

# INDEX

1. **Language Fundamentals 1**
2. **Operators 32**
3. **Flow Control 56**
4. **String Data Type 72**
5. **List Data Structure 98**
6. **Tuple Data Structure 116**
7. **Set Data Structure 124**
8. **Dictionary Data Structure 131**
9. **Functions 142**
10. **Modules 162**
11. **Packages 173**
12. **100 Pattern Programs 177**



# DETAILED INDEX

1. LANGUAGE FUNDAMENTALS 1
   * **Introduction 2**
   * **Features of Python 4**
2. **Simple and Easy to Learn**
3. **Freeware and Open Source**
4. **High Level Programming Language**
5. **Platform Independent**
6. **Portability**
7. **Dynamically Typed**
8. **Both Procedure Oriented and Object Oriented**
9. **Interpreted**
10. **Extensible**
11. **Embedded**
12. **Extensive Library**
    * **Limitations of Python 5**
    * **Flavors of Python 6**
13. **CPython**
14. **Jython OR JPython**
15. **IronPython**
16. **PyPy**
17. **RubyPython**
18. **AnacondaPython**
    * **Python Versions 6**
    * **Identifiers 7**
    * **Reserved Words 9**



* + **DATA TYPES 10**

1. **int Data Type**
   * **Decimal Form**
   * **Binary Form**
   * **Octal Form**
   * **Hexa Decimal Form**
2. **Float Data Type**
3. **Complex Data Type**
4. **bool Data Type**
5. **str Data Type**
6. **bytes Data Type**
7. **bytearray Data Type**
8. **List Data Type**
9. **Tuple Data Type**
10. **Range Data Type**
11. **Set Data Type**
12. **frozenset Data Type**
13. **dict Data Type**
14. **None Data Type**
    * **Base Conversions 12**
    * **Slicing of Strings 16**
    * **TYPE CASTING 18**
      + **int()**
      + **float()**
      + **complex()**
      + **bool()**
      + **str()**
    * **Fundamental Data Types vs Immutability 21**
    * **Escape Characters 31**
    * **Constants 31**
15. OPERATORS 32
    1. **Arithmetic Operators 33**
    2. **Relational Operators OR Comparison Operators 35**
    3. **Equality Operators 36**



* 1. **Logical Operators 37**
  2. **Bitwise Oeprators 38**
     + **Bitwise Complement Operator (~)**
  3. **Shift Operators 39**
     + **<< Left Shift Operator**
     + **>> Right Shift Operator**
  4. **Assignment operators 40**
  5. **Ternary Operator OR Conditional Operator 41**
  6. **Special operators 42**
     + **Identity Operators**
     + **Membership operators**

֍ Operator Precedence 44

֍ Mathematical Functions (math Module) 45

֍ Command Line Arguments 50

֍ Output Statements 52

1. FLOW CONTROL 56

֍ Conditional Statements 57

* **if**
* **if-elif**
* **if-elif-else**

֍ Iterative Statements 62

* **for**
* **while**

֍ Transfer Statements 66

* **break**
* **continue**
* **pass**

֍ Loops with else Block 68

֍ del Statement 70



֍ Difference between del and None 71

1. STRING DATA TYPE 72

⚽ What is String? 73

⚽ How to define multi-line String Literals? 73

⚽ How to Access Characters of a String? 74

* **Accessing Characters By using Index**
* **Accessing Characters by using Slice Operator**

⚽ Behaviour of Slice Operator 75

⚽ Slice Operator Case Study 76

⚽ Mathematical Operators for String 76

⚽ len() in-built Function 77

⚽ Checking Membership 78

⚽ Comparison of Strings 78

⚽ Removing Spaces from the String 79

* + **rstrip()**
  + **lstrip()**
  + **strip()**

⚽ Finding Substrings 79

⚽ Counting substring in the given String 81

⚽ Replacing a String with another String 82

⚽ Splitting of Strings 83

⚽ Joining of Strings 83

⚽ Changing Case of a String 84

⚽ Checking Starting and Ending Part of the String 84

* **s.startswith(substring)**
* **s.endswith(substring)**

⚽ To Check Type of Characters Present in a String 85

⚽ Formatting the Strings 86



⚽ Important Programs regarding String Concept 87

* 1. **Program to Reverse the given String**
  2. **Program to Reverse Order of Words**
  3. **Program to Reverse Internal Content of each Word**
  4. **Program to Print Characters at Odd Position and Even Position for the given String**
  5. **Program to Merge Characters of 2 Strings into a Single String by taking Characters alternatively**
  6. **Program to Sort the Characters of the String and First Alphabet Symbols followed by Numeric Values**
  7. **Program for the following Requirement (Input: a4b3c2, Output: aaaabbbcc)**
  8. **Program to perform the following Activity (Input: a4k3b2, Outpt: aeknbd)**
  9. **Program to Remove Duplicate Characters from the given Input String**
  10. **Program to find the Number of Occurrences of each Character present in the given String**
  11. **Program to perform the following Task**
      + **Input: 'one two three four five six seven'**
      + **Output: 'one owt three ruof five xis seven'**

