Topic	Briefing of the topic	Items covered
1. Variables, Data Types and Operators	**a)** Variables are containers for storing data values. **b)** Python has 5 standard data types (Numbers, Strings, List, Tuple, and Dictionary). **c)** Python has various operators (Arithmetic, Relational, Logical etc.)	**i)** Variable naming conventions ✓ **Do not use built-in functions name** ✓ **Start with a small alphabet letter** ✓ **Do not use special characters except underscore** **ii)** Data type and data type functions **iii)** Operators **(+, -, *, %, **, %, /, //)** **iv)** Learn about input function, type conversion and comments
2. Branching	**a)** Replaces different parts program with variables, loops and if, elif, else commands over the code.	**i)** Single branch (b) **ii)** Nested branch (b) **iv) if(only one/b), elif(0 to infinity/b), else(0 or 1/b)**
3. Iteration	**a)** We generally use iteration in loops. **b)** Break and continue it a part of iteration. It commands either to stop the loop or to process again following the conditions	***Loop/Repetitive Task(Block of Code):*** **i)** While Loop ▪ Known Logic: **(while s<10)** ▪ Unknown Logic: **(while True)** **ii)** For Loop **(Index or collection of item wise iteration)** **iii)** Keywords: **break, continue** **iv)** Nested while and for Loop ***Loop1:*** ***Loop2:***
4. Data Structure(String, List)	❖ ***String:*** **a)** We can iterate string, **b)** Strings are immutable ❖ ***List:*** **a)** A list are surrounded with brackets [] **b)** Lists are mutable in nature	***String:*** **i)** String indexing/slicing **ii)**String functions (len(),split()) **iii)** Character to ASCII (ord()) **iv)** String immutability ***List:*** **i)** List concatenation **([1,2]+[3]=[1,2,3])** **ii)** List functions: **(append(),sort(),index(),count())**
5. Data Structures(Tuple, Dictionary, and comparison)	❖ ***Dictionary:*** **a)** A dictionary is created inside curly braces {} and separated by commas **b)** Dictionary holds a pair of values in the format of Key: value. **c)** Values in a dictionary can be of any data-type and can be duplicated, whereas keys can't be repeated and must be immutable. ❖ ***Tuple:*** **a)** Items are surrounded with parenthesis () **b)** Tuples are immutable in nature	***Dictionary :*** **i)** Dictionary creating **({key:value})** **ii)** Accessing dictionary value **(dict_name[key])** **iii)** Dictionary mutability **iv)**Adding/updating/deleting **v)** Iterating over a dictionary **vi)** Built-in function of dictionary **(items(), keys(),values())** ***Tuples:*** **i)** Creating tuple **(Null: (), Single : (i_1,), Multiple: (i_1,i_2, ...,i_n))** **ii)** Accessing tuple elements **iii)** Tuples immutability **iv)** Iterating over tuples
6. Functions and Variables	**a)** Function is a set of block instructions.	**i)** Arguments **(number of arguments, unknown number of arguments)** **ii)** Fixed keyword arguments, Optional keyword arguments **iii)** Default value arguments **def function(name=None):** **pass** **iv)** Tuple argument or asterisk variable argument
7. Sorting and searching	**a)** Sorting is any process of arranging items systematically. **b)** Easy sorting can be done in python using the built-in sort() function. using loops and different algorithms we can sort a function in python	**i)** Built-in sort function **(In place change of the list itself)** **ii)** Selection sort **iii)** Bubble sort **iv)** Searching **(Finding a key/item from a collection of items and return the index. For failure in finding the key return -1)**

Md. Saiful Islam (M S I)