Module 1

1 Glossary: Python Basics

This alphabetized glossary contains many of the terms you'll find within this course. This comprehensive glossary also includes additional industry-recognized terms not used in course videos. These terms are important for you to recognize when working in the industry, participating in user groups, and engaging in other certificate programs.

1.1 A

- **AI**: Artificial intelligence is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings.
- **Application Development**: The process of planning, designing, creating, testing, and deploying a software application to perform various business operations.
- **Arithmetic Operations**: Basic calculations like addition, subtraction, multiplication, and division, also known as algebraic or mathematical operations.
- **Array of Numbers**: A set of numbers or objects that follow a pattern, presented as rows and columns to explain multiplication.
- **Assignment Operator in Python**: A binary operator (=) that assigns a value to a variable.
- **Asterisk**: Symbol (*) used to perform various operations in Python.

1.2 B

- **Backslash**: An escape character (\) used in Python strings to treat the following character in a special way.
- **Boolean**: A system of algebraic notation using binary digits 0 (False) and 1 (True).

1.3 C

- **Colon**: Used to represent indented blocks, and to fetch data or index ranges in arrays.
- **Concatenate**: To link things together in a chain or series.

1.4 D

- **Data Engineering**: Field focused on turning raw data into usable information through blending, testing, and optimizing data.
- **Data Science**: Interdisciplinary field focused on extracting knowledge from large datasets, preparing data, and presenting findings for decision-making.
- **Data Type**: Refers to the type of value a variable has, defining what operations can be applied without errors.
- **Double Quote**: Symbol (" ") used to represent strings in Python.

1.5 E

- **Escape Sequence**: A sequence of characters starting with an escape character to perform special functions.
- **Expression**: A combination of operators and operands that evaluates to a value.

1.6 F

- **Float**: A data type representing floating-point numbers.
- **Forward Slash**: Symbol (/) used for division and other operations in Python.
- **Foundational**: Denoting an underlying basis or principle; fundamental.

1.7 I

- **Immutable**: Objects (like int, float, bool, string, tuple) that cannot be changed once created.
- **Integer**: Whole numbers, positive, negative, or zero.

1.8 M

- **Manipulate**: Modifying or creating new strings by altering existing ones.
- **Mathematical Conventions**: Generally agreed-upon facts, notations, or usage in mathematics.
- **Mathematical Expressions**: Statements involving numbers or variables connected by operators.
- **Mathematical Operations**: Calculating values using operands and operators.

1.9 N

- **Negative Indexing**: Accessing elements from the end of a sequence using negative numbers.

1.10 O

- **Operands**: Quantities on which operations are performed.
- **Operators in Python**: Symbols used to perform operations on variables and values.

1.11 P

- **Parentheses**: Used to call an object.

1.12 R

- **Replicate**: To make an exact copy.

1.13 S

- **Sequence**: Formally defined as a function whose domain is an interval of integers.
- **Single Quote**: Symbol (' ') used to represent strings in Python.
- **Slicing in Python**: Technique to extract portions of a list or string.
- **Special Characters**: Characters not considered letters or digits, such as symbols or punctuation.
- **Stride Value**: The number of bytes from one row of pixels to the next in memory.
- **Strings**: Arrays of Unicode characters.
- **Substring**: A sequence of characters within a larger string.

1.14 T

- **Type Casting**: Converting one data type to another (also called Type Conversion or Coercion).
- **Types in Python**: Categories of data items, such as integers, floats, strings, and Booleans.

1.15 V

- **Variables**: Containers for storing data values.

Module 2

2 Glossary: Python Data Structures

Welcome! This alphabetized glossary contains many of the terms in this course. It also includes additional industry-recognized terms important for working in the industry, participating in user groups, and other certificate programs.

2.1 A

2.1.1 Aliasing

Aliasing refers to giving another name to a function or a variable.

2.1.2 Ampersand

A character typically "&" standing for the word "and."

