SNS COLLEGE OF ENGINEERING
Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF COMPUTER SCIENCE AND DESIGN

19IT103 – COMPUTATIONAL THINKING AND PYTHON PROGRAMMING

- **A readable, dynamic, pleasant, flexible, fast and powerful language**

Recap

- Function composition is a way of combining functions
- Function composition is achieved through lambda functions
- Lambda functions are called anonymous because they are not declared in the standard manner by using the def keyword
- Recursion is the process calling a function by itself

Agenda

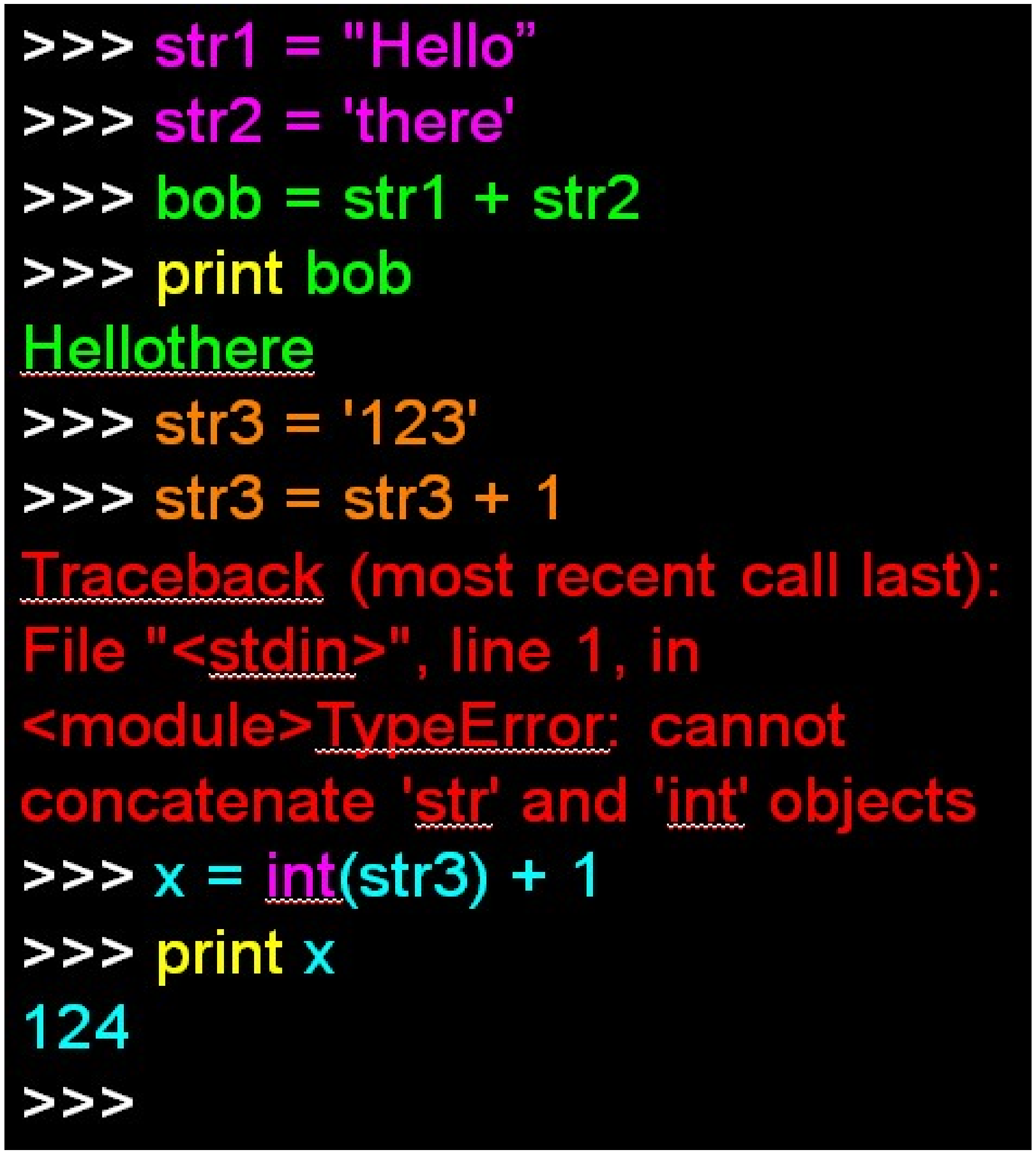
- Strings
- String Immutability

Strings

- A string is a sequence of characters
- A string literal uses quotes 'Hello' or "Hello"
- For strings, + means "concatenate"
- When a string contains numbers, it is still a string
- We can convert numbers in a string into a number using int()

