Pattern: Assignment

Due on Monday, February 4, 2019

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Question 1

Python List and Its related functions

List is a collection datatype in python which is ordered and changeable.It allows duplicate members. Example : thislist = ["apple", "banana", "cherry"] . Lists can hold all types of data even list of lists is possible. Some Popular functions used with python lists are "append" , "extend" ,"pop","del",etc. Examples are given below

(a) *List append: Adds an element at the end of the list.*

```
list = [1, 3, 5]
odd.append(7)
```

Here "7" will be added at the end of thislist.Output will be something like this
list=[1, 3, 5,7]

(b) *List extend: add the elements of a list , to the end of the current list..*

list = [1, 3, 5] list.extend([9, 11, 13]) Here the output will be list=[1, 3, 5, 7, 9, 11, 13].

Question 2

Enumerate function

Enumerate() method adds a counter to an iterable and returns it in a form of enumerate object. This enumerate object can then be used directly in for loops or be converted into a list of tuples using list() method enumerate(iterable, start=0)
Example:

```
list1 = ["eat","sleep","repeat"]
print list(enumerate(l1))
output: [(0, ’eat’), (1, ’sleep’), (2, ’repeat’)]
```

Question 3

Python Zip

The zip() function take iterables (can be zero or more), makes iterator that aggregates elements based on the iterables passed, and returns an iterator of tuples.
Example:

```
numberList = [1, 2, 3]
strList = [’one’, ’two’, ’three’]
result = zip()
resultList = list(result)
print(resultList)
```

Question 3 continued on next page. . .

```
result = zip(numberList, strList)
resultSet = set(result)
print(resultSet)
output : []
(2, ’two’), (3, ’three’), (1, ’one’)]
```

Question 4

Lamda expression

A lambda function is a small anonymous function.A lambda function can take any number of arguments, but can only have one expression.**the power of lambda is better shown when you use them as an anonymous function inside another function.Syntax:-lambda arguments: expression**The expression is evaluated and returned. Lambda functions can be used wherever function objects are required.

Example:

```
x = lambda a : a + 10
print(x(5))
Output: 15
```

Question 5

Slicing in python

We can also call out a range of characters from the string. Say we would like to just print the word Shark. We can do so by creating a slice, which is a sequence of characters within an original string. With slices, we can call multiple character values by creating a range of index numbers separated by a colon string[x:y].Slicing can not only be used for lists, tuples or arrays, but custom data structures as well, with the slice object.**Slicing arguments: [start:end:step], [row:column], [start:end,start:end]**

Question 6

Numpy Library

The numpy package (module) is used in almost all numerical computation using Python. It is a package that provide highperformance vector, matrix and higher-dimensional data structures for Python. It is implemented in C and Fortran so when calculations are vectorized (formulated with vectors and matrices), performance is very good.

To use numpy first import the module:

»> import numpy as np

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Question 7

How to index in python?

There are 2 types of indexing.
1.Pure integer indexing
2.Boolean indexing

(a) Pure integer indexing:

Integer array indexing allows selection of arbitrary items in the array based on their N-dimensional index. Each integer array represents a number of indexes into that dimension.When the index consists of as many integer arrays as the array being indexed has dimensions, the indexing is straight forward, but different from slicing.

Example:

```
»> x = np.array([[1, 2], [3, 4], [5, 6]])
»> x[[0, 1, 2], [0, 1, 0]]
array([1, 4, 5])
```

(b) Boolean indexing:

This advanced indexing occurs when obj is an array object of Boolean type, such as may be returned from comparison operators. A single boolean index array is practically identical to x[obj.nonzero()] where, as described above, obj.nonzero() returns a tuple (of length obj.ndim) of integer index arrays showing the True elements of obj. However, it is faster when obj.shape == x.shape.
If obj.ndim == x.ndim, x[obj] returns a 1-dimensional array filled with the elements of x corresponding to the True values of obj. The search order will be row-major, C-style. If obj has True values at entries that are outside of the bounds of x, then an index error will be raised. If obj is smaller than x it is identical to filling it with False

Question 8

Plot In python

matplotlib.pyplot is a collection of command style functions that make matplotlib work like MATLAB. Each pyplot function makes some change to a figure: e.g., creates a figure, creates a plotting area in a figure, plots some lines in a plotting area, decorates the plot with labels, etc.
Example:

```
import matplotlib.pyplot as plt
plt.plot([1,2,3,4])
plt.ylabel('some numbers')
plt.show()
```

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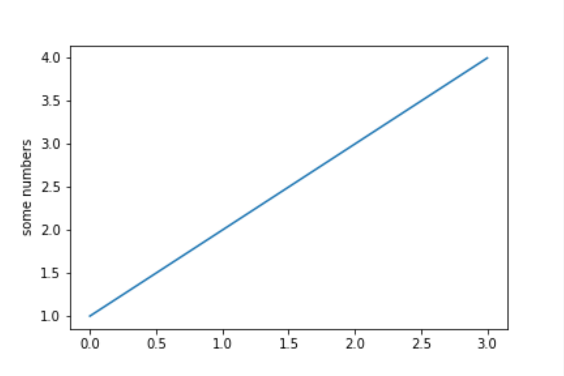
some numbers
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.0
0.5
1.0
1.5
2.0
2.5
3.0