**Python function determines whether an integer is a happy prime, sad prime, happy non-prime, or sad non-prime based on given criteria.**

A prime number is a natural number greater than 1 that cannot be formed by multiplying two smaller natural numbers.

A happy number is a number defined by the following process: Starting with any positive integer, replace the number by the sum of the squares of its digits, and repeat the process until the number either equals 1 (where it will stay), or it loops endlessly in a cycle that does not include 1. Those numbers for which this process ends in 1 are happy numbers, while those that do not end in 1 are unhappy numbers (or sad numbers).

For example, 19 is a happy number (and prime too), as the associated sequence is:

12 + 92 = 82

82 + 22 = 68

62 + 82 = 100

12 + 02 + 02 = 1

On the other hand, 17 is not a happy number (though it is a prime number too):

12 + 72 = 50

52 + 02 = 25

22 + 52 = 29

22 + 92 = 85

82 + 52 = 89 --- (\*) where it reaches 89, the number that was seen before (thus this process continues infinitely).

Code that endlessly loops, requesting/accepting an input integer from the user.