Strings

Example:



```
>>> str1 = "Hello"
>>> str2 = 'there'
>>> bob = str1 + str2
>>> print bob
Hellothere
>>> str3 = '123'
>>> str3 = str3 + 1
Traceback (most recent call last):
File "<stdin>", line 1, in
<module>TypeError: cannot
concatenate 'str' and 'int' objects
>>> x = int(str3) + 1
>>> print x
124
>>>
```

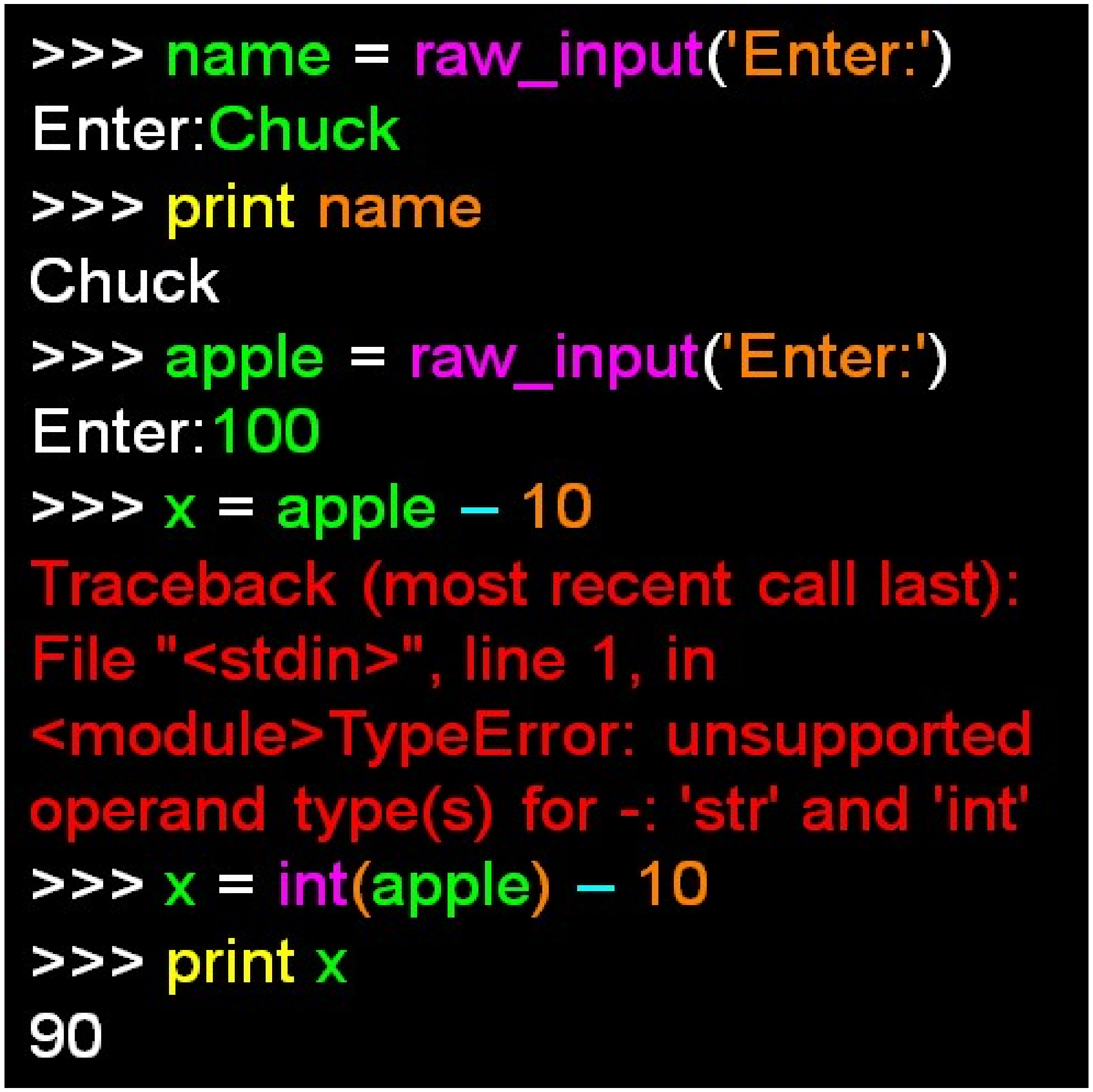
Strings

Reading and Converting

- We prefer to read data in using strings and then parse and convert the data as we need
- This gives us more control over error situations and/or bad user input
- Raw input numbers must be converted from strings

Strings

Example:

