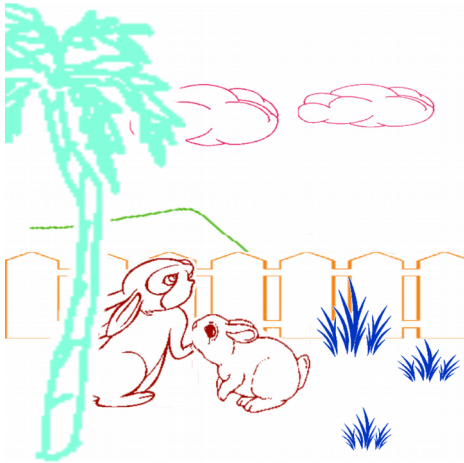


任务

- 给定 500 张 750x750 的图，和其对应的 json 文件（json 里面记录了图中元素的标签和坐标以及遮挡关系）。下载链接:<https://pan.baidu.com/s/1mjiBFZi> 密码:aqr0 （前 500 张图做测试）



如图为一个例子，右侧为 json 文件内容：有 category 描述；zIndex 大的表示遮挡 zIndex 小的元素（比如图中树遮住了部分云）；坐标上左+宽高表示。

```
[{"oid":"cloud1","category":"cloud","src":"/sketest/public/images/category_ctest/cloud_test/cloud_21.png","zIndex":"1","top":"130px","left":"200px","width":"240px","height":"100px","transform":"none","checked":false}, {"oid":"cloud2","category":"cloud","src":"/sketest/public/images/category_ctest/cloud_test/cloud_21.png","zIndex":"2","top":"130px","left":"470px","width":"220px","height":"70px","transform":"none","checked":false}, {"oid":"mountain1","category":"mountain","src":"/sketest/public/images/category_ctest/mountain_test/mountain_11.png","zIndex":"3","top":"350px","left":"40px","width":"710px","height":"100px","transform":"matrix(0.973461, 0.228852, -0.228852, 0.973461, 0, 0)","checked":false}, {"oid":"fence2","category":"fence","src":"/sketest/public/images/category_ctest/fence_test/fence_45.png","zIndex":"4","top":"400px","left":"0px","width":"750px","height":"140px","transform":"none","checked":true}, {"oid":"grass2","category":"grass","src":"/sketest/public/images/category_ctest/grass_test/grass_5.png","zIndex":"5","top":"540px","left":"630px","width":"100px","height":"70px","transform":"none","checked":false}, {"oid":"grass3","category":"grass","src":"/sketest/public/images/category_ctest/grass_test/grass_5.png","zIndex":"6","top":"650px","left":"540px","width":"80px","height":"70px","transform":"none","checked":false}, {"oid":"rabbit1","category":"rabbit","src":"/sketest/public/images/category_ctest/rabbit_test/rabbit_123.png","zIndex":"7","top":"410px","left":"80px","width":"230px","height":"240px","transform":"none","checked":true}, {"oid":"rabbit3","category":"rabbit","src":"/sketest/public/images/category_ctest/rabbit_test/rabbit_122.png","zIndex":"8","top":"500px","left":"300px","width":"190px","height":"160px","transform":"none","checked":true}, {"oid":"tree3","category":"tree","src":"/sketest/public/images/category_ctest/tree_test/tree_376.png","zIndex":"9","top":"0px","left":"-150px","width":"440px","height":"740px","transform":"none","checked":false}, {"oid":"grass4","category":"grass","src":"/sketest/public/images/category_ctest/grass_test/grass_5.png","zIndex":"10","top":"500px","left":"500px","width":"120px","height":"130px","transform":"none","checked":false}]
```

- 要求根据 json 文件用编程实现图的文字描述（天气→环境→物体）。

It is a **cloudy** day. There are mountains in the distance. There is a tree in front of fences. The rabbits are **grazing** on the right side of the tree.

- 再举个例子



json 文件中元素遮挡顺序：tree-tree-horse-horse-house-chicken-fence-fence-duck-duck-chicken-sheep-cow-grass-grass

可以看到是有规律的，从上往下一层一层描述的。

There are trees in the distance. The horses are on the left side of the tree. There is a house in front of the trees. The chicken is on the house. There are fences on the left side of the house. The ducks are on the fences. The chicken is on the fences. The sheep is **grazing** in front of the fences. The pig is on the right side of the sheep. The cow is **grazing** on the right side of the pig.

➤ 一些注意事项

- 鸡和鸭可以站在栅栏上，其他动物不会。
- json 文件中会遗漏一些元素（比如上图中的 road），可以忽略之。
- 猫和狗和鸟和人可以 on the bench，狗和猫可以 on the sofa，其他动物不会。
- 动物之间有左右关系先描述左右关系（上下关系只有和鸟、昆虫）。其他上下关系限于物品和环境。剩下基本是 In front of.
- 交通工具具有 running 动作(自行车上没有人所以自行车没动作)。动物按常识分动作 (grazing、running、flying)。静态物品不予以动作。
- 介词不确定的有道翻译要好一些。

