Quiz 3

Subject: Loops, conditional statements, basic arithmetic operations, lists and their functions

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Introduction

In this quiz, we expect you all to get practice on basic python commands, and also get experience with the programming environments, the user interface of the Integrated Development Environment (or IDE), python programming console, or terminal. This quiz consists of two separate parts *Problem1* and *Problem2*. You should handle each problem in a separate *.py* file and name it with the problem index; i.e., your solution should be named *quiz3-1.py* for the *problem1*.

0.1 Problem1: Sum of digits of x raised to n

For some x^n, find the sum of its digits until there is only a one digit. The order of command-line arguments:

```
python3 quiz3-1.py a b =>python3 quiz3-1.py 2 5
Output : 2^5 = 32 = 3 + 2 = 5

python3 quiz3-1.py 5 3
Output : 5^3 = 125 = 1 + 2 + 5 = 8

python3 quiz3-1.py 2 8
Output : 2^8 = 256 = 2 + 5 + 6 = 13 = 1 + 3 = 4
```

0.2 Problem2: Lucky Number

A Lucky Number is a natural number in a set which is generated by a certain sieve. This sieve is similar to the Sieve of Eratosthenes that generates the primes, but it eliminates numbers based on their position in the remaining set, instead of their value (or position in the initial set of natural numbers). The set of lucky numbers is taken from command line:

```
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22
```

Starting with 1, remove every other element from this set. We are left with:

```
1 3 5 7 9 11 13 15 17 19 21
```

After 1, the next number in the set is 3. So, remove every $3rd$ number. Clearly, 5 is removed because it's the third number in the above set. Go on and keep removing every $3rd$ number.

Your new set is:

```
1 3 7 9 13 15 19 21
```

Here, the next remaining number you have after 3 is 7. Now, at this point, it's obvious that there's no way 1 and 3 are ever getting eliminated. Thus, we can conclude that 1 and 3 are lucky numbers.

Now remove every $7th$ number. Clearly, 19 would be the first to be wiped out. This process continues until the list size is less than the defined number. You're left with:

```
1 3 7 9 13 15 21
```

Note: Your program should discard the numbers less than zero! The order of command-line arguments:

```
python3 quiz3-2.py "1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22"
Output : 1 3 7 9 13 15 21
```

General Notes

- Do not miss the submission deadline.

- Save all your work until the quiz is graded.

- Compile your code on dev.cs.hacettepe.edu.tr before submitting your work to make sure it compiles without any problems on our server.

- You can ask your questions via Piazza and you are supposed to be aware of everything discussed on Piazza.

- You must submit your work with the file hierarchy as stated below:

$$\rightarrow \text{<quiz3-1.py>}$$
$$\rightarrow \text{<quiz3-2.py>}$$