Part 1: Unit Testing

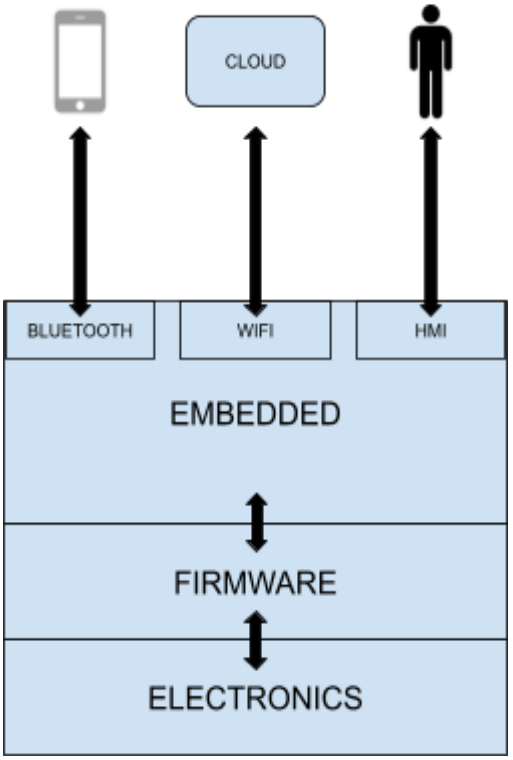
The exercise consists in implementing the three following problems in Python as parameterized functions. Also, add at least 2 unit tests for each function to verify that the implementation works as expected. Use a testing framework (for example PyTest)

1. A function that given 2 vectors of integers finds the first repeated number
2. A function that given a path of the file system finds the first file that meets the following requirements
    a. The file owner is admin
    b. The file is executable
    c. The file has a size lower than 14*2^20
3. A function that given a sequence of coin flips (0 is tails, 1 is heads) finds the minimum quantity of permutations so that the sequence ends interspersed. For example, given the sequence 0,1,1,0 how many changes are needed so that the result is 0,1,0,1

Send back the solution with a github link that contains the code and a README

Part 2: System Testing

Considering the following device



a) How would you test that the API between the embedded and the cloud is working as expected without having the real physical device

b) How would you test that the API between the embedded and the mobile is working as expected without having the real physical device