Self test questions: Comprehension

1. Create a list of all numbers between 0 and 100 that are not divisible by 3. (Hint: x is not divisible by 3 if x%3 != 0.)

2. Create a list of all numbers between 0 and 100 that are divisible by 3 but not by 7.

3. Create a list of all squares of numbers between 1 and 1000 such that the square has last digit 1. (Hint: You obtain the last digit of a number as the remainder of dividing that number with 10.)

4. Create a dictionary with comprehension that associates the key i^2 with the value i^3 for $i \in \{1,100\}$.

5. Create the set of all numbers between 0 and 999 that simultaneously have remainder 1 when divided by 2, have remainder 2 when divided by 3, have remainder 3 when divided by 4 and have remainder 4 when divided by 5.

6. Create the set of all differences of two integers chosen in $\{1,5,7,9,11,13\}$. This set contains 8 since 8 = 13-5 and it contains 4 since 4=11-7.

Solutions:

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[x for x in range(0, 101) if x%3]
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(If x%3 is not zero, then it is true.)

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[x for x in range(0, 101) if x%7 and not x%3]
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```
[i**2 for i in range(1, 1001) if i**2%10==1]
```

```
{i**2:i**3 for i in range(1,101)}
```

```
{x for x in range(1000) if x%2==1 and x%3==2 and x%4==3 and x%5==4}
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a_set = {1, 5, 6, 9, 11, 13}
sorted({i-j for i in a_set for j in a_set})
```
You do not need to use sorted of course, but the result is easier to digest with it.