Sum selected numbers from a list

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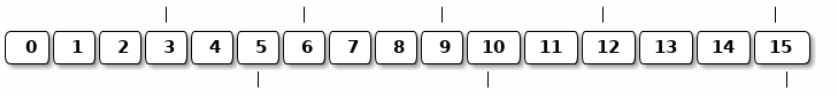
Sum of all positive multiples taken from a list

Problem: Find the sum of all positive multiples of 3 and 5 below 1000.

Pencil and paper



With the input of the pencil and paper part

We know that if we use the list [0, 1, 2, . . . , 15] the result should be 60. We also know that some of the numbers are part of both conditions: Some multiples of 3 are also multiples of 5, for example 15.

What we need for our program:

1. test for "divisible by n", here n = 3 n = 5
2. we want to keep track of the numbers that test True (for the above)
3. we want to test a lot of numbers in a non-repetitive way
4. we keep track of the hits

5. we sum our hits

We divided our problem up into some smaller problems:

ad 1) what does 'divisible by 3' mean? It clearly does not mean that n / == 0.

Take 6 divided by 3 = 2. We need to work with the remainder: 6 divided by 3 = 2 with a remainder of 0.

There is a function to calculate the remainder of a division: %.

6 % 2 = 0; 9 % 7 = 2

In our case, we can test for: x % 3 = 0 OR x % 5 = 0.

ad 2) If we have an empty list, we can add elements to it with the append function:

lst = [] lst.append(1) lst.append(2) lst # [1, 2]

ad 3) Which means we want to test each number in a list twice, with the first test (n % 3 = 0) and with the second test (n % 5 = 0).

So we need some logic. Let's try to write this "logic" down, using pseudo-code.

Pseudocode

input = lst1 result = lst2

for each element of input: if the element % 3 == 0: add the element to result or if the element % 5 == 0: add the element to result otherwise: go to the next element

show the result sum result

Using the REPL (iPython)

```
In [10]: input = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15]
In [13]: result = []
In [19]: for i in input:
    ...:     if i % 3 == 0 or i % 5 == 0:
    ...:         result.append(i)
In []: print(result)
Out []: [3, 5, 6, 9, 10, 12, 15]
In [21]: sum(result)
Out[21]: 60
```

Sum

Our (first) result is another list with the positive numbers taken from the input list that qualify as multiples of 3 or 5.

We need to calculate the sum of the elements of that list.

We could use another for-loop, something like:

sum_result = 0 for i in result: sum_result = sum_result + i return sum_result

But Python already has a sum function that works with lists, so the easy solution is:

sum(result)