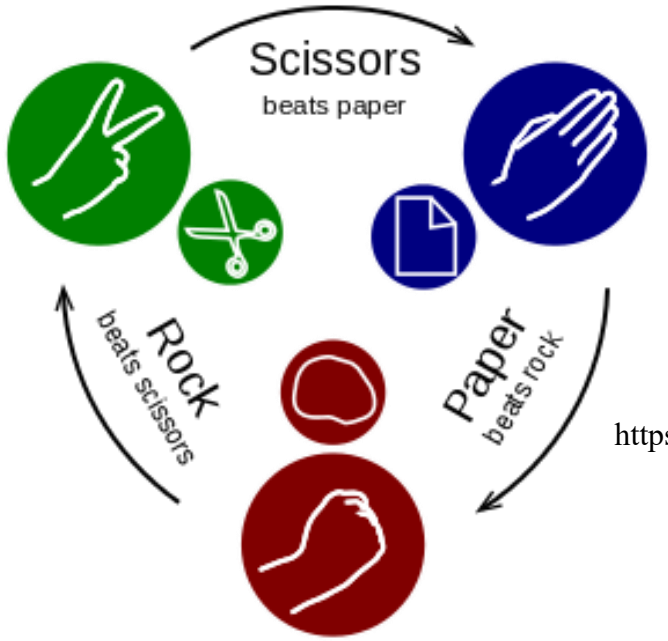
A big challenge in learning programming is how to translate your thoughts to (Python) code.

The only way is to do lots of programming.

Labs and this mini-project

Develop the classic game rock-paper-scissors in Python

It is a simultaneous game with two players. Each player chooses one of rock, paper or scissors, without knowing the other one's choice. The rules are: rock beats scissors; scissors beat paper; and paper beats rock. It is a tie if both players make the same choice.



https://en.wikipedia.org/wiki/Rock%E2%80%93paper%E2%80%93scissors

Develop the classic game rock-paper-scissors in Python

- There are two players:
  one player is a human user
  the other player is a (simple) computer algorithm

- The Python program of the game can be divided into several functions.

- The task is to implement these functions in Rock_Paper_Scissor.ipynb.

Develop the classic game rock-paper-scissors in Python

a record of the game

Human	Computer	Outcome (0,1,2)
paper	rock	2: human wins
scissors	rock	1: computer wins
paper	scissors	1: commuter wins
rock	rock	0: a draw/tie

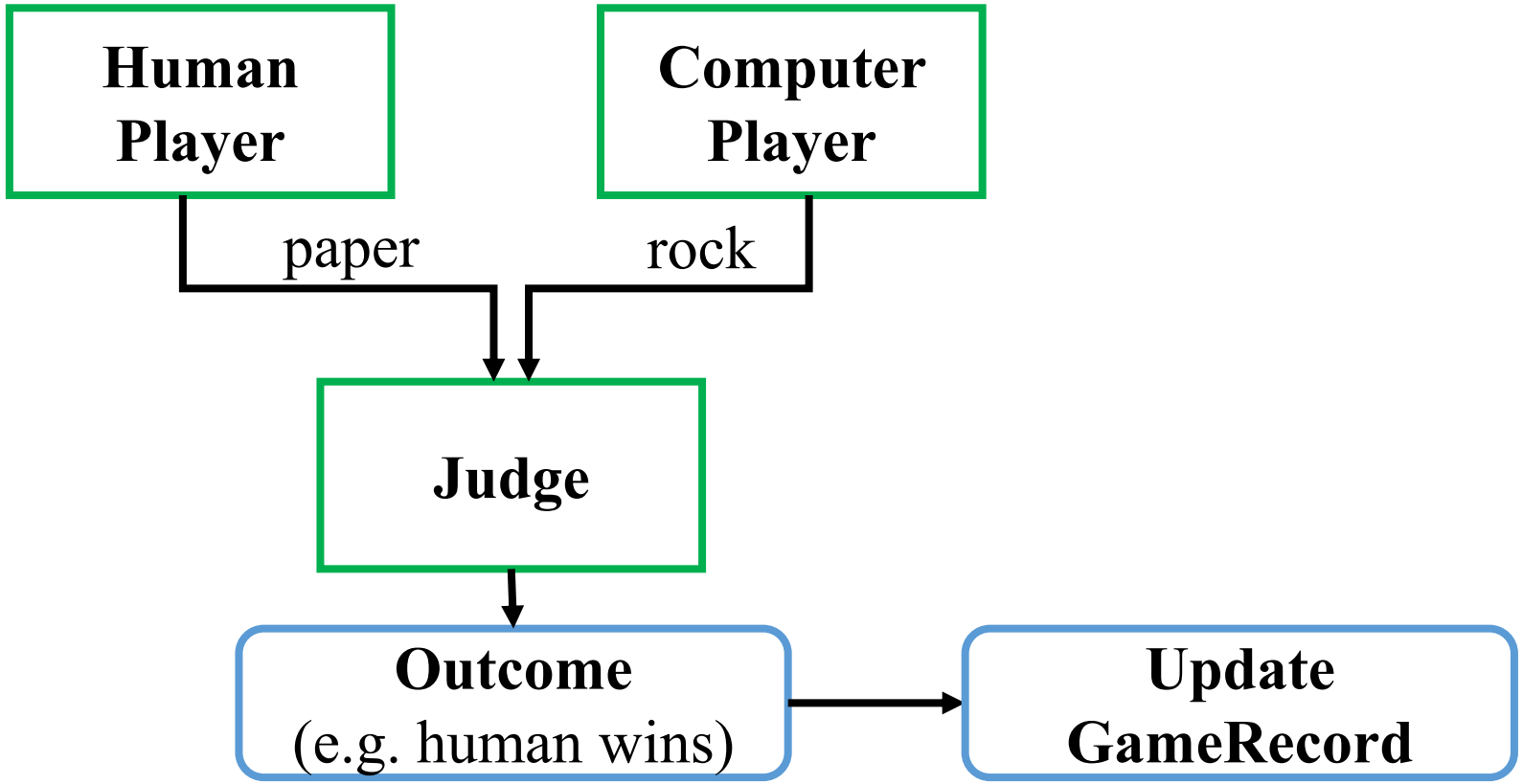
Use a dictionary to keep the record of the game:

