# Learn

*a notebook for Richard*

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Never forget how difficult to beg something on sb

Be happy, whenever, wherever, with whoever

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# 1 Introduction

- 希望大佬多多指点
- **Emoji**
  - 🌟: 有扩展芝士~
  - 👍: 赞！ 赞！！ 赞！！！
  - 🈳: 未完待续哦 👶

# 2 LeetCode

## 2.1 two sum

**1.** 组合问题，For 从第一（i）项开始，内 For 永远从 i+1 项到列表尾，组合两数之和。

**2.** 无论是 in, .index() 等等的函数**都会从左到右只获取第一次出现的索引**，当列表内数字重复会引起错误。因此创建带有索引的变量：字典等。

第一次 for 将值按顺寻存入字典，第二次 for 需注意 target 减去当前数所得数在此列表内，**且这个数不是当前数**：

dic ( target-array[i] ) != i        # dic= array_value : index_i

👍**3.** 仅用一次 for，将 target 减去当前值**是否存在于**遍历过的值:

past=[ ]

for... : if target - array[i] in past: return...

else: past.append(array[i])

## 2.2 add two numbers

分析发现仅对应位置相加，大于 10 进 1。有以下要注意的点：

- 根据调节扩大链表，则需要 new_l=ListNode(0) 写作循环内，由于需要链接起来，则会覆盖地址 out_l=new_l，因此 out_l 已经被覆盖，所以要在循环外提前复制

- 是否进位（carry），需要对两数**及上一个进位**相加，并判断是否大于**等于** 10。

- 两种思路：1. l1 != **None** or l2 != **None** or carry != 0 进入遍历，else 输出。2. l1 == None and l2 == None and carry ==0 输出，else 遍历（l1 或 l2 单独为 None 时为其链接 ListNode(0)）

## 2.3 ...

# 3 Java

## 3.1 Integer 与 Boolean 不相容

```
int x=1;
boolean is = true;
while (x) { }        ❌
while (is) { }       ✔️
```

## 3.2 ...

# 4 Python

## 4.1 Python 钢琴手法 🈳

- **expression1 if condition else expression2**
  五个成分，不能多一个，也不能少一个！

```
print('hhh') if True else print('zzz')        >>> hhh
0 if Flase else print('zzz')          >>> zzz
0 if True else print('zzz')          >>> (output)0
```

-

## 4.2 列表内数~~索引和排序 🌟

2 ways add index: array ⇒dic or array ⇒enumerate(array, start) # start means getting items from "start" to end

sort(key= function, reverse= T\F) noReturn

sort() **only** used in array:

```
def absulate(n):
return abc(n-5)
a=[1,3,10]
print(a.sort(key=absolute))
>>> [3,1,10]
```

有时也会用 sort() 对字典 key 或 value 进行排序，(利用元组)：

```
dir={ 'b':1, 'a':2, 'c':3 }
lst=list(dir.items())             >>> [(b,1), (a,2), (c,3)]
lst.sort(key= lambda x:x[1])             >>> [(b,1), (a,2), (c,3)]
lst.sort(key= lambda x:x[0])             >>> [(a,2), (b,1), (c,3)]
```

sorted( iterable, cmp, key, reverse) ReturnList

sorted used in all kinds of iterable objects.

2 ways sorting 字典

```
dir={ 'b':1, 'a':2, 'c':3 }
```

**1:** lst= sorted(dir.items(), key=lambda x:x[0])    >>> [(a,2), (b,1), (c,3)]

**2:** import operator

lst= sorted(dir.items(), key=operator.itemgetter(1))    >>> [(b,1), (a,2), (c,3)]

发现输出结果都是**列表** [**元组**] 的形式，因此对于一个数字集合（列表），要求加上索引（目的：hashmap 或 避免重复数字.index() 总返回最左侧），通常将此数字列表转换为**字典**或**列表** [**元组**]。**若需要对其排序：** list →dic →sorted list[tuple]，此过程的第一步需要一次 for 的遍历才能完成。下面介绍 enumerate() 来减少一次遍历：

lst=[’b’, ’a’, ’c’]

l0=sorted(enumerate(lst), key=lambda x:x[0])      >>> [(b,1), (a,2), (c,3)]

l1=sorted(enumerate(lst), key=lambda x:x[1])      >>> [(a,2), (b,1), (c,3)]

🌟 使用 max(),min() 寻找字典 key 和 value 的最值：

m=max(dir.items(), key= lambda x:x[0])      >>> key 中最大值 mi=min(dir.items(), key=lambda x:x[1])      >>> value 中最小值

## 4.3 lambda review

lambda Input ：**Expression** 是一个表达式，表达函数功能。

Fnc_name = lambda Input ：**Expression**

调用该函数：>> Fnc_name( an entity of Input )

