



## CORE PYTHON

### Python Overview

- What is Python?
- The Birth of Python
- Python Timeline
- Features of Python
- Versions of Python

### The Python Environment

- Installation of Python
- Python Documentation
- Getting Help
- Python Editors and IDEs
- Basic Syntax
- Running a Python Script
- Python Scripts on UNIX/Windows

### Getting Started

- Keywords
- Data Types
- Variables
- Naming Conventions
- Print(),Type(),Id() Functions
- Input(), Raw\_input() functions
- Conversion functions
- Del Keyword

### String Handling

- What is String?
- Single-quoted string literals
- Tripe-quoted string literals
- String Indexing
- String Slicing
- Working with String Functions
- Working with String Methods

### Operators

- Arithmetic Operators
- Relational Operators
- Logical Operators

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- Assignment Operators
- Short Hand Assignment Operators
- Bitwise Operators
- Membership Operators
- Identity Operators

### Flow Control

- About Flow Control
- Conditional Statements (Simple if, if...else, if...elif...)
- Looping Statements ( while loop, while ... else, for loop, infinite loop, nested loops)
- Break
- Continue
- Pass

### Sequences

- About Sequences
- Lists
- Multi-Dimensional Arrays
- Tuples
- Indexing and Slicing
- Iterating through a sequence
- Functions for all sequences
- Operators and keywords for sequences
- The xrange() function
- Nest sequences
- List comprehensions
- Generator expressions
- Yield vs return
- Iterators and Generators

### Dictionaries and Sets

- About Dictionaries
- When to use dictionaries
- Creating Dictionaries
- Getting dictionary values
- Iterating through a dictionary
- Reading file data into a dictionary
- Counting with dictionaries
- About sets
- Creating sets

- Working with sets

## Functions

- Defining a function
- Calling a function
- Function Parameters
- Returning Values
- Variables scope
- Call by value
- Call by reference
- Passing collections to a function
- Passing functions to function
- Lamda function

## Modules

- What is a module?
- Creating user defined module
- Setting path
- The import statement
- Module search path
- From ... Import
- Module Aliases
- Dir function
- Working with Standard modules ( Math, Random, Date and time, Os and sys, String,...)

## Packages

- Introduction to Packages
- Executing Modules as Scripts
- Packages in Multiple Directories
- Fancier Output Formatting
- Compiled Python Files
- Types of Compiled Python Files
- Compatibility of Compiled Python Files

## Errors and Exception Handling

- Syntax Errors
- What is Exception?
- Need of Exception handling
- Predefined Exceptions
- Predefined Exceptions Hierarchy

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- Except, try, finally clause
- Handling Multiple Exceptions
- User defined Exceptions
- Raise, assert statements

## File Handling

- Opening a file
- Closing a file
- Writing data to files
- Reading a data from files
- Tell(),Seek() functions
- Working with Directories

## ADVANCED PYTHON

### OOPs concepts

- About OO programming
- Defining Classes
- Creating object
- Class methods and data
- Static methods
- Private methods
- Constructors
- Destructors
- Inheritance
- Types of inheritances
- Polymorphism (over loading & over riding)
- Data hiding

### Regular Expressions

- What is regular expression?
- Wild card characters
- Forming regular expressions
- Character classes
- Quantifiers
- Greedy matches
- Grouping
- Match, Serach functions
- Matching vs searching
- Sub function
- Splitting a string
- Replacing text

- Flags

## Multi Threading

- Defining a thread
- Starting a thread
- Threading module
- Threads synchronization
- Multithreaded priority queue

## Database access

- Basics of database
- Connections
- Executing queries
- Transaction management

## Advanced modules (Just an overview)

- Maths and sciences (Numpy, scipy, matplotlib)
- Data analysis (pandas)
- Network Programming (Socket module, Twisted module, Client and server)
- Testing (Unit test)
- Web (Beautiful soup, Python web, Mechanize)
- Gui programming (tkinter programming, pyGtk, PyQt)
- Gaming (pygame-2d animation, piglet-3d animation)
- Excel (Openpyxl, Xlrd, Xlwt)
- Images (PIL, Videocapture)

## Django at a glance

- Designing a model
- Django philosophies
- MVC Pattern
- Install model
- A dynamic admin interface
- Design your URLs
- Write your views

# Python with Django

- Design your templates

-----above part is mostly theoretical (Django at a glance section)-----  
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## Quick install guide

- Install Python
- Set up a database
- Remove any old versions of Django
- Install Django

## Writing your first Django app

- Creating a project
- The development server
- Database setup
- Creating models
- Activating models
- Introducing the Django Admin
- Raising a 404 error
- Use the template system
- Removing hardcoded URLs in templates
- Namespacing URL names

## Dealing with databases

- Making queries
- Aggregation
- Search
- Managers
- Performing raw SQL queries
- Database transactions
- Multiple databases
- Tablespace

- Database access optimization
- Database instrumentation
- Examples of model relationship API usage

#### Handling HTTP requests

- URL dispatcher
- Writing views
- View decorators
- File Uploads
- Django shortcut functions
- Generic views
- Middleware
- How to use sessions

#### Working with forms

- HTML forms
- Django's role in forms
- Forms in Django
- Building a form
- More about Django Form classes
- Working with form templates
- Further topics

#### Templates

- Support for template engines
- The Django template language

#### Class-based views

- Introduction to class-based views
- Built-in class-based generic views

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- Form handling with class-based views
- Using mixins with class-based views
- Basic examples
- Simple usage in your URLconf
- Subclassing generic views

#### Migrations

- The Commands
- Workflow
- Dependencies
- Migration files
- Adding migrations to apps
- Historical models
- Considerations when removing model fields
- Data Migrations
- Squashing migrations
- Serializing values
- Supporting multiple Django versions

#### Testing in Django

- Writing and running tests
- Testing tools

#### Django's cache framework

- Setting up the cache
- The per-site cache
- The per-view cache
- Template fragment caching
- The low-level cache API
- Downstream caches

- Using Vary headers
- Controlling cache: Using other headers

### Conditional View Processing

- The condition decorator
- Shortcuts for only computing one value
- Using the decorators with other HTTP methods
- Comparison with middleware conditional processing

### Cryptographic signing

- Protecting the SECRET\_KEY
- Using the low-level API

### Sending email

- Quick example
- send\_mail()
- send\_mass\_mail()
- mail\_admins()
- mail\_managers()
- Examples
- Preventing header injection
- The EmailMessage class
- Email backends
- Configuring email for development

### Logging

- A quick logging primer
- Using logging
- Configuring logging

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- Django's logging extensions
- Django's default logging configuration

### Pagination

- Example
- Using Paginator in a view
- Paginator objects
- InvalidPage exceptions
- Page objects

### Security in Django

- Cross site scripting (XSS) protection
- Cross site request forgery (CSRF) protection
- SQL injection protection
- Clickjacking protection
- SSL/HTTPS
- Host header validation
- Session security
- User-uploaded content
- Additional security topics