Glossary

IT Automation with Python

Terms and definitions from all courses

A

A/B testing: A way to compare two versions of something to find out which version performs better

Absolute path: A full path to the resource in the file system

Activity monitor: Mac OS tool that shows what's using the most CPU, memory, energy, disk, or network

Alteration: RegEx that matches any one of the alternatives separated by the pipe symbol

API endpoint: The part of the program that listens on the network for API calls

Application Programming Interface (API) key: This is an authentication token that calls an API, which is then called to identify the person, programmer, or program trying to access a website

Artifact: A byproduct of the software development process that can be accessed and used, an item produced during programming

Automation: The process of replacing a manual step with one that happens automatically, essential tool for keeping up with the infrastructure needs of a growing business

Automatic scaling: This service uses metrics to automatically increase or decrease the capacity of the system

Automatic testing: A process where software checks itself for errors and confirms that it works correctly

Autoscaling: Allows the service to increase or reduce capacity as needed, while the service owner only pays for the cost of the machines that are in use at any given time

B

Backreference: This is applied when using `re.sub()` to substitute the value of a capture group into the output

Bandwidth: How much data can be sent or received in a second

Bash: The most commonly used shell on Linux

Bash script: A script that contains multiple commands

Binary search: A search algorithm used to find a specific item in a sorted list or array by repeatedly dividing the search space in half until the desired item is found or determined to be absent

Bisecting: Dividing in two, also a Git command

Black-box tests: A test where there is an awareness of what the program is supposed to do but not how it does it

Branch: A pointer to a particular commit, representing an independent line of development in a project

Break: A way to exit out of a loop before the loop's condition is false

Breakpoints: Debugging features that lets code run until a certain line of code is executed

Built-in functions: Functions that exist within Python and can be called directly

C

Cache: This stores data in a form that's faster to access than its original form

Capacity: How much the service can deliver

Centralized logs collection: This means there's a special server that gathers all the logs from all the servers, or even all computers in the network

Character classes: These are written inside square brackets and let us list the characters we want to match inside of those brackets

Character ranges: Ranges used to match a single character against a set of possibilities

CI/CD: The name for the entire continuous integration and continuous deployment system

Client-side scripting language: Primarily for web programming; the scripts are transferred from a web server to the end-user's internet browser, then executed in the browser

Code editors: Tools to provide features, including syntax highlighting, automatic indentation, error checking, and autocompletion

Code reviews: The deliberate and methodical gathering of other programmers to examine each other's code for errors to increase the code quality and reduces the amount of bugs

Cold data: Accessed infrequently and stored in cold storage

Comma separated values (CSV): A very common data format used to store data as segment of text separated by commas

Command line arguments: Inputs provided to a program when running it from the command line

Comments: Notes to yourself and/or other programmers to make the purpose of the code clear

Communications lead: The lead person who needs to receive timely important communication updates

Commit: A command to make edits to multiple files and treat that collection of edits as a single change

Commit files: A stage where the changes made to files are safely stored in a snapshot in the Git directory

Commit ID: An identifier next to the word commit in the log

Commit message: A summary and description with contextual information on the parts of the code or configuration of the commit change

Compiled or compiled language: Supportable code that can be executed on different platforms

Computer program: A step-by-step list of instructions that a computer follows to reach an intended goal

Computer protocols: Guidelines published as open standards so that any given protocol can be implemented in various products

Configuration management: Automation technique that manages the configuration of computers at scale

Containers: Applications that are packaged together with their configuration and dependencies

Container registry: A storage location for container images, organized for efficient access

Container repository: A container registry that manages container images

Content Delivery Networks (CDN): A network of physical hosts that are geographically located as close to the end users as possible

Continuous delivery: Any changes to the software are tested and then deployed to users and servers as soon as they are verified

Continuous deployment: Automates the deployment of code to production

Continuous integration: Constantly adding updates and improvements to software

Continuous deployment (CD): New code is deployed often after it has been automatically built and tested