GameRecord={'Human':['p', 's', 'p', 'r'] , 'Computer': ['r', 'r', 's', 'r'], 'Outcome': [2, 1, 1, 0]}

Develop the classic game rock-paper-scissors in Python

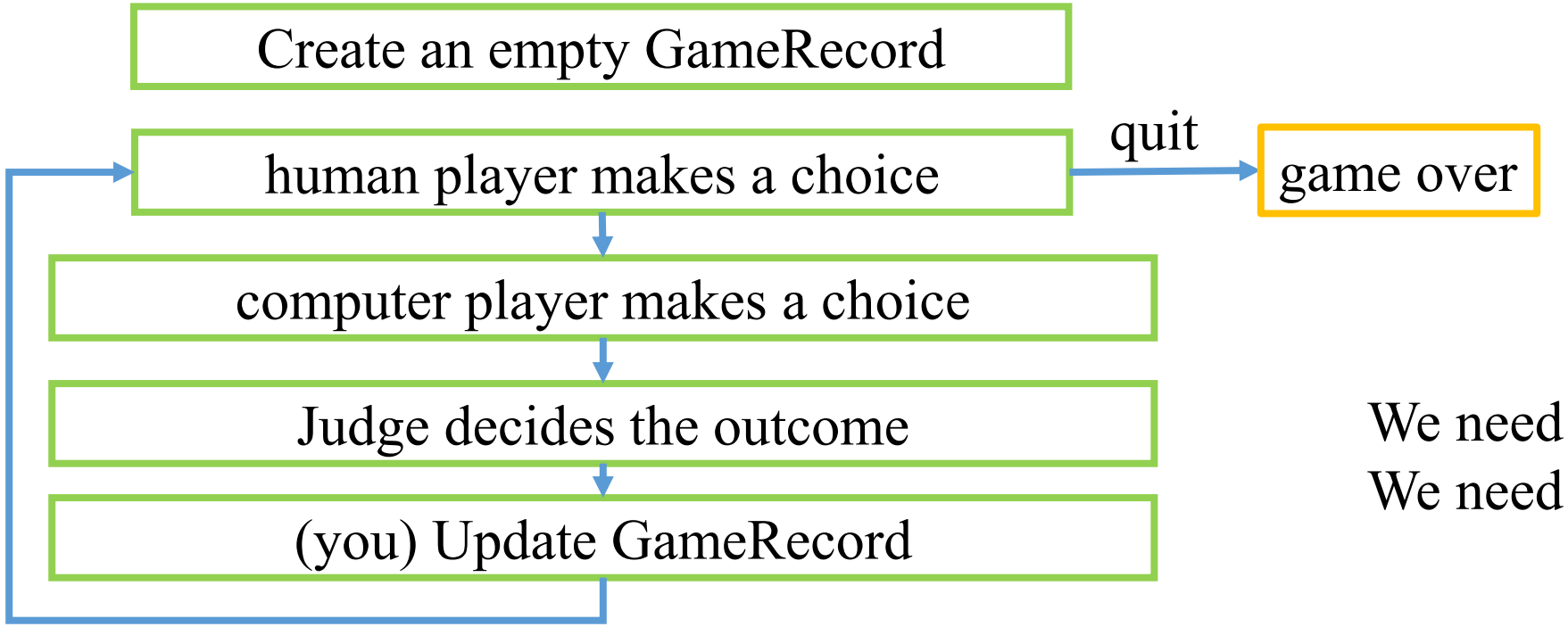
- Think about how to divide a large program into many small functions that are easier to be implemented.

Flow chart



Develop the classic game rock-paper-scissors in Python

```
def PlayGame():
    '''
    This function defines the process of the game
    '''
```



We need a while loop
We need to break the loop

Develop the classic game rock-paper-scissors in Python

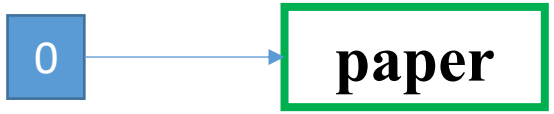
- Computer Player will use a simple algorithm: random choice

	paper	**rock**	**scissors**
probability:	1/3	1/3	1/3

We will use the **randint** function in a Python library named **random** try the function, then you will figure it out

```
1 #%%
2 from random import randint
3 x=randint(   )
```

integer



- More algorithms on http://www.rpscontest.com/

"Although rock-paper-scissors (RPS) may seem like a trivial game, it actually involves the hard computational problem of **temporal pattern recognition**. This problem is fundamental to the fields of machine learning, artificial intelligence, and data compression. In fact, it might even be essential to understanding how human intelligence works." - www.rpscontest.com

"This website is intended to host an ongoing competition to rank RPS programs. All submissions must be made using the **Python programming language**. The source code for all submissions will be publicly viewable. You may make as many submissions as you like. **May the best AI win!"**