

## Hamming Coding Challenge

Coding challenges can be very simple, such as finding the hamming distance, as that is just loop over both strings and count the number of non-matches, assuming the strings are of the same length. But, it can also be a teaching tool, to help developers and those that write user stories to develop a deeper understanding.

So, in my commits you will see where I use the distance library, but I would need a requirements.txt for it to work, so it can be installed, but that would be one approach. There are a large number of libraries in python, so for many problems this could be useful. In my commit I made an error, and didn't put in the hamming function though, and the second parameter should be False.

So, finding a library is a valid solution, but if you give this to a developer as I describe in the beginning, then expect them to do it as my second commit, with a simple for loop, or look at the javascript solution. This is a valid approach, but in Python there is the Pythonic code, <http://docs.python-guide.org/en/latest/writing/style/>, so now would be a good time to teach the developer about zip, as it is more *pythonic* than a for loop (<https://stackoverflow.com/a/16326876/67566>).

Now, this is nice for short strings, but what if this is to be used for a human DNA strand. That is well over 100 million letters, so the next step for the developer is to write a unit test that randomly generates a string of 1 million, and for the second string have a random change, perhaps 1/1000, that it mutates so is a number instead of a letter. Then run their solution, having it print how long it takes to run.

This would be a good time to ask someone writing user stories to help out, as, given just the coding challenge, the first two are fine, but in a real problem the acceptance criteria is insufficient, as there should have been some information on size and time.

This can lead to a longer lesson on the various options to improve the performance, given the time requirements and larger size. This could also lead to discussions on TDD, as you wrote the unit test and had it fail and now the goal is to have it pass.

This one challenge can benefit not only developers but the rest of the team in how to look at user stories.