2.2 C

2.2.1 Compound Elements

Compound statements contain (groups of) other statements; they affect or control the execution of those other statements in some way.

2.3 D

2.3.1 Delimiter

A delimiter in Python is a character or sequence of characters used to separate or mark the boundaries between elements or fields within a larger data structure, such as a string or a file.

2.3.2 Dictionaries

A dictionary in Python is a data structure that stores a collection of key-value pairs, where each key is unique and associated with a specific value.

2.4 F

2.4.1 Function

A function is a block of code, defining a set of procedures, which is executed only when it is called.

2.5 I

2.5.1 Immutable

Immutable objects are of built-in datatypes like int, float, bool, string, Unicode, and tuple. These objects cannot be changed after creation.

2.5.2 Intersection

The intersection of two sets is a new set containing only the elements that are present in both sets.

2.6 K

2.6.1 Keys

The keys() method in Python Dictionary returns a view object that displays a list of all the keys in the dictionary in order of insertion.

2.7 L

2.7.1 Lists

A list is any list of data items, separated by commas, inside square brackets.

2.7.2 Logic Operations

In Python, logic operations refer to the use of logical operators such as "and," "or," and "not" to perform logical operations on Boolean values (True or False).

2.8 M

2.8.1 Mutable

Mutable objects in Python are objects whose values can be changed after they are created. These objects allow modifications such as adding, removing, or altering elements without creating a new object.

2.9 N

2.9.1 Nesting

A nested function is simply a function within another function and is sometimes called an "inner function."

2.10 R

2.10.1 Ratings in Python

Ratings in Python typically refer to a numerical or qualitative measure assigned to something to indicate its quality, performance, or value.

2.11 S

2.11.1 Set Operations

Set operations in Python refer to mathematical operations performed on sets, which are unordered collections of unique elements.

2.11.2 Sets in Python

A set is an unordered collection of unique elements.

2.11.3 Syntax

The rules that define the structure of the Python language.

2.12 T

2.12.1 Tuples

Used to store multiple items in a single variable.

2.12.2 Type Casting

In Python, type casting means converting one data type to another.

2.13 V

2.13.1 Variables

A variable is a symbolic name or identifier used to store and manipulate data. Variables serve as containers for values of various data types, including numbers, strings, lists, and more.

2.13.2 Venn Diagram

A graphical representation that uses overlapping circles to illustrate the relationships and commonalities between sets or groups of items.

2.13.3 Versatile Data

Versatile data refers to data that can be used in multiple ways, adaptable to different applications or purposes, and not restricted to a specific use case.

Module 3

3 Glossary: Python Programming Fundamentals

This alphabetized glossary contains many of the terms you'll find within Python for AI. It also includes additional industry-recognized terms important for recognizing when working in the industry, joining user groups, or pursuing other certificate programs.

3.1 Glossary Terms

3.1.1 Analogy

Refers to a concept or comparison outside the scope of the programming language itself, used to explain or relate one concept to another in a more understandable way.

3.1.2 Attributes

Attributes in Python refer to the characteristics or properties of an object, and they can be accessed using dot notation.

3.1.3 Branching

Branching in Python is a process of altering the flow of a program based on conditions, typically using `if`, `elif`, and `else` statements.

3.1.4 Comparison Operators

Comparison operators in Python are used to compare values and return Boolean results (`True` or `False`), including operators like:

- == (equal)
- != (not equal)

- < (less than)
- > (greater than)
- <= (less than or equal to)
- >= (greater than or equal to)

3.1.5 Conditions

Conditions in Python are used to make decisions in code, executing specific blocks of code based on whether a given expression evaluates to True or False.

3.1.6 Enumerate

In Python, enumerate is a built-in function that adds a counter to an iterable, allowing you to loop through both the elements and their corresponding indices.

3.1.7 Exception Handling

Exception handling in Python is a mechanism for gracefully managing and responding to errors or exceptional conditions that may occur during program execution.

3.1.8 Explicitly

In Python, the term "explicitly" refers to performing an action or specifying something in a clear, unambiguous, and direct manner.

