



PyQB

Monga

OO
encapsulation

Random
numbers

Programming in Python¹

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Lecture X: OOP

Object Oriented encapsulation



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Encapsulation is so important that it is used also at a higher level: a collection of related procedures.

```
x = 666
```

```
def increment():  
    x = x + 1
```

```
def decrement():  
    x = x - 1
```

Again: this is correct Python code, but it has problems:

- Both the functions depends on `x` but this is not clear from their **signature**: a user must look at the internal details
- The two functions cannot be reused individually, but only together with the other (and `x`)

Classes



A **class** is a way to package together a collection of related functions. The class is a “mold” to instance new **objects** that encapsulated the related functionalities.

```
class Counter:
    def __init__(self, start: int):
        self.x = start

    def increment(self):
        self.x = self.x + 1

    def decrement(self):
        self.x = self.x - 1
```

```
c = Counter(666)
c.decrement()
d = Counter(999)
d.increment()
```

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Random numbers

Pseudorandomness: the sequence of numbers is not predictable...

```
from random import randint
```

To get a random integer x in the set [1..10]

```
x = randint(1, 10)
```

```
from random import randint
```

```
for _ in range(0,10):  
    print(randint(1, 100))
```

unless you know the **seed**.

```
from random import seed, randint
```

```
seed(292)
```

```
for _ in range(0,10):  
    print(randint(1, 100))
```

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Write a Python program which chooses an integer 1–10 and asks to the user to guess it

- if the number given by the user is not 1–10, it prints “Invalid”;
- if the number is the chosen one, it prints “Yes!”;
- otherwise “You didn’t guess it...”.



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Evolve the program: it should now ask until the user guess the number correctly, giving hints (“higher...”, “lower...”).

Exercise



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- otherwise “You didn’t guess it...” .

Evolve the program: it should now ask until the user guess the number correctly, giving hints (“higher...”, “lower...”).

How many tries in the worst case? Can you write a program guessing a number between 1 and `int(1e32)`

Homework



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- <https://classroom.github.com/a/YYWjMaR2>