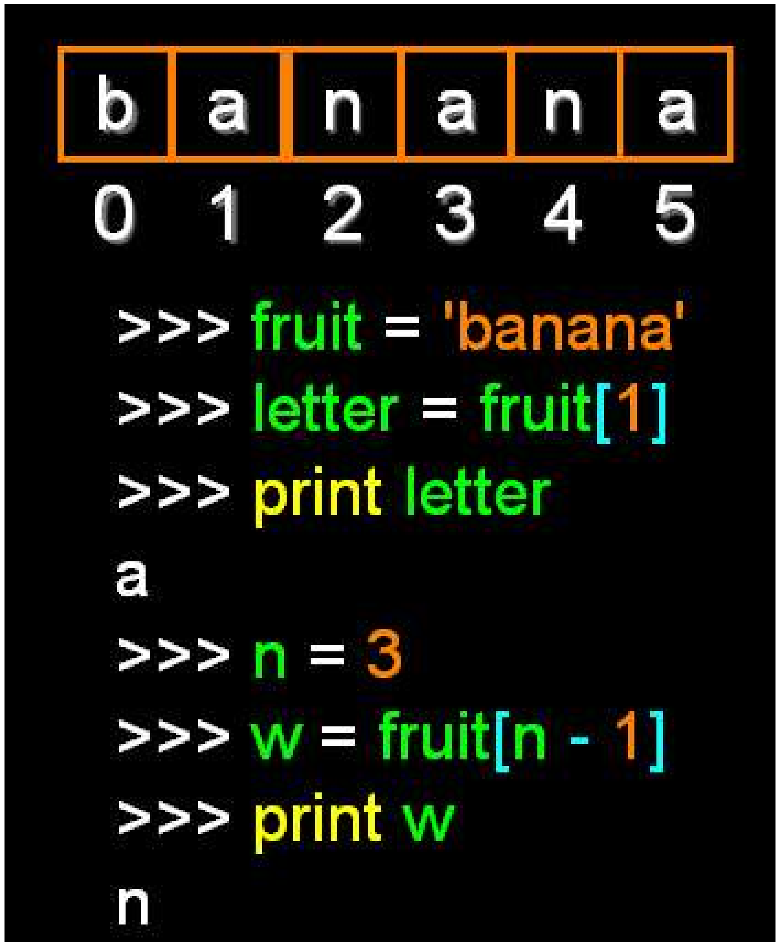


```
>>> name = raw_input('Enter:')
Enter:Chuck
>>> print name
Chuck
>>> apple = raw_input('Enter:')
Enter:100
>>> x = apple – 10
Traceback (most recent call last):
File "<stdin>", line 1, in
<module>TypeError: unsupported
operand type(s) for -: 'str' and 'int'
>>> x = int(apple) – 10
>>> print x
90
```

Strings

Looking Inside Strings:

- We can get at any single character in a string using an index specified in square brackets
- The index value must be an integer and starts at zero
- The index value can be an expression that is computed

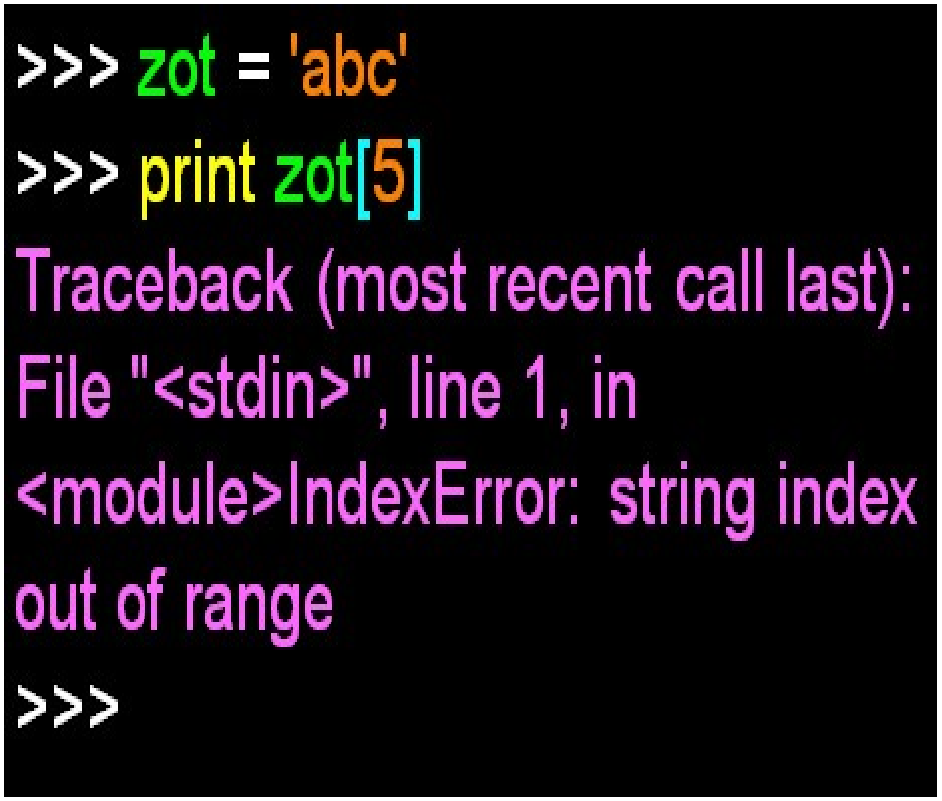


```
>>> fruit = 'banana'
>>> letter = fruit[1]
>>> print letter
a
>>> n = 3
>>> w = fruit[n - 1]
>>> print w
n
```