3.1.9 For Loops

For loops in Python are used for iterating over a sequence (such as a list, tuple, or string) or other iterable objects, executing a set of statements for each item in the sequence.

3.1.10 Global Variable

Global variables in Python are variables defined outside of any function or block and can be accessed and modified from any part of the code.

3.1.11 Incremented

"Incremented" in Python means to increase the value of a variable by a specified amount, typically done using the += operator or by adding a fixed value.

3.1.12 Indent

In Python, "indent" refers to the use of whitespace at the beginning of a line to signify the structure and scope of code blocks, such as loops and functions.

3.1.13 Indices

In Python, "indices" refer to the position or location of elements in a sequence, like a string, list, or tuple, starting with 0 for the first element.

3.1.14 Iterate

In Python, "iterate" means to repeatedly perform a set of operations or steps on each item in a collection, such as a list, tuple, or dictionary, typically using loops or iterators.

3.1.15 Local Variables

Local variables in Python are variables defined within a specific function or block of code and are only accessible within that function or block.

3.1.16 Logic Operators

Logic operators in Python are used to perform logical operations on Boolean values, including:

- and (logical AND)
- or (logical OR)
- not (logical NOT)

3.1.17 Loops

Loops in Python are constructs for repeating a block of code, enabling the execution of the same code multiple times.

3.1.18 Parameters

Parameters in Python are placeholders in a function definition, used to accept and work with values provided to the function when it is called.

3.1.19 Programming Fundamentals

Programming fundamentals in Python involve variables, control structures, functions, data structures, input/output, and error handling for building software.

3.1.20 Range Function

The range function in Python generates a sequence of numbers that can be used for iterating in a loop. Typically used as range(start, stop, step), it creates numbers from start to stop-1 with the given step increment.

3.1.21 Scope of Function

The "scope of a function" in Python refers to the region of code where a variable defined within that function is accessible or visible.

3.1.22 Sequences

Sequences in Python are ordered collections of items that can include data types like strings, lists, and tuples, allowing for indexing and iteration.

3.1.23 Syntax

In Python, "syntax" refers to the set of rules that dictate how code must be written and structured to be correctly interpreted by the Python interpreter. It includes correct use of keywords, indentation, operators, and punctuation.

3.1.24 While Loops

While loops in Python are used to repeatedly execute a block of code as long as a specified condition is true.

Module 4

4 Glossary: Working with Data in Python

This alphabetized glossary contains many of the terms you'll find in this content. It also includes additional industry-recognized terms that are essential for professionals working in data analysis, data science, and related fields.

4.1 A

4.1.1 .csv file

A .csv (Comma-Separated Values) file is a plain text file format for storing tabular data, where each line represents a row and uses commas to separate values in different columns.

4.1.2 .txt file

A .txt (Text) file is a common file format that contains plain text without specific formatting, suitable for storing and editing textual data.

4.1.3 Append

To *append* means to add or attach something to the end of an existing object, typically used in the context of adding data to a file or elements to a data structure like a list in Python.

4.1.4 Attribute

An *attribute* in Python refers to a property or characteristic associated with an object, which can be accessed using dot notation.

4.2 B

4.2.1 Broadcasting in NumPy

Broadcasting in NumPy allows arrays with different shapes to be combined in element-wise operations by automatically extending smaller arrays to match the shape of larger ones, enabling flexible computations.

4.3 C

4.3.1 Component

In NumPy, a *component* refers to a specific element or value within a multi-dimensional array, accessed using indexing.

4.3.2 Computation

Computation in NumPy involves performing numerical operations on arrays and matrices, making it a powerful library for mathematical and scientific computing in Python.

4.4 D

4.4.1 Data Analysis

Data analysis is the process of inspecting, cleaning, transforming, and interpreting data to extract useful insights, draw conclusions, and support decision-making.

4.4.2 DataFrames

A *DataFrame* in Pandas is a two-dimensional, tabular data structure for storing and analyzing data, consisting of rows and columns.

