

• String:-

. literal: "abcñáüöñö"

indexing [] s="apple" s[3] => "l"

Operations

+ concat \* repeat

len() length of string

Strings cannot be changed: "immutable"

• List.

a sequence of data items. this data items are called element.

data items can be any value allowed by python.

Literal [item, item, item, ...]

= items don't have to be of same kind

- the empty list []

= Lists can be nested.

Operators

len()

= assignment

NOTE: the meaning of =

• x = 3

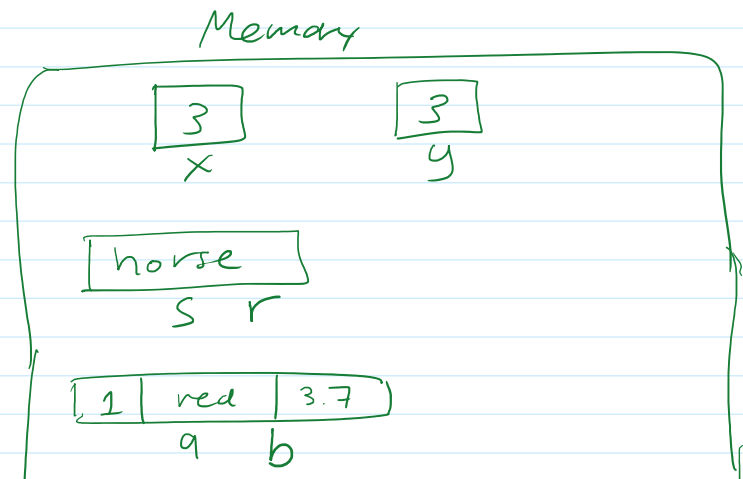
• y = x

• s = "horse"

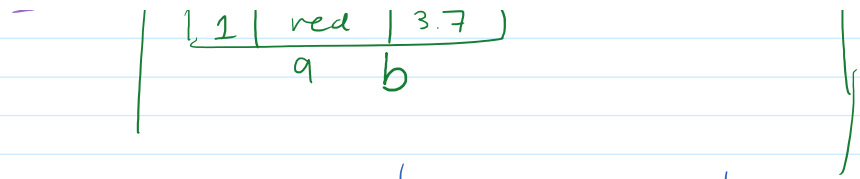
• r = s

• a = [1, "red", 3.7]

• b = a



•  $b = a$



★ = assignment on sequence types is not a copy.

Operator  $[i]$  to access a particular element.  
- positions start at zero  
- can be used on the left hand side of an assignment

$list(list)$  :- makes copies.

• "method" a function attached to a value.  
value.method(arguments)

• append(item)

• pop()

• remove(item)

• clear()

• + concatenates, copies items.

min(list)

max(list)

sum(list)

• count(item)

• Unpacking a list.

item, item, ... = list.

• Tuple

DEF: A sequence of elements (like a list)

once created a tuple cannot be changed

• immutable.

Literat

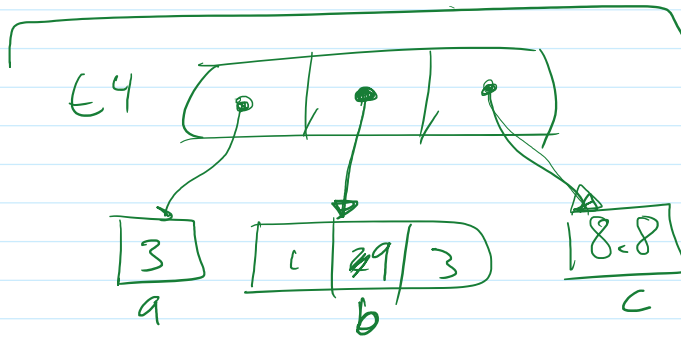
(item, item, item, ....)

## Operators.

- len()

- [] but only on the "right hand side"

- Unpacking is available.



## • Set

DEF: unordered collection of unique elements

Literal

{item, item, item, ...}

empty set set()

operations ~~[]~~

methods:

• add(item)

• remove(item)

• pop() - removes element at random

• clear()

• intersection(set)

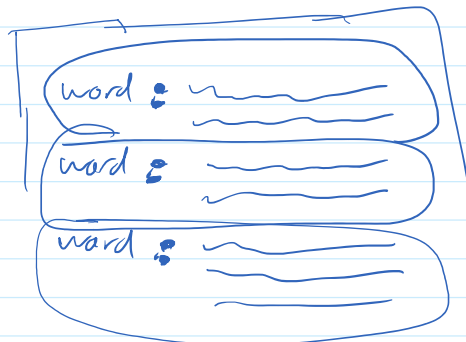
• union(set)

• difference(set)

## • Dictionary

("Map", "Hash-Table", "Hash-Map", ...)

Intuition:



• items come in pairs

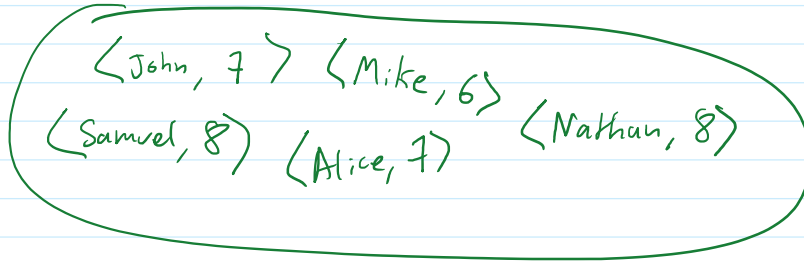
• "words" are unique

• built to be easy to find "words"

DEF. a collection of  $\langle \text{key}, \text{value} \rangle$  pairs

- keys are unique.
- values can repeat.
- design to look into elements by "key"

e.g.



Literal  $\{ \text{key} : \text{value}, \text{key} : \text{value}, \dots \}$

operator

$\text{dict}[\text{key}] \rightarrow \text{value}$

Can be used both to obtain values  
to add values.

- keys can be mixed;
- keys must be immutable values. ← integers  
← real  
← strings  
← tuple's
- values can be lists, sets, other dictionaries:

$\text{len}()$

•  $\text{pop}(\text{key})$

### • Constructors

$\text{int}(x)$   
 $\text{float}(x)$

$\text{str}(x)$   
 $\text{tuple}(x)$

$\text{list}(x)$   
 $\text{set}(x)$   
 $\text{dict}(x)$

### • Summary :

$\text{int}$   
 $\text{float}$

string

list  
dict

sets  
tuples.

~~CS-1500~~ EOF