Exp1:

def ABC(n):

return lambda x ： abc(n-x) # ABC 是一个取绝对值函数，内嵌了一个（lambda 表达）函数取绝对值前要先减去一个值

a=ABC(10) #a 是一个（lambda 表达）函数，能取得 10 减去**输入**的绝对值

a(19)                >>> 9 #output

Exp2:

b=lambda x : lambda y : x+y

a=b(9) # 9 这个输入对应 x，即 b 函数的输入，b 运行 lambda y : 9+y，即 a 为这个新函数

a(1)   >>> 10 # 1这个输入对应y，即a这个新函数的输入，a执行9+1

### 4.4 ...

## 5 Hardware

### 5.1 BIOS

Basic input output system (一段程序，代码) 专门负责系统硬件的初始各个参数的分配。The first assembly language CPU run.

MBR ⇀GPT(Leagcy BIOS) ⇀UEFI BIOS: GPT's LBA0 stores MBR, so GPT expends more memories as computer hardware updates. UEFI use C language as a junior system, easier to develop and adapt to more platforms. has secure boot to verify system.

### 5.2 ...

## 6 LaTeX

### 6.1 同时使用 emoji 和中文，compiler option

Package "emoji" can be compiled only in **LuaLaTeX** compiler. For "中文", Package "ctex" can be used in **LuaLaTeX**, and Package "CJKutf8" can be used in **pdfLaTeX, LaTeX**.

**CJKutf8:**

```
\usepackage{CJKutf8}
\begin{document}
\begin{CJK}{UTF8}{gbsn} %gbsn is 宋体
Your content ...
\end{CJK}
```

```
\end{document}
```

## 6.2 文字内插图问题

1. package 'graphicx' is 'graphics' extension. It supports more packages and patterns.

2. 👍Insert figure into words use 'picinpar' package

   Example:

   ```
   \begin{window}[num,r,   %
   {\includegraphics [ width=.5 \linewidth ] { figure_location } },   %
   {\centering caption_name}]
   your words ....
   \end{window}
   ```

   "window" can be replaced by "figwindow" or "tabwindow"

   "num" means what distance the figure is higher than words.

   "r" can be replaced by "l" or "c" meaning left or center

   "\centering" can be replaced as adding label: \label{label_name}

   % \ref{label_name} can be linked to label

3. Insert figure using 'wrapfig'

   Example:

   ```
   \begin{wrapfigure}[12]{r}[0em]{.3\textwidth}
   \centering
   \includegraphics[width= 0.4\textwidth]{figure_location}
   \end{wrapfigure}
   ```

\begin{wrapfigure}[图占字的行数]{位置}[图超出文本边界长度]{图宽度}, 其中**行数**和**超出长度**可以省略，则分别自动计算和设为0pt, 位置有’r’,’l’,’i’ 双面格式页面靠里,’o’ 页面靠外

### 6.3 ...

## 7 Others

### 7.1 Download Video from website 🈳

Videos types: files or urls only have two kinds of suffix: **.mp4** and **.m3u8**

- **.mp4:** open developer tools →Network →Media →play the video →right click the ”.mp4” item and ”Open in new tab” →”...” bar has download.

- **.m3u8:** developer tool →network →**media or JS** →play video →copy url with **.m3u8** suffix →open **ffmpeg** file, run cmd, run ffmpeg →”ffmpeg -i ***(the .m3u8 url) -c copy ***(download video name and type)”

  **Example:** ”ffmpeg -i https://iqiyi.abc/206_f524f/index.m3u8 -c copy 123.mp4”

  **-i:** set input

  **-f:** set output

  **-y:** 输出文件已存在则覆盖

  **-fs:** 超过指定文件大小则结束转换

  **-c:** 指定输出文件的编码

  **-help:** command inf.

## 7.2 FFmpeg+SDL make player

### 7.2.1 视音频基础

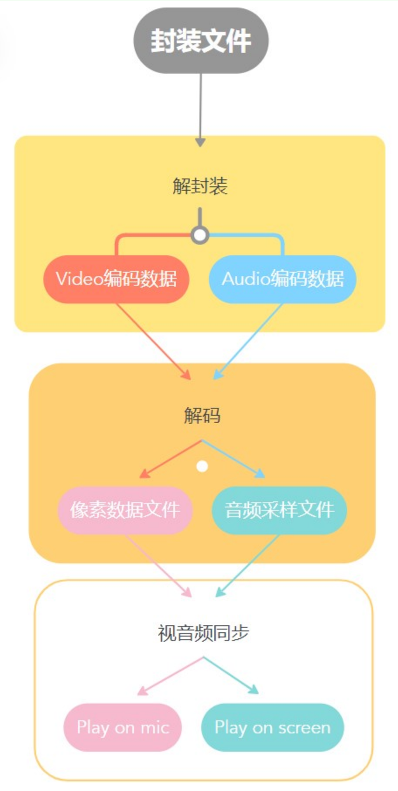

图 1: 视频播放原理

**1. Encapsulation file**

**封装:** 音流、视流 → 一个文件

**Type:** .mp4 .rmvb .ts .flv .avi .mov 等等

**Tool:** MedfiaInfo (shows details inf. of the file), Elecard Video Format Analyzer (analyze the file format)

**Example:** MPEG2–TS: made of with 188 bytes TS "packset" files (..."packset""packset""packset"...)

FLV: non-fixed size Tag files with head files ("FLV Header""Tag metdata""Tag data""Tag data"...)