4.4.3 Dependencies

Dependencies in Pandas refer to external libraries or modules, such as NumPy, that Pandas relies on for core data manipulation and analysis functionalities.

4.5 F

4.5.1 File Attribute

File attributes refer to properties or metadata associated with files, such as file size, creation date, and permissions, managed at the operating system level.

4.5.2 File Object

A *file object* in Python represents an open file, allowing reading from or writing to the file.

4.6 G

4.6.1 Grid

In Python, a *grid* refers to a two-dimensional structure composed of rows and columns, often used to represent data in a tabular or coordinate format.

4.7 H

4.7.1 Hadamard Product

The Hadamard product is an element-wise multiplication of two matrices or arrays of the same shape, resulting in a new matrix with each element being the product of corresponding elements.

4.8 I

4.8.1 Importing Pandas

To import Pandas in Python, use the command: `import pandas as pd`, which allows access to Pandas functions and data structures via the abbreviation `pd`.

4.8.2 Index

An *index* refers to a position or identifier used to access elements within a sequence or data structure such as a list, string, or DataFrame.

4.9 L

4.9.1 Libraries

Libraries in Python are collections of pre-written code modules that provide reusable functions and classes to simplify and accelerate software development.

4.9.2 Linspace

In Python, *linspace* refers to a NumPy function that generates an array of evenly spaced values within a specified range.

4.10 N

4.10.1 NumPy

NumPy is a fundamental Python library for numerical computing that supports large, multi-dimensional arrays and provides a variety of high-level mathematical functions for efficient computation.

4.10.2 One-Dimensional NumPy

A one-dimensional NumPy array is a linear data structure that stores elements in a single sequence, commonly used for numerical operations and data manipulation.

4.11 O

4.11.1 Open Function

In Python, the open() function is used to access and manipulate files, enabling reading from or writing to a specified file.

4.12 P

4.12.1 Pandas

Pandas is a powerful Python library for data manipulation and analysis, offering data structures and tools for working with structured data such as tables and time series.

4.12.2 Pandas Library

The Pandas library consists of multiple modules and functions that facilitate efficient handling and analysis of structured datasets.

4.12.3 Plotting Mathematical Functions

Plotting mathematical functions in Python involves using libraries like Matplotlib to create visual representations of equations and data for easier analysis and interpretation.

4.13 S

4.13.1 Shape

In NumPy, *shape* refers to an array's dimensions (rows and columns), describing its size and structure.

4.13.2 Slicing

Slicing in NumPy allows extracting specific portions of an array by specifying index ranges, enabling work with subsets of data.

4.14 T

4.14.1 Two-Dimensional NumPy

A two-dimensional NumPy array represents data in rows and columns, resembling a matrix or table, ideal for data manipulation and analysis tasks.

4.15 U

4.15.1 Universal Functions (ufuncs)

Universal functions in NumPy are functions that operate element-wise on arrays, providing efficient and vectorized mathematical and logical operations.

4.16 V

4.16.1 Vector Addition

Vector addition in Python involves adding corresponding elements of two or more vectors, resulting in a new vector containing the sum of their components.

4.16.2 Visualizations

Visualizations in Python involve creating graphical representations such as charts, plots, and graphs to illustrate and communicate data trends effectively.

Module 5

5 Glossary: APIs and Data Collection

This alphabetized glossary contains many of the terms you'll find within this course. This comprehensive glossary also includes additional industry-recognized terms not used in course videos. These terms are important for you to recognize when working in the industry, participating in user groups, and engaging in other certificate programs.

5.1 Terms and Definitions

Term	Definition
API Key	A secure access token or code used to authenticate and authorize access to an API or web service, enabling the user to make authenticated requests.
APIs	A set of rules and protocols that enable different software applications to communicate and interact, facilitating the exchange of data and functionality.
Audio file	A digital recording or representation of sound, stored in formats like MP3, WAV, or FLAC, allowing playback and storage of audio content.
Authorize	Granting permission or access to a user or system to perform specific actions or access resources, often related to authentication mechanisms.

