Scripting Language

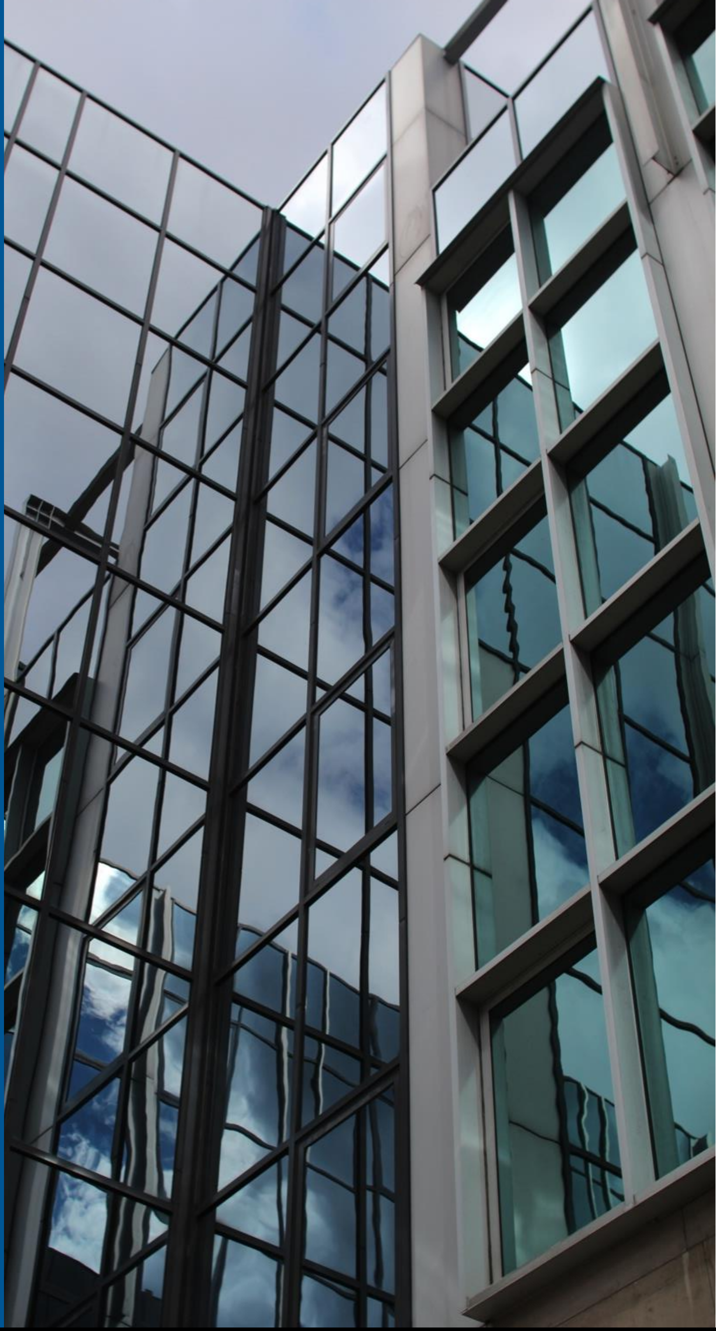
# Python (.py)



- High level programming language
- General purpose language
- Object-Oriented, functional, and procedural language
- Not a true scripting language
- Interacts with any system
- Libraries that support scripting functionality
- Designed to be easily used, read, and learned
- Large development community

Fundamental of Scripting

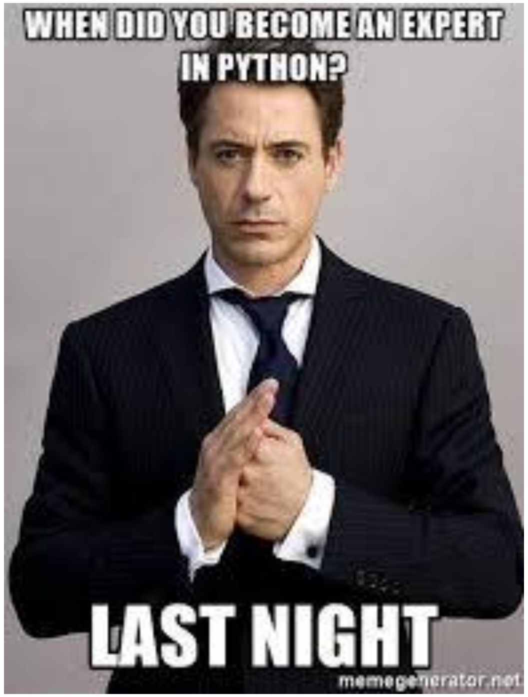
# CyberLeapFwd Scripting Course



# Packet Capture Analysis w/ Python

- Beginner
- Introduction/Tutorial to Python
- Teaches the basics of Python and how to create your of application
- Upon completion students will have created an application that identified possible systems within a packet capture (pcap)

# Network Flow Analysis w/ Python



- Intermediate
- Students have experience with Python
- Little to no instruction
- Creates a passive network scanning application to identify system and system capability

# Windows Filesystem Scanning w/ PowerShell

- Beginner
- Introduction/Tutorial to PowerShell
- Teaches the basics of PowerShell scripting and cmdlets
- Upon completion students will have created an application that establishes a baseline of a directory within the Windows filesystem

# Host Intrusion Detection with PowerShell

YOU MIGHT BE A POWERSHELL EXPERT
BUT YOU STILL DIDN'T CATCH THAT RED DOT I WAS TALKING ABOUT
memegenerator.net

- Intermediate
- Students have experience with PowerShell
- Little to no instruction
- Creates a Host Intrusion Detection script that monitors a Windows system network, running processes, filesystem, and registry

# Conclusion

Questions?

I LOVE ALL THE SCRIPTS
JAVA SCRIPT, COFFEE SCRIPT, VB SCRIPT, APPLE SCRIPT, BASH SCRIPT, TYPE SCRIPT
memegenerator.net