Strings

A Character Too Far

- You will get a python error if you attempt to index beyond the end of a string.
- So be careful when constructing index values and slices

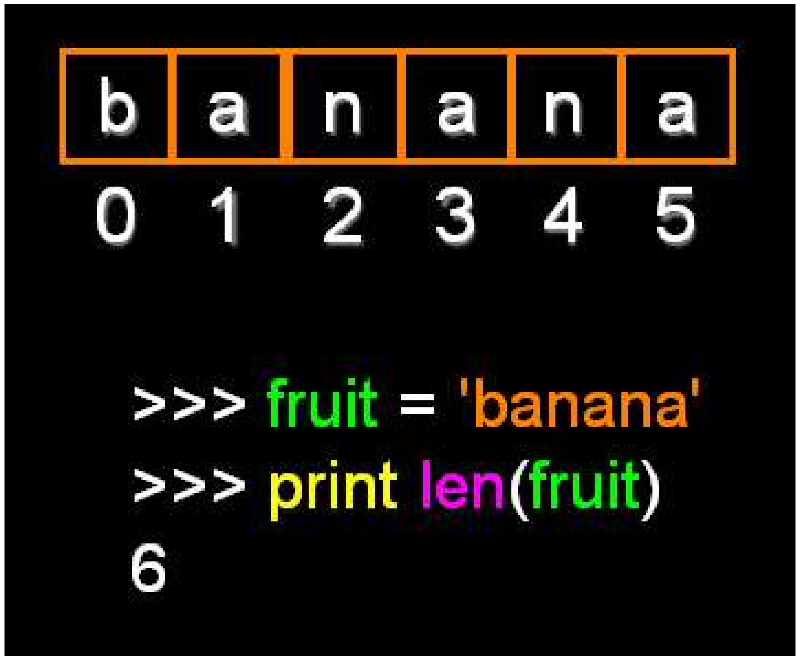


```
>>> zot = 'abc'
>>> print zot[5]
Traceback (most recent call last):
File "<stdin>", line 1, in
<module>IndexError: string index
out of range
>>>
```

Strings

Strings Have Length

- There is a built-in function len that gives us the length of a string

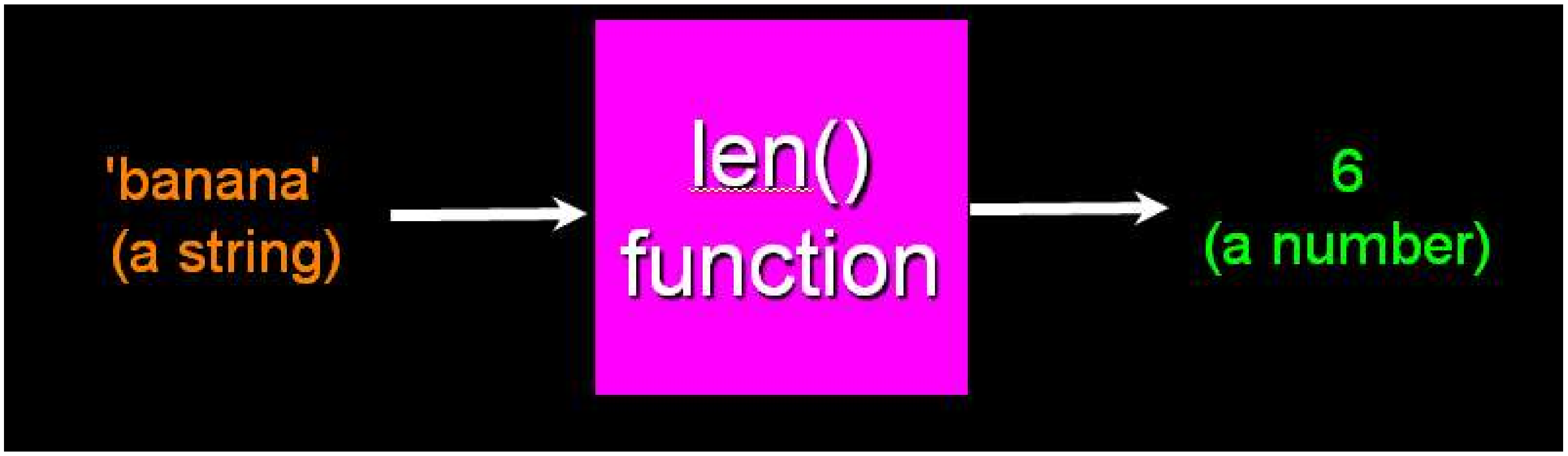


```
>>> fruit = 'banana'
>>> print len(fruit)
6
```

