Algorithms and Data Structures - 11th Jan 2021

Note: write your solution straight in Python using the programming environment reachable by clicking on the Programmazione (programming) option on the exam.net left toolbar. Remember to choose Python as your development environment to be able to test your code.

Ex 1. Write a Python function to be named **primality_test()** taking, as input, a positive integer **I**. The function checks whether the provided input is a prime number (i.e., a number greater than 1 that can be divided only by itself and by 1). Then, two different types of output are possibile.

- If **I** is prime, the function returns the tuple **(True, None)**.
- If **I** is not prime, the function returns the tuple **(False, factors)**, where **factors** is a Python list of prime numbers so that their product is **I**.

Examples:

- **primality_test(11)** returns **(True, None)**.
- **primality_test(42)** returns **(False, [2,3,7])**.

Utility functions available in external libraries like Pandas or Numpy **cannot be used**.

Provide also a minimal working example where two different integer numbers (e.g., 47 and 56) are used to run the function.