Continuous integration (CI): A system that will automatically build and test our code every time there's a change

Control statements: Programming constructs that direct the flow of execution of a program by allowing you to make decisions, repeat actions, or choose between different code paths based on specific conditions

Core files: Files that store all the information related to the crash to debug the issue

Cut: A command that can split and take only bits of each line using spaces

D

Data types: Classes of data (e.g., string, int, float, Boolean, etc.), which include the properties and behaviors of instances of the data type (variables)

Data serialization: The process of taking an in-memory data structure, like a Python object, and turning it into something that can be stored on disk or transmitted across a network

Debuggers: Tools that follow the code line by line, inspect changes in variable assignments, interrupt the program when a specific condition is met, and more

Debugging: The process of identifying, analyzing, and removing bugs in the actual code of a system in the application

Decorator: Used in Python to add extra behavior to functions without having to modify the code

DevOps: Describes the steps of the software development lifecycle beyond writing code, the union between the development team and the operations team

DevSecOps: Adding security testing and protection to the software development lifecycle

Dialects: Rules that define how a CSV file is structured

Dictionaries: A data type used to organize elements into collections, taking the form of pairs of keys and values

Diff: A command to find the differences between two files

Distributed: Each developer has a copy of the whole repository on their local machine

Distributed systems: Also referred to as distributed computing or distributed databases, utilize different nodes to interact and synchronize over a shared network

Disk image: A snapshot of a virtual machine's disk at a given point in time

Docstrings: Documentation that lives alongside the code

Docker: An open-source tool used to build, deploy, run, update, and manage containers

Domain-Specific Language (DSL): A programming language that's more limited in scope

DNS zone file: A configuration file that specifies the mappings between IP addresses and host names in your network

E

Edge cases: Inputs to code that produce unexpected results, found at the extreme ends of the ranges of input

Environment variables: Settings and data stored outside a program that can be accessed by it to alter how the program behaves in a particular environment

Ephemeral storage: Storage used for instances that are temporary and only need to keep local data while they're running

Error budgets: Represented as the maximum amount of time that a program is able to fail without violating an agreement

Executor: This is the process that's in charge of distributing the work among the different workers

Exhausted: When resources are used completely and programs are getting blocked by not having more access to those resources

Expensive actions: Actions that can take a long time to complete

Explicit conversion: This occurs when code is written to manually convert one data type to another using a data type conversion function

Expression: A combination of numbers, symbols, or other values that produce a result when evaluated

F

Facts: Variables that represent the characteristics of the system

Fast-forward merge: A merge when all the commits in the checked out branch are also in the branch that's being merged

File systems: Methods and structures used to organize and control how data is stored and accessed

Fix up: The decision to discard commit messages for that commit

Flask: A Python library that makes it easier to create web applications and REST web services

For loop: This executes a block of code for a specified number of iterations or over a collection of items

Forking: A way of creating a copy of the given repository so that it belongs to our user

Functions: A reusable block of code that performs a specific task

Futures: A module provides a couple of different executors, one for using threads and the other one for using processes

G

Garbage collector: A tool in charge of freeing the memory that's no longer in use

Git: A free open source version control system available for installation on Unix based platforms, Windows and macOS

GitHub: A web-based Git repository hosting service, allowing users to share and access repositories on the web and copy or clone them to a local computer

Git directory: A database for a Git project that stores the changes and the change history

Git log: A log that displays commit messages

Git staging area: A file maintained by Git that contains all the information about what files and changes are going to go into the next commit

Globs: Characters that create list of files, like the star and question mark

grep: An especially easy to use yet extremely powerful tool for applying RegExes

H

Head: This points to the top of the branch that is being used

Hot data: Accessed frequently and stored in hot storage

Hybrid cloud: A mixture of both public and private clouds

I

IDE: A software application that provides comprehensive facilities for software development