Strings

Len Function

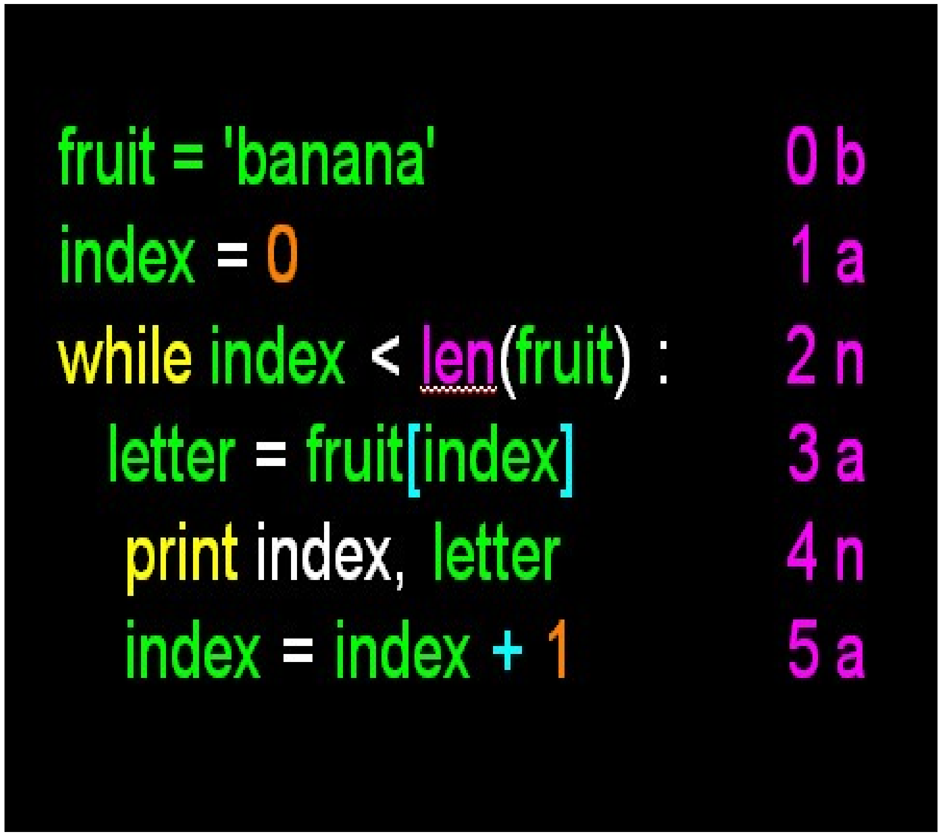
```
>>> fruit = 'banana'
>>> x = len(fruit)
>>> print x
6
```



Strings

Looping Through Strings:

- Using a while statement and an iteration variable, and the len function, we can construct a loop to look at each of the letters in a string individually

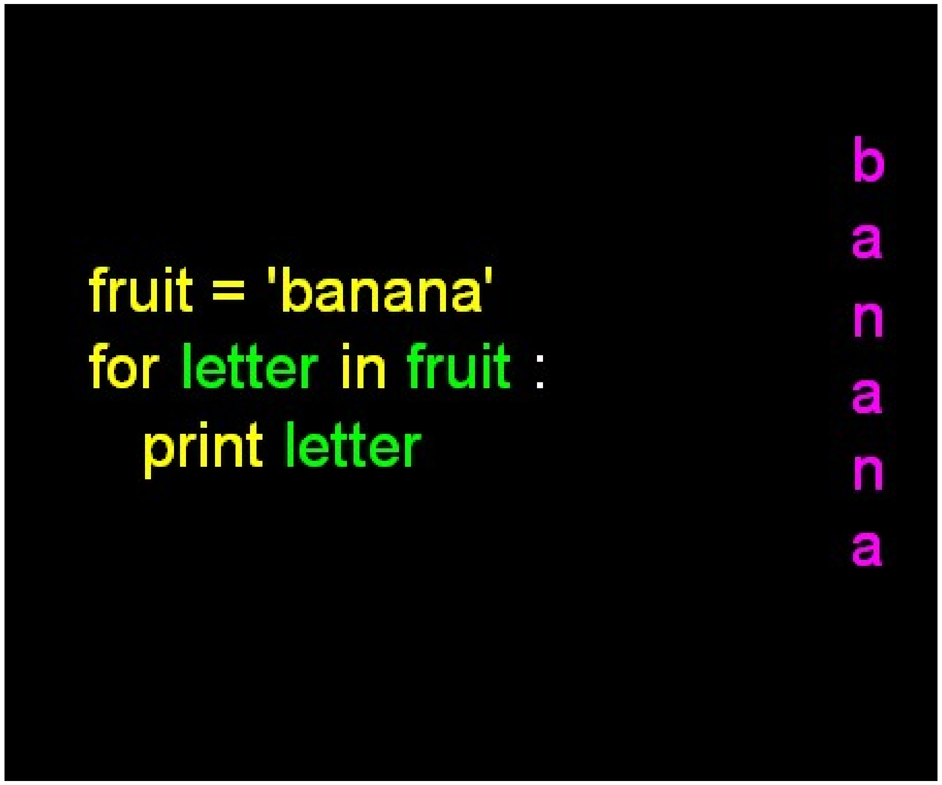


```
fruit = 'banana'                     0 b
index = 0                            1 a
while index < len(fruit) :           2 n
   letter = fruit[index]             3 a
    print index,  letter             4 n
    index = index + 1                5 a
```

