Python course materials

# reduce()

Many times students have difficulty understanding reduce() so pay careful attention to this lecture. The function reduce(function, sequence) continually applies the function to the sequence. It then returns a single value.

If seq = [ s1, s2, s3, … , sn ], calling reduce(function, sequence) works like this:

* At first the first two elements of seq will be applied to function, i.e. func(s1,s2)
* The list on which reduce() works looks now like this: [ function(s1, s2), s3, … , sn ]
* In the next step the function will be applied on the previous result and the third element of the list, i.e. function(function(s1, s2),s3)
* The list looks like this now: [ function(function(s1, s2),s3), … , sn ]
* It continues like this until just one element is left and return this element as the result of reduce()

Let’s see an example:

from functools import reduce  
  
lst =[47,11,42,13]  
reduce(lambda x,y: x+y,lst)

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Lets look at a diagram to get a better understanding of what is going on here:

from IPython.display import Image  
Image('http://www.python-course.eu/images/reduce\_diagram.png')

png

Note how we keep reducing the sequence until a single final value is obtained. Lets see another example:

#Find the maximum of a sequence (This already exists as max())  
max\_find = lambda a,b: a if (a > b) else b

#Find max  
reduce(max\_find,lst)

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Hopefully you can see how useful reduce can be in various situations. Keep it in mind as you think about your code projects!