Beautiful Soup Objects	Representations of parsed HTML or XML documents in Beautiful Soup, allowing easy navigation and data manipulation.
Bitcoin currency	A decentralized digital currency that operates without a central authority, enabling peer-to-peer transactions on a blockchain network.
Browser	A software application that enables users to access and interact with web content, displaying websites and web applications.
Candlestick plot	A visual representation of stock price movements using rectangles to illustrate open, close, high, and low prices over time.
Client/Wrapper	A software component that simplifies interaction with external services or APIs, providing higher-level functionality for developers.
CoinGecko API	A web service providing cryptocurrency market data, allowing developers to access real-time and historical information for various cryptocurrencies.
DELETE Method	An HTTP request method used to request the removal or deletion of a resource on a web server.
Endpoint	A specific URL or URI that a web service or API exposes to perform a function or access a resource.
File extension	A suffix added to a filename to indicate the file's format or type, used by systems and applications to determine handling.
find_all	A Beautiful Soup method used to search and extract all occurrences of a specified HTML or XML element, returning a list of matches.
GET method	An HTTP request method used to retrieve data from a web server by appending parameters to the URL.
HTML	The standard language for creating and structuring content on web pages using tags.
HTML Anchor tags	HTML elements (<a>) used to create hyperlinks that connect one web page or resource to another.

HTML Tables	Structures used to organize and display data in rows and columns using <table>, <tr>, <th>, and <td> elements.
HTML Tag	A specific code enclosed in angle brackets defining elements within an HTML document.
HTML Trees	The hierarchical structure of an HTML document representing elements and their relationships.
HTTP	The foundation of data communication on the World Wide Web, used for transmitting and retrieving web content.
httplib	A Python library that provides functions and classes to send and handle HTTP and HTTPS requests.
Identify	Determining if two variables or objects refer to the same memory location using the is operator.
Instance	A specific occurrence of an object or class created from a class blueprint, with its own attributes and data.
JSON file	A lightweight data interchange format that stores structured data in a human-readable text format.
Mean value	The average of a set of numerical values, calculated by summing all values and dividing by their count.
Navigable string	A Beautiful Soup object representing a string within an HTML or XML document.
Plotly	A Python library for creating interactive and web-based data visualizations and dashboards.
PNG file	A lossless image format supporting transparency and compression, used for high-quality graphics.
POST method	An HTTP request method used to send data to a web server, commonly for submitting form data or creating resources.
Post request	An HTTP request that sends data to a server for creating or updating resources.
PUT method	An HTTP request method used to update or modify an existing resource on a web server.

Py-Coin-Gecko	A Python library that provides access to cryptocurrency data from the CoinGecko API.
Python iterable	An object that can be looped over, including lists, tuples, and dictionaries.
Query string	A part of a URL that contains data or parameters to be sent to a web server, typically used in GET requests.
rb mode	A file-opening mode in Python used to read files in binary format.
Resource	An external entity such as a file, database connection, or network object managed within a program.
REST API	A web-based interface following REST principles, enabling communication and data exchange over HTTP.
Service instance	An instantiated object representing a service, enabling interaction with that service.
Timestamp	A representation of a specific moment in time used for record-keeping.
Transcribe	The process of converting spoken language or audio into written text using ASR technology.
Unix timestamp	A numerical value representing seconds elapsed since January 1, 1970 (UTC).
URL (Uniform Resource Locator)	A web address that specifies the location of a resource on the internet.
urllib	A Python library for working with URLs and making HTTP requests.
Web service	Software components that enable applications to communicate over the internet using standardized protocols.
Web scraping	The process of extracting data from websites using libraries like Beautiful Soup or Scrapy.
XLSX	A file format for storing spreadsheet data in Excel, containing worksheets, cells, and formulas.

XML	A text-based format for structuring data using tags, often used for data interchange and configuration files.