Strings

Looping Through Strings:

- A definite loop using a for statement is much more elegant
- The iteration variable is completely taken care of by the for loop



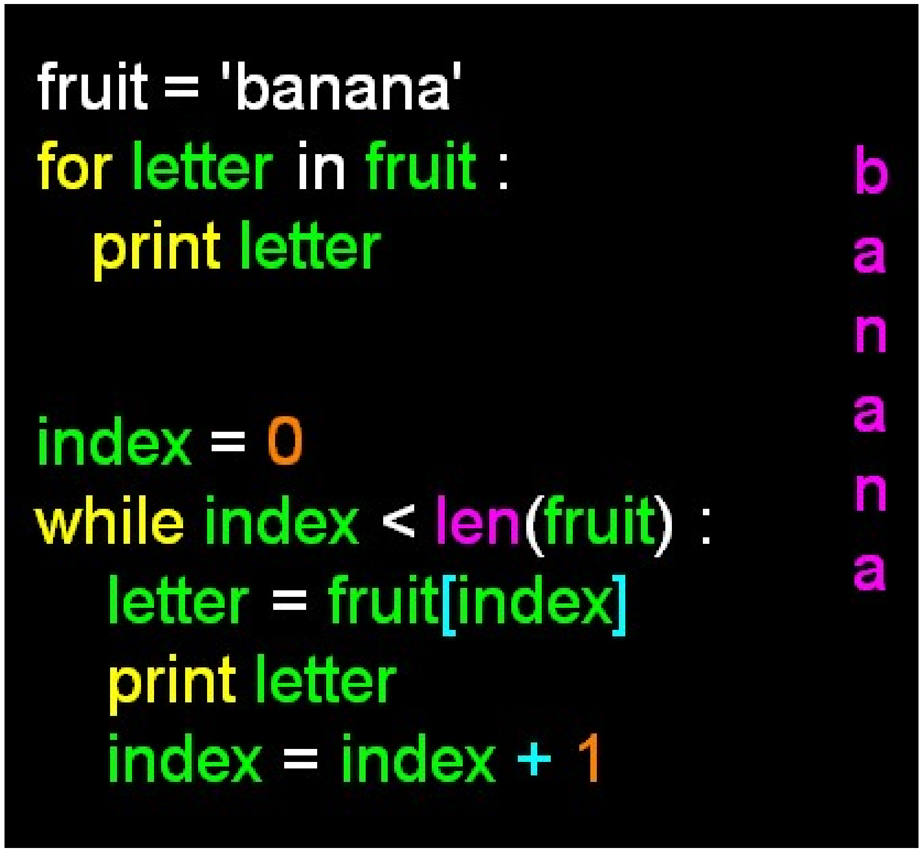
```
fruit = 'banana'
for letter in fruit :
    print letter
```

```
b
a
n
a
n
a
```

Strings

Looping Through Strings:

- A definite loop using a for statement is much more elegant
- The iteration variable is completely taken care of by the for loop