Implicit conversion: This occurs when the Python interpreter automatically converts one data type to another

Incident commander (incident controller): The person who needs to look at the big picture and decide what's the best use of the available resources

Indirect merges: GitHub can merge a pull request automatically if the head branch is directly or indirectly merged into the base branch externally

Infinite loop: A sequence that is missing a method for exiting the loop, causing the loop to run forever

Infrastructure as a Service (or IaaS): When a Cloud provider supplies only the bare-bones computing experience

Input: Information that is provided to a program by the end user

Input / Output (I/O): These streams are the basic mechanism for performing input and output operations in your programs

Input/Output Operations Per Second (IOPS): Measures how many reads or writes you can do in one second, no matter how much data you're accessing

Integrated Development Environment (IDE): A code editor with extra capabilities to simplify script writing

Interpreter: The program that reads and executes code

Interpreter or interpreted language: An intermediary program used to execute the instructions specified in the code

Issue tracker (bug tracker): A tracker that shows tasks that need to be done, the state they're in and who's working on them

Iterators: Variables that allow you to loop through a collection one item at a time

J

JSON: A data-interchange format used in RESTful APIs to facilitate communication between clients and servers

K

Kernel: The main core of an operating system that talks directly to hardware and manages the system's resource

Kubernetes: An open-source platform that gives programmers the power to orchestrate containers

L

Latency: The delay between sending a byte of data from one point and receiving it on the other

Linear search: The process of searching each line of data until the desired data entry is located

Linux: An open source operating system where the software is free to share, modify, and distribute

Lists: Sequences of elements

List comprehensions: Create new lists based on sequences or ranges

Load balancer: Ensures that each node receives a balanced number of requests

Log files: Log files are records or text files that store a history of events, actions, or errors generated by a computer system, software, or application for diagnostic, troubleshooting, or auditing purposes

Logic errors: Errors in code that prevent it from running correctly

Logical operators: Operators used to combine or manipulate boolean values (True or False) to create complex conditions for decision-making

Lookahead: RegEx that matches a pattern only if it's followed by another pattern

Loop: A sequence that makes the computer do repetitive tasks

M

Machine language: Lowest-level computer language. It communicates directly with computing machines in binary code (ones and zeros)

Mac OS: Operating system developed by Apple

Manual scaling: Changes are controlled by humans instead of software

Master: The default branch that Git creates for when a new repository initialized, commonly used to place the approved pieces of a project

Memory leak: This happens when a chunk of memory that's no longer needed is not released

Memory profiler: A tool used to figure out how the memory is being used

Merge: An operation that merges the origin/master branch into a local master branch

Merge commits: All commits from the feature branch are added to the base branch

Merge conflict: This occurs when the changes are made on the same part of the same file, and Git won't know how to merge those changes

Modified files: A stage where changes have been made to a file, but the have not been stored or committed

Mode: The format controlling what you can do with a recently opened file

Multi-cloud: A mixture of public and/or private clouds across vendors

N

NALSD (Non-Abstract Large System Design): A discipline and process introduced by Google, primarily aimed at empowering site reliability engineers (SREs) to assess, design, and evaluate large-scale systems

Naming conventions: Functions, classes and methods with naming conventions to understand what to expect from them

O

Object storage: Storage where objects are placed and retrieved into a storage bucket

Observer effect: The idea that observing a phenomenon alters the phenomenon

Object-oriented programming language: Most coding elements are considered to be objects with configurable properties

Operating system (OS): Software that manages everything that goes on in the computer, composed of two main parts: the kernel and the user space

Orchestration: The automated configuration and coordination of complex IT systems and services

Output: the end result of a task performed by a function or computer program

P

Parameter (argument): A value passed into a function for use within the function, controlling the behavior of the CSV reader and writer

Pass: A placeholder statement which is used when the syntax requires a statement, but you don't want to execute any code or command