⚽ Formatting the Strings 92

1. LIST DATA STRUCTURE 98

⚽ Creation of List Objects 99

⚽ Accessing Elements of List 100

* **By using Index**
* **By using Slice Operator**

⚽ List vs Mutability 102

⚽ Traversing the Elements of List 102

* **By using while Loop**
* **By using for Loop**
* **To display only Even Numbers**
* **To display Elements by Index wise**



⚽ Important Functions of List 104

☕ To get Information about List

* + **len()**
  + **count()**
  + **index()**

☕ Manipulating Elements of List

* + **append()**
  + **insert()**
  + **extend()**
  + **remove()**
  + **pop()**

☕ Ordering Elements of List

* + **reverse()**
  + **sort()**

⚽ Using Mathematical Operators for List Objects 111

* **Concatenation Operator (+)**
* **Repetition Operator (\*)**

⚽ Comparing List Objects 111

⚽ Membership Operators 112

* **in Operator**
* **not in Operator**

⚽ clear() Function 112

⚽ Nested Lists 113

⚽ Nested List as Matrix 113

⚽ List Comprehensions 114



1. TUPLE DATA STRUCTURE 116

⚽ Tuple Creation 118

⚽ Accessing Elements of Tuple

* **By using Index**
* **By using Slice Operator**

⚽ Tuple vs Immutability 119

⚽ Mathematical Operators for Tuple 119

* **Concatenation Operator (+)**
* **Multiplication Operator OR Repetition Operator (\*)**

⚽ Important Functions of Tuple 120

* **len()**
* **count()**
* **index()**
* **sorted()**
* **min() And max()**
* **cmp()**

⚽ Tuple Packing and Unpacking 121

⚽ Tuple Comprehension 122

⚽ Differences between List and Tuple 123

1. SET DATA STRUCTURE 124

⚽ Creation of Set Objects 125

⚽ Important Functions of Set 126

* **add(x)**
* **update(x,y,z)**
* **copy()**
* **pop()**
* **remove(x)**
* **discard(x)**
* **clear()**



⚽ Mathematical Operations on the Set 128

* **union()**
* **intersection()**
* **difference()**
* **symmetric\_difference()**

⚽ Membership Operators: (in, not in) 129

⚽ Set Comprehension 129

1. DICTIONARY DATA STRUCTURE 131

⚽ How to Create Dictionary? 132

⚽ How to Access Data from the Dictionary? 132

⚽ How to Update Dictionaries? 134

⚽ How to Delete Elements from Dictionary? 134

* **del d[key]**
* **d.clear()**
* **del d**

⚽ Important Functions of Dictionary 135

* **dict()**
* **len()**
* **clear()**
* **get()**
* **pop()**
* **popitem()**
* **keys()**
* **values()**
* **items()**
* **copy()**
* **setdefault()**
* **update()**

⚽ Dictionary Comprehension 141



1. FUNCTIONS 142

⚽ Built in Functions 143

⚽ User Defined Functions 143

⚽ Parameters 144

⚽ Return Statement 144

⚽ Returning Multiple Values from a Function 146

⚽ Types of Arguments 147

* **Positional Arguments**
* **Keyword Arguments**
* **Default Arguments**
* **Variable Length Arguments**

⚽ Case Study 151

⚽ Types of Variables 152

* **Global Variables**
* **Local Variables**

⚽ global Keyword 153

⚽ Recursive Functions 154

⚽ Anonymous Functions 155

⚽ Normal Function 155

⚽ Lambda Function 155

⚽ filter() Function 156

⚽ map() Function 156

⚽ reduce() Function 158

⚽ Everything is an Object 159

⚽ Function Aliasing 159

⚽ Nested Functions 160



1. MODULES 162

⚽ Renaming a Module at the time of import (Module Aliasing) 164

⚽ from ... import 164

⚽ Various Possibilties of import 164

⚽ Member Aliasing 165

⚽ Reloading a Module 165

⚽ Finding Members of Module by using dir() Function 166

⚽ The Special Variable name 168

⚽ Working with math Module 169

⚽ Working with random Module 169

* **random() Function**
* **randint() Function**
* **uniform() Function**
* **randrange ([start], stop, [step])**
* **choice() Function**

1. PACKAGES 173
2. 100 PATTERN PROGRAMS 177