

Better Programming

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March 23, 2021

Abstract

Every one has *computer*. It computes at a very high speed. Basically, you put your data in *objects*, and generate *functions* to do the computation. The *languages* are the communication between you and the computer. And the *algorithms* are the tools of how to do the computation precisely and quickly. A good *programming* is about all of the above, you have to manage them, like the arm controls the hand.

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1 Computer

The computer is PC or laptop in real-world. But in programming, the computer can be a very *abstraction* concept.

- Input
Used for user input
- Output
Used for output to screen or speaker
- Memory
Where the variables stay during computing
- Disk
Where the files stay forever

1.1 Input & Output

The input and output are concepts between the computer and users. Input means message from user to computer, and output means the reverse. They are applied in different syntax in different language. Take *Python* and *JavaScript* for examples.

Listing 1: InputOutput.py

```
1 '''
2 File: InputOutput.py
3 Aim: Example of input and output in Python
4 '''
5
6 # Input
7 inp = input('Input:')
8
9 # Output
10 print(f'You just inputted: {inp}')
```

Listing 2: InputOutput.js

```
1 /*
2 File: InputOutput.js
3 Aim: Example of input and output in JavaScript
4 */
5
6 // Input
7 const inp = prompt("Input:");
8
9 // Output
10 console.log("You just inputted:", inp);
```

1.2 Memory

When you practice programming, all the variables, functions and objects in your code is in the memory. More about memory can be found in the section of Objects. In current stage, all you have to know is everything you do during your programming is in the memory. In another word, the computation equals to the operation to the memory.

1.3 Disk

After computing, users may have their stuff to be stored forever. The disk is where to put them.

It should be noticed that it can be very different between the things in memory and their storage in disk. For example, an article is structured as a characters array in the memory. However, it is stored as a highly compressed binary series in the disk. Although the difference between the two formats, they are the same article in fact.

At the viewpoint of the memory, there are fine programs to save the data to and read the data from the disk. In ideal condition, The two-way process is *transparent* to the user, which it frees the users to think about the conversion, thus the users can focus on the object in memory during computation.

2 Objects

3 Functions

4 Languages

5 Algorithms