SNS COLLEGE OF ENGINEERING

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Department of Artificial Intelligence and Data Science

Course Name – Computational Thinking and Python Programming

I Year / I Semester

Unit 3-CONTROL FLOW, FUNCTIONS

List as array:
Array:

Array is a collection of similar elements. Elements in the array can be accessed by index. Index starts with 0. Array can be handled in python by module named array. To create array have to import array module in the program.

Syntax :
import array

Syntax to create array:
Array_name = module_name.function_name(‘datatype’,[elements])

example:
a=array.array(‘i’,[1,2,3,4])
a- array name
array- module name
i- integer datatype

Example
Program to find sum of array elements

```
import array
sum=0
a=array.array('i',[1,2,3,4])
for i in a:
sum=sum+i
print(sum)
```

Output
10

1. single quotes (' ')
2. double quotes (" ")
3. triple quotes(“”” “”””)

Operations on string:

1. Indexing
2. Slicing
3. Concatenation
4. Repetitions
5. Member ship

String A	H	E	L	L	O
Positive Index	0	1	2	3	4
Negative Index	-5	-4	-3	-2	-1

indexing	>>>a=”HELLO” >>>print(a[0]) >>>H >>>print(a[-1]) >>>O	❖ Positive indexing helps in accessing the string from the beginning ❖ Negative subscript helps in accessing the string from the end.
Slicing:	Print[0:4] – HELL Print[:3] – HEL Print[0:]- HELLO	The Slice[start : stop] operator extracts sub string from the strings. A segment of a string is called a slice.
Concatenation	a=”save” b=”earth” >>>print(a+b) saveearth	The + operator joins the text on both sides of the operator.
Repetitions:	a=”panimalar ” >>>print(3*a) panimalarpanimalar panimalar	The * operator repeats the string on the left hand side times the value on right hand side.

Membership:	>>> s="good morning"
	>>>"m" in s
	True
	>>> "a" not in s
	True
		Using membership operators to check a particular character is in string or not. Returns true if present

Convert list into array:

fromlist() function is used to append list to array. Here the list is act like a array.

Syntax:
arrayname.fromlist(list_name)

Example

program to convert list into array

```
import array
sum=0
l=[6,7,8,9,5]
a=array.array('i',[])
a.fromlist(l)
for i in a:
        sum=sum+i
print(sum)
```

Output
35

Methods in array
a=[2,3,4,5]

	Syntax	example	Description
1	array(data type, value list)	array('i',[2,3,4,5])	This function is used to create an array with data type and value list specified in its arguments.
2	append()	>>>a.append(6) [2,3,4,5,6]	This method is used to add the at the end of the array.
3	insert(index,element)	>>>a.insert(2,10) [2,3,10,5,6]	This method is used to add the value at the position specified in its argument.
4	pop(index)	>>>a.pop(1) [2,10,5,6]	This function removes the element at the position mentioned in its argument, and returns it.
5	index(element)	>>>a.index(2) 0	This function returns the index of value
6	reverse()	>>>a.reverse() [6,5,10,2]	This function reverses the array.
7	count()	a.count() 4	This is used to count number of elements in an array

Function Composition :

Function Composition is the ability to call one function from within another function
It is a way of combining functions such that the result of each function is passed as the argument of the next function.
In other words the output of one function is given as the input of another function is known as function composition.

find sum and average using function composition	**output**

def sum(a,b):
  sum=a+b
  return sum
def avg(sum):
  avg=sum/2
  return avg
a=eval(input("enter a:"))
b=eval(input("enter b:"))
sum=sum(a,b)
avg=avg(sum)
print("the avg is",avg)
	enter a:4 enter
	b:8
	the avg is 6.0

Recursion

A function calling itself till it reaches the base value - stop point of function call. Example: factorial of a given number using recursion

Factorial of n	**Output**

def fact(n):
  if(n==1):
  return 1
  else:
  return n*fact(n-1)
n=eval(input("enter no. to find fact:"))
fact=fact(n)
print("Fact is",fact)
	enter no. to find fact:5
	Fact is 120