Patch: A command that can detect that there were changes made to the file and will do its best to apply the changes

Persistent storage: Storage used for instances that are long lived and need to keep data across reboots and upgrades

Pipes: A process of connecting the output of one program to the input of another

Piping: A process of connecting multiple scripts, commands, or other programs together into a data processing pipeline

Pipelines: The specific steps that need to run to obtain the desired result

Platform as a Service (or PaaS): When a Cloud provider offers a preconfigured platform to the customer

Platform-specific scripting language: Language used by system administrators on those specific platforms

Private key: A secret and secure cryptographic key that must be kept confidential and protected and is used to decrypt data that has been encrypted with the corresponding public key

Programming: The process of writing a program to behave in different ways

Programming code: A set of written computer instructions, guided by rules, using a computer programming language

Programming languages: Language with syntax and semantics to write computer programs

Pod: A group of one or more containers that are scheduled and run together

Pointers: The variables that store memory addresses

Postmortems: Documents that describe details of incidents to learn from mistakes

Private cloud: When your company owns the services and the rest of your infrastructure

Production: The software is pushed out to the end users from a cloud server

Profiler: A tool that measures the resources the code is using to see how the memory is allocated and how the time is spent

Public cloud: The cloud services provided to you by a third party

Public key: A safety cryptographic structure frequently employed to establish secure communication through data encryption or to validate the authenticity of a digital signature

Pull request: A procedure where new code is examined before it is merged to create a branch or master branch

Puppet: The current industry standard for configuration management, also known as the client

Puppet master: Known as the Puppet server

Python: A general purpose programming language

Python interpreter: Program that reads and executes Python code by translating Python code into computer instructions

Pytest: A powerful Python testing tool that assists programmers in writing more effective and stable programs

Q

Qwiklabs: An online learning environment or virtual machine to simulate real-world scenarios

R

Rate limits: Prevent one service from overloading the whole system

Reader objects: Object that represents an element or entity within a scene that needs to be rendered to the screen

Rebasing: The base commit that's used for a branch is changed

Real time: The amount of actual time that it took to execute the command

Recursion: The repeated application of the same procedure to a smaller problem

Redirection: A process of sending a stream to a different destination

Refactoring: When a code is updated to be more self-documenting and clarify the intent

Reference images: Store the contents of a machine in a reusable format

Registry: A place where containers or artifacts are stored and organized

Regular expression: A search query for text that's expressed by string pattern, also known as RegEx or RegExp

Relative path: A portion of a path to show where the resource is located in relation to the current working directory

Remote branches: Git uses read-only branches to keep copies of the data that's stored in the remote repository

Remote repositories: Repositories that allow developers to contribute to a project from their own workstations making changes to local copies of the project independently of one another

Repository: An organization system of files that contain separate software projects

Reproduction case: A clear description of how and when the problem appears, a way to verify if the problem is present or not

Resource Monitor (or Performance Monitor): Windows OS tool that shows what's using the most CPU, memory, energy, disk, or network

REST (Representational State Transfer): Every request carries all the parameters and data needed for the server to satisfy that request

RESTful APIs: Rely on the HTTP protocol, can be further secured using HTTPS, and API endpoints can authenticate users via authorization tokens, API keys, or other security mechanisms

REST architecture: An architectural style for designing networked applications and web services

Return value: This is the value or variable returned as the end result of a function

Richardson Maturity Model (RMM): A framework that categorizes and describes different levels of implementation for RESTful APIs based on their adherence to the six constraints

Rollback: The act of reverting changes made to software to a previous state

S

Script: Often used to automate specific tasks

Secure Shell (SSH): A robust protocol for connecting to servers remotely

Semantics: The intended meaning or effect of statements, or collections of words, in both human and computer languages

Service-level agreements (SLAs): An agreement between a vendor and its clients or users that can be legally binding

Service-level objectives (SLOs): A specific and measurable target that defines the level of performance, reliability, or quality a service should consistently deliver

