**Data Structures**

**CHEAT SHEET**

**Python - Data Structure**

### Data Types

- **Integer**: used to represent numeric data, more specifically whole numbers from negative infinity to infinity. 
  
  - Union: All numbers from negative infinity to infinity.
  
  - Example: int

- **Float**: floats for floating point numbers.
  
  - Example: float

- **String**: A collection of Alphabets, words or other characters.
  
  - Example: string

- **List**: Ordered sequence of values indexed by integer numbers. Lists are mutable.
  
  - Syntax: list

- **Tuple**: Tuples are immutable. They can be used in sets.
  
  - Syntax: tuple

- **Dictionary**: It is a container of objects that can be inserted or removed according to LIFO (Last In First Out) concept. Pop method is used during disposal in Python.
  
  - Syntax: dict

### Types of Data Structures

**Non-Primitive Data Structures:**

- **Array**: It is a compact way of collecting data types where all elements must be of the same data type.
  
  - Syntax of writing an array in Python: import array as arr

- **List**: List can be used to store collection of heterogeneous items. It is described using the square brackets [] and hold elements separated by comma.
  
  - Syntax: [element1, element2, ...]

- **Tuple**: Tuples are immutable! They can be used in sets.
  
  - Syntax: (element1, element2, ...)

- **Dictionary**: It is an unordered set of key value pairs. It supports mathematical operations like union, intersection, difference and symmetric difference.
  
  - Syntax: {key: value}

**Primitive Data Structures:**

- **Integer**: used to represent numeric data, more specifically whole numbers from negative infinity to infinity. 

- **Float**: floats for floating point numbers.

- **String**: A collection of Alphabets, words or other characters.

- **List**: Ordered sequence of values indexed by integer numbers. Lists are mutable.

- **Tuple**: Tuples are immutable! They can be used in sets.

- **Dictionary**: It is an unordered set of key value pairs. It supports mathematical operations like union, intersection, difference and symmetric difference.

### Sets

- **Union of two sets**: 
  
  - Syntax: mySet1 | mySet2

- **Intersection of two sets**: 
  
  - Syntax: mySet1 & mySet2

- **Difference of two sets**: 
  
  - Syntax: mySet1 - mySet2

- **Symmetric difference of two sets**: 
  
  - Syntax: mySet1 ^ mySet2

### Dictionaries

- **Length of the dictionary**: 
  
  - Syntax: len(myDict)

### Algorithms

- **Selection sort**: 
  
  - Syntax: X = n^2

- **Insertion sort**: 
  
  - Syntax: n^2

- **Bubble sort**: 
  
  - Syntax: n

- **Shell sort**: 
  
  - Syntax: n log n

- **Merge sort**: 
  
  - Syntax: n log n

- **Quick sort**: 
  
  - Syntax: n log n

### Data Structures

**Dictionary**

- **Insert**
  
  - Syntax: myDict["key"] = newValue

- **Remove**
  
  - Syntax: del myDict["key"]

**List**

- **Append**
  
  - Syntax: myList.append("value")

- **Pop**
  
  - Syntax: myList.pop()