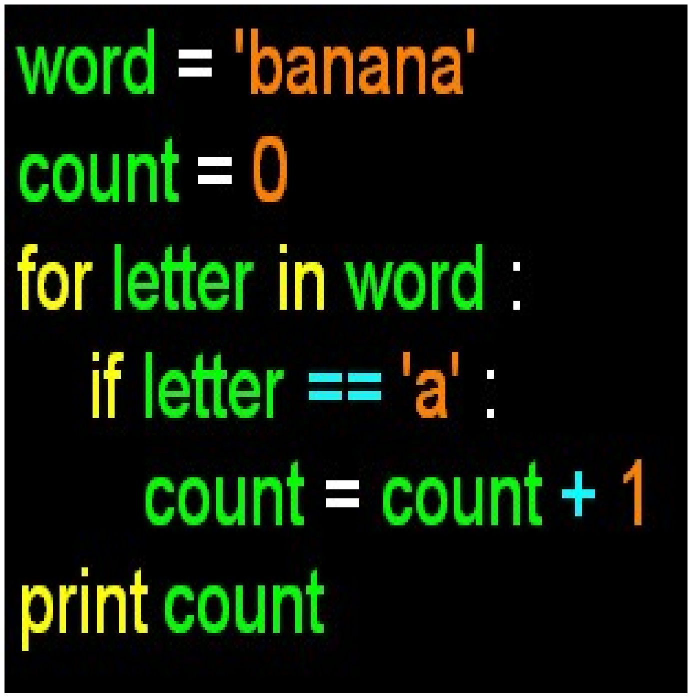
```
fruit = 'banana'
for letter in fruit :
    print letter

index = 0
while index < len(fruit) :
    letter = fruit[index]
    print letter
    index = index + 1
```

```
b
a
n
a
n
a
```

Strings

Looping Through Strings:

- This is a simple loop that loops through each letter in a string and counts the number of times the loop encounters the 'a' character

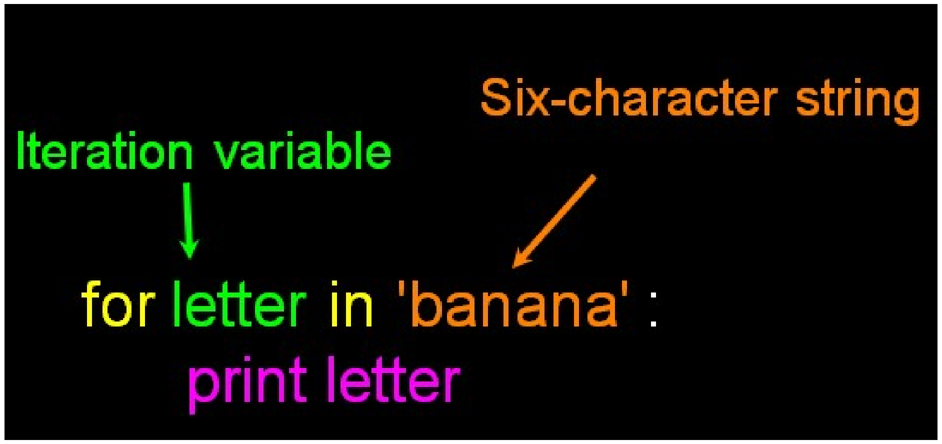


```
word = 'banana'
count = 0
for letter in word :
    if letter == 'a' :
        count = count + 1
print count
```

