

Readability vs. Speed

This lesson discusses a potential problem that arises when you use NumPy library.

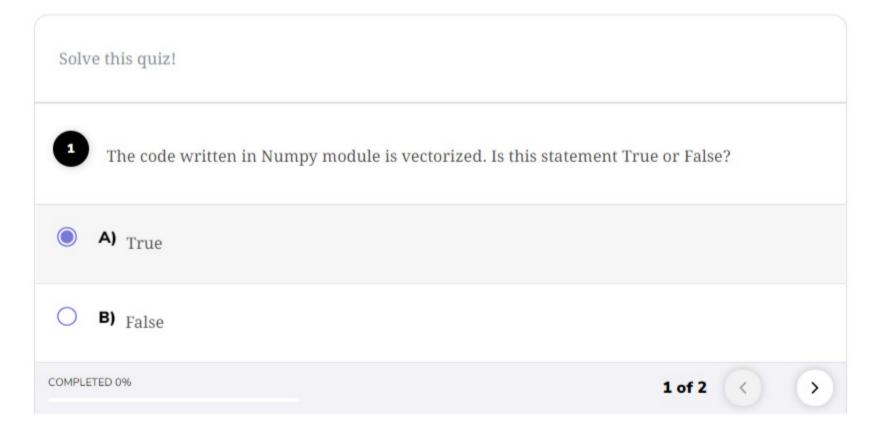
Before heading to the next chapter, I would like to warn you about a potential problem you may encounter once you'll have become familiar with NumPy.

It is a very powerful library and you can make wonders with it but, most of the time, this comes at the price of readability. If you don't comment your code at the time of writing, you won't be able to tell what a function is doing after a few weeks (or possibly days).

For example, can you tell what the two functions below are doing? Probably, you can tell for the first one, but unlikely for the second.

```
1 # More readability, less speed
    def function_1(seq, sub):
        return [i for i in range(len(seq) - len(sub) +1) if seq[i:i+len(sub)] == sub]
 6 def function_2(seq, sub):
        target = np.dot(sub, sub)
        candidates = np.where(np.correlate(seq, sub, mode='valid') == target)[0]
        check = candidates[:, np.newaxis] + np.arange(len(sub))
        mask = np.all((np.take(seq, check) == sub), axis=-1)
        return candidates[mask]
13 seq="Python to NumPy"
14 sub="NumPy"
15 print("Function 1:",function_1(seq,sub))
16 print("Function 2:",function_1(seq,sub))
                                                                                                             0
    RUN
                                                                                       SAVE
                                                                                                   RESET
                                                                                                             ×
Output
 Function 1: [10]
 Function 2: [10]
```

Here in this code, both the functions return the index of the substring in the string. The string is "Python to NumPy" and the substring is "NumPy". The index of the substring in the string is 10. As you may have guessed, the second function is the vectorized-optimized-faster-NumPy version of the first function. It is 10 times faster than the pure Python version, but it is hardly readable.



Now that we have a bit introduction to NumPy, let's move on to the next chapter "Anatomy of an Array".