So, if you have a length of MPEG2–TS video file, it can be played. But if you have a length of FLV video file (without head files), it **can't be played**.

**2. 视频编码文件（视频流文件）**

**解码:** 像素点文件相当大，不利于保存，因此通过算法编码为视频流文件

**Type:** H.264, MPEG2, VC–1 等等

**Tool:** Elecard Stream Eye: a video encoding analyzer

**Example:** H.264: The most popular method with 100 times compression, made of with non-fixed size "NALU" files (..."NALU""NALU""NALU"...)

**3. 像素文件**

**Type:** RGB24, RGB32, YUV420P, YUV422P, YUV444P, P8, P9 等等

**Tool:** YUV Player: play YUV files

**Example:** RBG24: RBG 分别对应 I 帧、P 帧、B 帧 (...”RGB””RGB”...)
YUV420P: Popular one. Y controls luminance, UV controls hue. (”Y””Y”...”U””U”...”V””V”...)
Researches shows that human eyes are more sensitive to the brightness rather than hue.

How much memories 25 frames, 1 hour, 1920×1080 screen, a video needs? (25 frames playing 25 pictures in 1 second; 1 pixel needs 3 bytes memories)
3600×25×1920×1080×3=559.9 G Bytes

**4. 音频编码文件（音频流文件）**

**Type:** ACC, mp3, AC–3, WMA (Microsoft)

**Tool:** Adobe Audition

**Example:** AAC: about 10 times compression, made of with non-fixed size ”ADTS” (...”ADTS Pkt”...)

**音频采样文件**

**Type:** PCM 双声道 binaural: ”L””R””L””R”...

**Example:** How much memories 4 miniutes, sample rate 44100HZ (人耳的声波听力范围是 20Hz~20kHz，奈奎斯特定理指出抽样频率必须是最大频率范围的两倍), sampling accuracy 16 bit, an audio needs? 4×60×44100×2×2= 42.3 M Bytes (binaural)

### 7.2.2 FFmpeg Commands

## 7.3 Windows(DOS) Command

### 7.3.1 文件查找、删除

>dir 列出当前位置（目录）下文件

>dir d:\ 列出 d: 盘下的文件及文件夹

>dir /b /s (d:\)”*visua*” 查找 d: 盘下命名有 visua 的所有文件及目录，/b 使用空格式，/s 指 d: 盘目录下及其子目录下所有。如果去掉/s 之查找 d: 目录下。

### 7.4 。。。

1234

# 8 TED

## 8.1 spirit

- The Software technology brings more loneliness
  - One day, my father said he want to go out for running. He wanted my Mon to come with him with the reason that he might fall down or had an accident. And the sky was so dark that no one could see and help him. However, my Mom said she had exercised when doing the housework. Then I just shot that they both need an Apple watch because it can help you call the police when accident happens. 如果有了它，那人们将更加孤立。
  - During the epidemic, all the courses were online. Since the college provided the recordings of lectures, more and more students refused to go offline classes with their classmates, refused to open their cameras to meet their classmates, refused to have some small talk with classmates, finally suited themselves in late get up, watching recordings in bed. Although enjoying themselves, their life are losing contact, losing friends. When they get used

to this life style, they would feel difficult to come out ever, to say something to others never.

- when a new fancy IT technology or so called AI product coming, the designers, the developers, the sellers, the audiences, the users were so addicted to their remarkable strengths. I never doubt about that. But what about the weakness? have the designers, the developers, the sellers tell the weakness? or even thinking about it? IT technology has been playing a essential role in our life, just as medicine. It is time to think about the other side of IT technologies. We built food safety branch in food study, built well-being branch in medicine study, built 犯罪心理学 branch in human behavior study, built lots topics to solves some kinds of education's weakness, actually we have built every risk researches in every study. And no matter my teachers, my parents, my friends, or even wisest men in history told me to reflect. It's time to reflect on risk of IT technologies.
- one of my friends told her parents she fell in love with a boy who was so wonderful in achievements, appearance, characters and ... Well, as she thought her parents would have no reason to refuse this wonderful boy as her daughter's husband, her father asked "can you tell me about his shortcomings?"

## Table of Figures