Shell: The application that reads and executes all commands

Signals: Tokens delivered to running processes to indicate a desired action

Source Control Management (SCM): A tool similar to VCS to store source code

Software as a Service (or SaaS): When a Cloud provider delivers an entire application or program to the customer

Software testing: A process of evaluating computer code to determine whether or not it does what is expected

Standard input stream commonly (STDIN): A channel between a program and a source of input

Standard output stream (STDOUT): A pathway between a program and a target of output, like a display

Standard error (STDERR): This displays output like standard out, but is used specifically as a channel to show error messages and diagnostics from the program

Stage files: A stage where the changes to files are ready to be committed

Staging: A strategic DevOps approach where we specify the build steps and tests

Sticky sessions: All requests from the same client always go to the same backend server

String: A data type used to represent a piece of text. sequences of characters and are immutable

SSH client: This establishes a connection to the SSH server, ensuring a secure interaction, where the client makes access requests

SSH key: An access credential

SSH protocol: Standard commonly used for logging in to servers remotely on the principle of public-key encryption

SSH server: This establishes secure network connections, undergoes mutual authentication, and initiates encrypted login sessions or file transfers

Squash commits: The decision add commit messages together and an editor opens to make any necessary changes

Subprocesses: A process to call and run other applications from within Python, including other Python scripts

Swap: A space in the hard drive where the operating system puts the parts of the memory that aren't currently in use

Syntax: The rules for how each statements are constructed in both human and computer languages

Sys time: The time spent doing system level operations

System calls: The calls that the programs running on our computer make to the running kernel

T

Technical debt: The pending work that accumulates when a quick-and-easy solution is applied instead of a sustainable long-term one

Templating: The process of capturing all of the system configuration to let us create VMs in a repeatable way

Test case: This is the individual unit of testing that looks for a specific response to a set of inputs

Test fixture: This prepared to perform one or more tests

Test suite: This is used to compile tests that should be executed together

Test runner: This runs the test and provides developers with the outcome's data

Threads: Run parallel tasks inside a process

Three-way merge: A merge when the snapshots at the two branch tips with the most recent common ancestor, the commit before the divergence

Throughput: The amount of data that you can read and write in a given amount of time

Tracked: A file's changes are recorded

Traffic shaping: This is a way of marking the data packets sent over the network with different priorities, to avoid having huge chunks of data use all of the bandwidth

Troubleshooting: The process of solving any kind of problem in the system running the application

Tuples: Sequences of elements of any type that are immutable, written parentheses instead of square brackets

U

Undefined behavior: The code is doing something that's not valid in that programming language

unittest: A set of Python tools to construct and run unit tests

Unit tests: A test to verify that small isolated parts of a program work correctly

Untracked: A file's changes are not recorded

User space: Everything outside of the kernel that users interact with directly

User time: The time spent doing operations in the user space

Utilization limits: Cap the total amount of a certain resource that you can provision

V

Valgrind: A powerful tool that can tell if the code is doing any invalid operations, no matter if it crashes or not

Variables: These are used to temporarily store changeable values in programming code

Version control systems (VCS): A tool to safely test code before releasing it, allow multiple people collaborate on the same coding projects together, and stores the history of that code and configuration

Virtual environment: A tool that allows you to create isolated environments for your Python projects

Virtual machine (VM): A computer simulated through software

W

Watchdog: This is another process that checks whether a program is running and, when it's not, starts the program again

Web application: An application that you interact with over HTTP

While loop: This is used when a segment of code needs to execute repeatedly while a condition is true

White-box test: A test where test creator knows how the code works and can write test cases that use the understanding to make sure it performs as expected

Wildcard: A character that can match more than one character

Windows OS: Operating system developed by Microsoft

Wrapper: A function or program that provides a compatibility layer between two functions or programs, so that they can work well together

Writer objects: The capability to write data to a CSV file