Data Structures and Algorithms Assignment 7

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LIST : A list in Python is a collection of items which can contain elements of multiple data types, which may be either numeric, character logical values, etc. It is an ordered collection supporting negative indexing. A list can be created using [] containing data values. Contents of lists can be easily merged and copied using python's inbuilt functions.

```
# creating a list containing elements
# belonging to different data types
sample_list = [1,"Benayaram",['a','e']]
print(sample_list)
```

Output :

```
[1, 'Benayaram', ['a', 'e']]
```

The first element is an integer, the second a string and the third is an list of characters.

Array : An array is a vector containing homogeneous elements i.e. belonging to the same data type. Elements are allocated with contiguous memory locations allowing easy modification, that is, addition, deletion, accessing of elements. In Python, we have to use the array module to declare arrays. If the elements of an array belong to different data types, an exception "Incompatible data types" is thrown.

```
# creating an array containing same
# data type elements
import array
```

```
sample_array = array.array('i', [1, 2, 3])

# accessing elements of array
for i in sample_array:
    print(i)
```

Output :

```
1

2

3
```

List	Array
Can consist of elements belonging to different data types	Only consists of elements belonging to the same data type
No need to explicitly import a module for declaration	Need to explicitly import a module for declaration
Cannot directly handle arithmetic operations	Can directly handle arithmetic operations
Can be nested to contain different type of elements	Must contain either all nested elements of same size
Preferred for shorter sequence of data items	Preferred for longer sequence of data items
Greater flexibility allows easy modification (addition, deletion) of data	Less flexibility since addition, deletion has to be done element wise
Consume larger memory for easy addition of elements	Comparatively more compact in memory size