Introduction to Python

CMP 201 (2019/2020)

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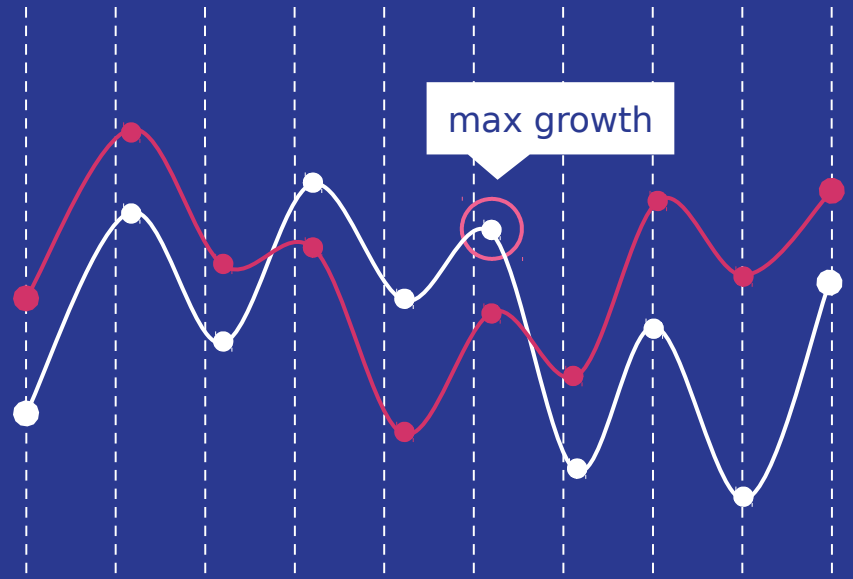


LESSON 5:
Be a Ninja Coder!

Objectives

The aim of this lesson is to introduce the **python programming language**.

Content(Week 1)

- **Lists**
- Tuples
- Sets
- Dictionary

Python Collections:

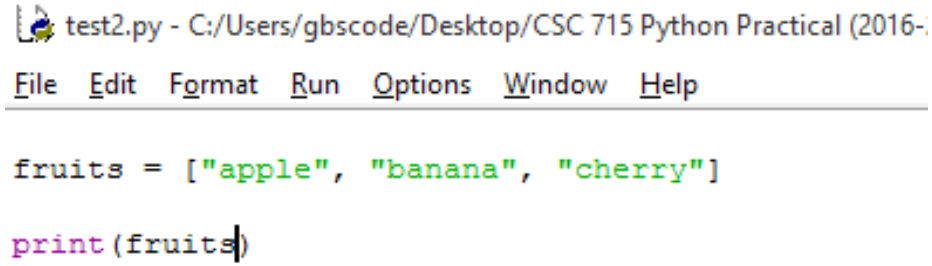
There are four collection data types in the Python programming language:

- **List** is a collection which is ordered and changeable. Allows duplicate members.
- **Tuple** is a collection which is ordered and unchangeable. Allows duplicate members.
- **Set** is a collection which is unordered and unindexed. No duplicate members.
- **Dictionary** is a collection which is unordered, changeable and indexed. No duplicate members.

Python Lists:

A list is a collection which is ordered and changeable. In Python lists are written with square brackets.

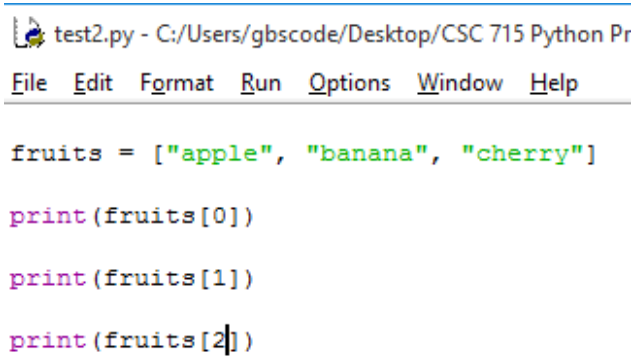
Create a List:



Access Lists items:

You access the list items by referring to the index number. The index number is zero based.

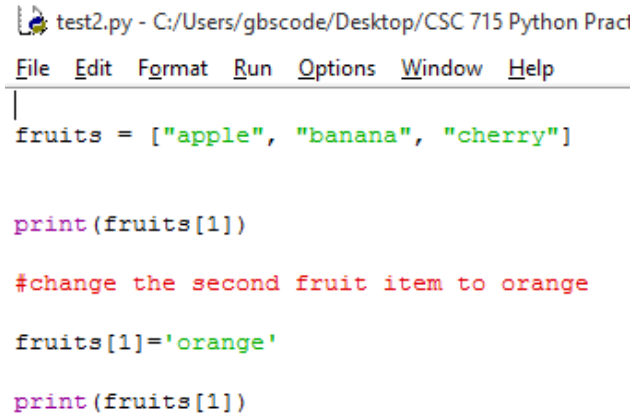
Access Items:



Change Lists items value:

To change the value of a specific item, refer to the index number:

Change List Items:



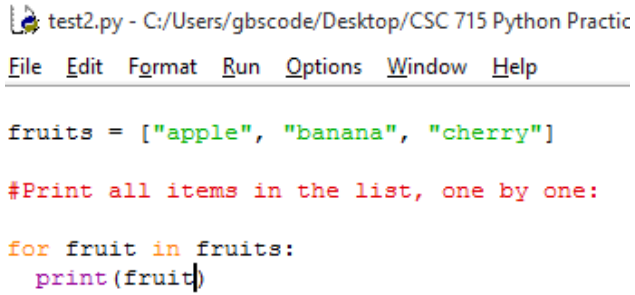
PUZZLE:

```
squares= [ 1, 4, 9, 16, 25 ]
print (squares[0])
```

Loop through a list:

You can loop through the list items by using a for loop:

Looping through the List Items:



Check if item exists:

To determine if a specified item is present in a list use the in keyword:

Checking if item exists in the list :

```
fruits = ["apple", "banana", "cherry"]

#Check if "apple" is present in the list:

if "apple" in fruits:
  print("Yes, 'apple' is in the fruits list")
```

List length:

To determine how many items a list has, use the len() method:

```
    fruits = ["apple", "banana", "cherry“]
x=len(fruits)
    print(x)
```

Add new items:

To add an item to the end of the list, use the append() method:

```
    fruits = [ "apple", "banana", "cherry“ ]
fruits.append(“mango“)
    fruits.append(“orange“)
    print(fruits)
```

Add new items:

To add an item at the specified index, use the insert() method:

```
    fruits = [ "apple", "banana", "cherry“ ]
fruits.insert(1, "orange")
    print(fruits)
```

PUZZLE:

```
cubes= [ 1, 8, 27 ]
cubes.append( 4**3 )
print ( cubes  )
```

Removing item from list:

There are several methods to remove items from a list:

The remove() method removes the specified item:

The pop() method removes the specified index, (or the last item if index is not specified):

The del keyword removes the specified index:

The clear() method empties the list:

Remove item: remove():

```
    fruits = ["apple", "banana", "cherry“]
fruits.remove("banana")
    print(fruits)
```

Remove item: pop():

```
    fruits = [ "apple", "banana", "cherry“ ]
fruits.pop()
    print(fruits)
    fruits.pop(0)
    print(fruits)
```

Remove item: del:

```
fruits = ["apple", "banana", "cherry“]
del fruits[0]
print(fruits)
```

Remove item: del:

The del keyword can also delete the list completely:

```
fruits = ["apple", "banana", "cherry“]
del fruits
```

Remove item: clear():

```
    fruits = ["apple", "banana", "cherry“]
fruits.clear()
    print(fruits)
```

List Methods:

Python has a set of built-in methods that you can use on lists.

Method	Description
append()	Adds an element at the end of the list
clear()	Removes all the elements from the list
copy()	Returns a copy of the list
count()	Returns the number of elements with the specified value
extend()	Add the elements of a list (or any iterable), to the end of the current list
index()	Returns the index of the first element with the specified value
insert()	Adds an element at the specified position
pop()	Removes the element at the specified position
remove()	Removes the item with the specified value
reverse()	Reverses the order of the list
sort()	Sorts the list

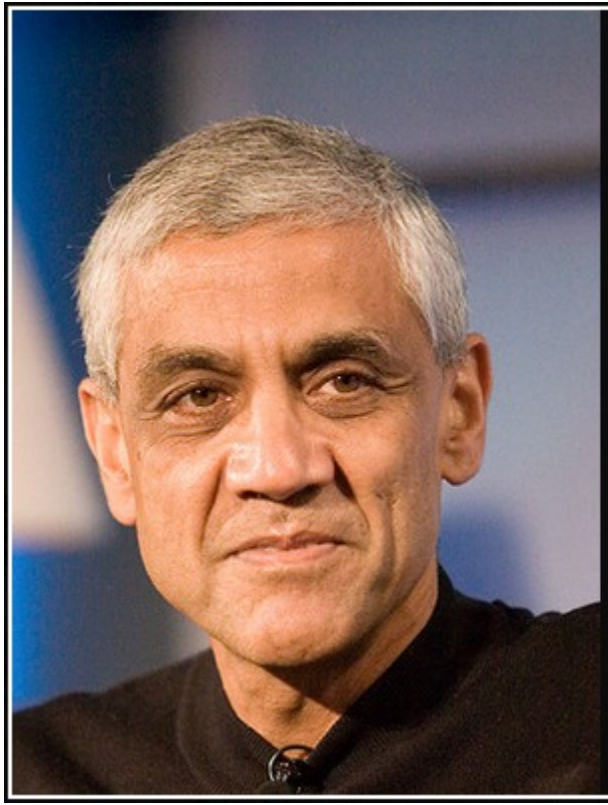
Task

To do in class

EXERCISE

(Uniqueness in code earns extra credit).

1. **Each question should be kept in a single .py file**
2. **then all zipped in a file**
3. **with your matric No. as name of the file**



Doctors can be replaced by software – 80% of them can. I'd much rather have a good machine learning system diagnose my disease than the median or average doctor.

— Vinod Khosla —

AZ QUOTES