Strings

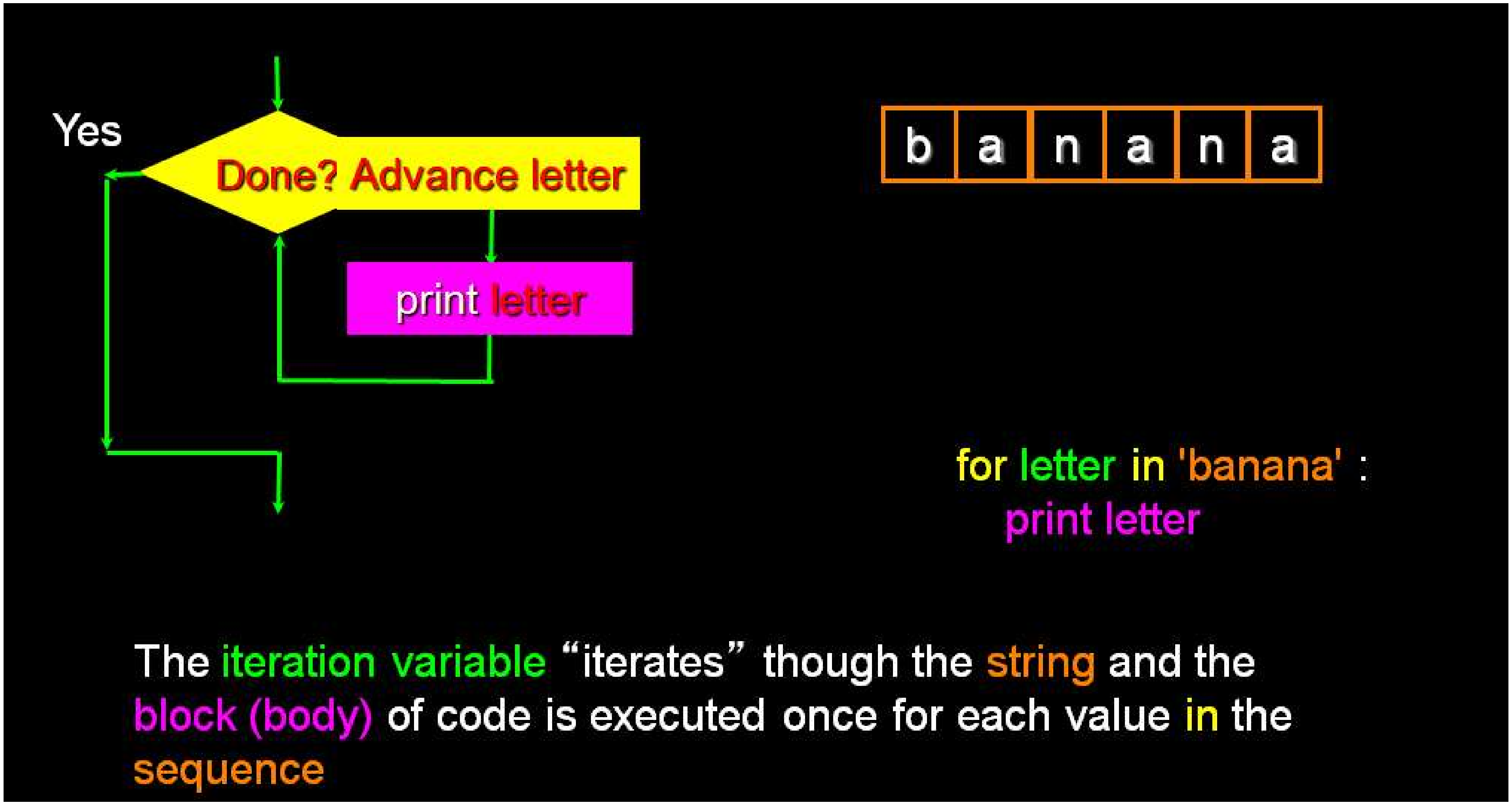
Looking deeper into in

- The iteration variable "iterates" though the sequence (ordered set)
- The block (body) of code is executed once for each value in the sequence
- The iteration variable moves through all of the values in the sequence



```
for letter in 'banana' :
    print letter
```

Strings

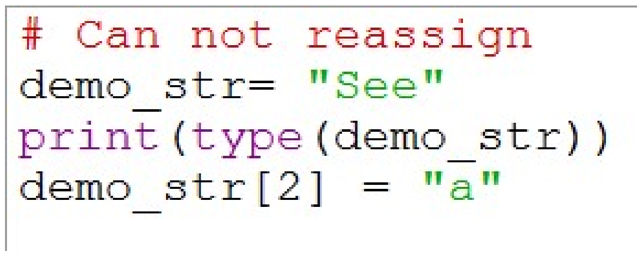


```
for letter in 'banana' :
    print letter
```

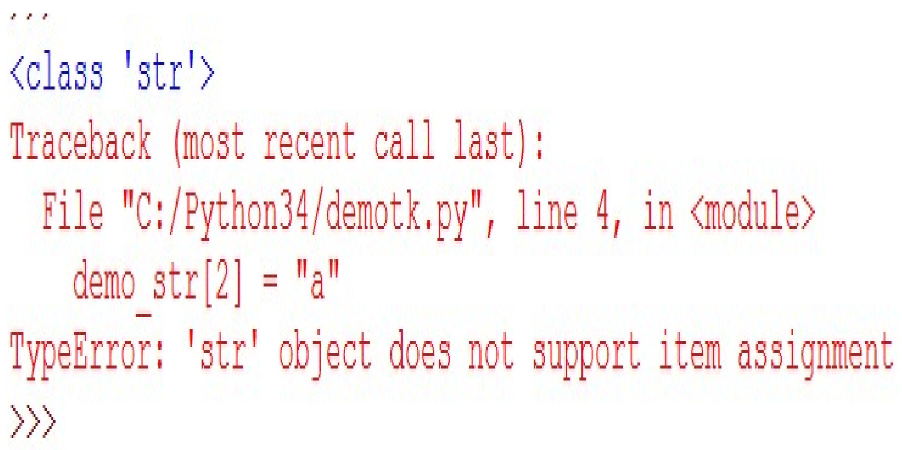
The iteration variable “iterates” though the string and the block (body) of code is executed once for each value in the sequence

String Immutability

- In python, the string data types are immutable. i.e., a string value cannot be updated.
- We can verify this by trying to update a part of the string which will led us to an error.



```
# Can not reassign
demo_str= "See"
print(type(demo_str))
demo_str[2] = "a"
```



```
...
<class 'str'>
Traceback (most recent call last):
  File "C:/Python34/demotk.py", line 4, in <module>
    demo_str[2] = "a"
TypeError: 'str' object does not support item assignment
>>>
```

Summary

- Strings Read/Convert
- Indexing strings using []
- Looping through strings with for and while
- Concatenating strings with +
- Strings are immutable

THANK YOU