➤ 如何做这件事？

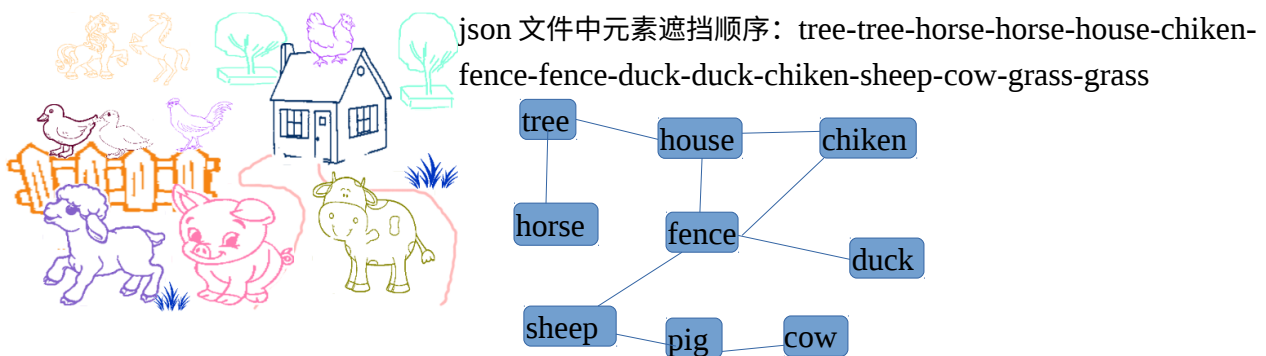
用编程语言（不限语言）读入 json 中标签、坐标、先后关系(zIndex)去实现输出到 txt 关于图的文字描述。

提示：

将元素归类（天气、环境、物品），根据常识来判断动物能不能 grazing，再比如鸟就是 flying in the sky。json 文件的摆放已经很整齐，基本是按顺序描述。

提供一个思路：读入的元素作为 nodes，这些 nodes 存储了元素的信息 category、zIndex 和坐标。根据结点的距离关系可以将其连成 graph，graph 就表达了元素之间的关系。

怎么连成图？



有其他方法也可以，不一定非要用上面提到的方法 graph。

动物之间有左右关系先描述左右关系（上下关系只有和鸟、昆虫）。其他上下关系限于物品和环境。剩下基本是 In front of. 比如 pig 就描述为在 sheep 右边，而不是 fence 前面。sheep 左边没东西，所以就考虑了它在 fence 前面。下一页是 category 列表，环境基本局限于 garden, farm, dinning room, and park，所以每幅图相似点很多。

45 categories(garden, farm, dinning room, and park)

weather

- | | |
|----------|------------------------|
| 1. sun | It's a sunny day. |
| 2. star | It 's a moonlit night. |
| 3. cloud | It's a cloudy day. |
| 4. moon | It 's a starry night. |

Environment

- | | |
|-------------|--|
| 5. mountain | in the distance |
| 6. road | xxx on the road(主要是交通工具) |
| 7. house | in front of the house or on the house or 左右 |
| 8. fence | in front of the fence or on the fence or 左右 |
| 9. bench | under the bench(猫狗可以钻长椅下面) or on the bench(猫狗可以躺椅子上) or 左右 |
| 10. grass | xxx on the grass/grazing |
| 11. flower | xxx on the flowers |

Objects

| Fruit (01) 水果 6 | | | | |
|----------------------|---------------------|--------------------|---------------------|------------------|
| banana (0101) 香蕉🍌 | apple (0102) 苹果🍏 | pear (0103) 梨子🍐 | grape (0104) 葡萄🍇 | pineapple 菠萝🍍 |

| Animal (02) 动物 17 | | | | |
|--------------------|--------------------|--------------------|-----------------------|-----------------------|
| people (0203) 人 | sheep (0214) 羊🐏 | cow (0215) 牛🐮 | rabbit (0204) 小兔子🐰 | bird (0218) 小鸟 |
| dog (0206) 小狗🐶 | cat (0207) 小猫🐱 | horse (0208) 马🐎 | pig (0209) 小猪🐷 | chicken (0212) 小鸡🐔 |

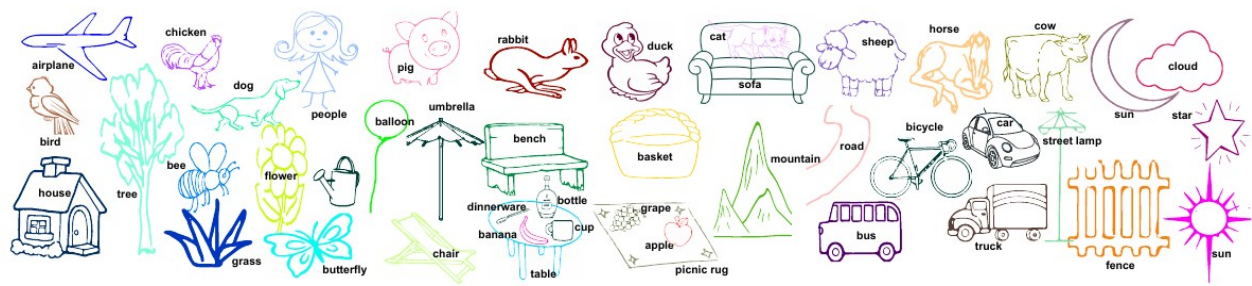
| Plant (03) 植物 5 | | | | |
|-------------------|-------------------|---------------------|--|--|
| grass (0301) 草 | tree (0303) 树🌳 | flower (0304) 花🌸 | | |

| Things in the sky (04) 空中的东西 5 | | | | |
|--------------------------------|--------------------|-----------|-----------------------|---------------|
| butterfly (0401) 蝴蝶 | bee (0402) 小蜜蜂🐝 | bird 鸟 | airplane (0404) 飞机 | balloon 气球 |

| Furniture (05)家具 | | | | |
|------------------|--------------|------------|--------|----------|
| sofa (0501) | chair (0502) | dinnerware | table | cup |
| bottle | picnic_rug | bucket | basket | umbrella |

| 交通工具 | | | | |
|-------|-----|---------|-----|--|
| truck | bus | bicycle | car | |

Grass and flower 作为环境来描述，不作为物品。不管有多少草，统一为 grass，花统一为 flowers。



45 categories