Python Curriculum

Contents:

1. Python Introduction

- What's Python?
- Why do people use Python?
- Some quotable quotes
- A Python history lesson
- Advocacy News
- What's Python good for?
- What's Python not good for?
- The features list
- Python portability
- Summary

Using the Interpreter

- Python's Interactive Prompt
- Scripting
- Program Execution Model
- Program Architecture: modules
- How to run Python programs
- Using Python IDEs

working with Variables in Python

- Python Variables
- Naming Conventions & Rules
- Types as Objects
- Variable References & Garbage Collection
- Sequence Types
- Membership Statements
- List Iteration
- Sequence Assignments
- Mutable vs Immutable Objects
- Multi Target Assignments

Numeric Operations in Python

- More About Python's Numeric Types
- Numeric Tools

- The Decimal Module
- Operator
- Arithmetic
- Logical
- Relational
- Bitwise
- Special Operators
- Operator Precedence

Decision making & Looping

- Comparison Operations
- The if Statement
- The if Ternary Expression
- The while Loop
- The for Loop

Python Strings

- Generating Strings in Python
- Immutable
- Common String Methods
- Type Conversion in Python
- Formatting String Output
- Format Specifier
- Variable Substitution
- String Indexing
- String Slicing
- String Iteration

Python's Tuples

- Immutable
- Common Tuples Methods
- Tuples Operations
- Tuples Indexing
- Tuples Slicing
- Tuples Iteration
- Multi-Dimensional Tuples (Matrices)

Python's Lists

- Common List Methods
- The range() Function

- List Operations
- String Indexing
- String Slicing
- String Iteration
- Multi-Dimensional Lists (Matrices)

Python List Comprehension

- Basic List Comprehensions
- Compound List Comprehensions

Python set data type

- Understanding & using set data type

Python Dictionaries

- Python Dictionaries
- Assigning Values to Dictionaries
- Dictionary Methods
- Dictionaries vs Lists & Tuples
- Dictionary Indexing
- Dictionary Iteration

14. **Basic Input/Output with Files**

- Opening Files
- Working with Files
- Controlling Output Location

15. Creating Python Functions

- Function Basics
- Defining Functions
- Function Polymorphism
- Argument Defaults
- Lambdas
- Local Variables
- Understanding __built-in__
- Preventing Variable Modifications
- Argument Matching Methods
- Keyword Argument Methods

16. Classes and Objects

- Introduction to OOP using python
- Classes and class attributes
- Instances and instance attributes
- Binding and method invocation

- Composition, Sub-classing and Derivation
- Inheritance
- Built-in functions for classes, instances and other objects
- Privacy and Delegation
- An overview of built-in python classes and modules

17. Modules & Packages

- Module Basics
- Packages
- Package Creation and Importing
- Using __all__ and _ Variables
- Using __name__
- Using third party modules

18. Exceptions

- About Exceptions
- Learning how exceptions work in Depth
    - Handling exceptions
    - Raising exceptions
    - Catching exceptions
- Python's Default Exception Handler
- Using Try/Except/Else/Finally Exceptions
- Generating User Defined Exceptions
- Using Asserts
- Exception Classes

19. Regular Expression in Python

- Using the re module
- Searching with regular expressions
- Replacing with regular expressions
- Reusing regular expressions with recompile
- The match Function
- The search Function
- Regular-expression patterns

21. Multi-threaded Programming

- Starting a New Thread
- The Threading Module
- Creating Thread Using Threading Module

PDBC

- **Introduction to JDBC**
  - Introduction to PDBC
  - CRUD Operations using PDBC

DJANGO

Program Duration:

Contents:

Installation and Introduction to Django

- Learn about python programing (inbuilt data structure & Object oriented Programing)
- Learn and explore various web dev tools like VsCode Editor, Git & Github,
- Sqlite3, Postman, Virtual Environment, DBeaver, and Other Essential Tools
- Install Django framework and it's dependencies
- Setup Django environment
- Create your first sample Django project
- Learn about project structure in Django

Django Admin, Commands and Shell

- Acquire the knowledge to reuse initial built-in Django applications
- Learn about Django admin
- Learn about various Django Commands
- Learn about Django Shell

Routing and Views in Django

- Map web URLs to view functions
- Familiarize with various HTTP methods, including GET, POST, PUT/PATCH, and DELETE
- Create simple views in django with HTTP response or JSON response and learn about different status codes

Templates

- Build Dynamic Django templates that display the HTML GUI seen by clients, using server-side Python
- Add conditions and loops in templates to avoid repetitions, build common layouts

Databases and Model layer

- Learn about connecting to a relational database in Django.
- Learn about Django migrations, and how to use them to update your database schema.
- Explore Django ORM (Object Relational Mapping). Understand Django models, relationship between models, learn how to query on models.

Django Forms

- Understand the Django approach of building, handling, validating and submitting HTML forms.