关于图像中的sql文本识别

使用在线网站

Free Online OCR - Image to text and PDF to Doc converter

存在信息安全问题

且效果一般

pytesseract

适用于表结构语句

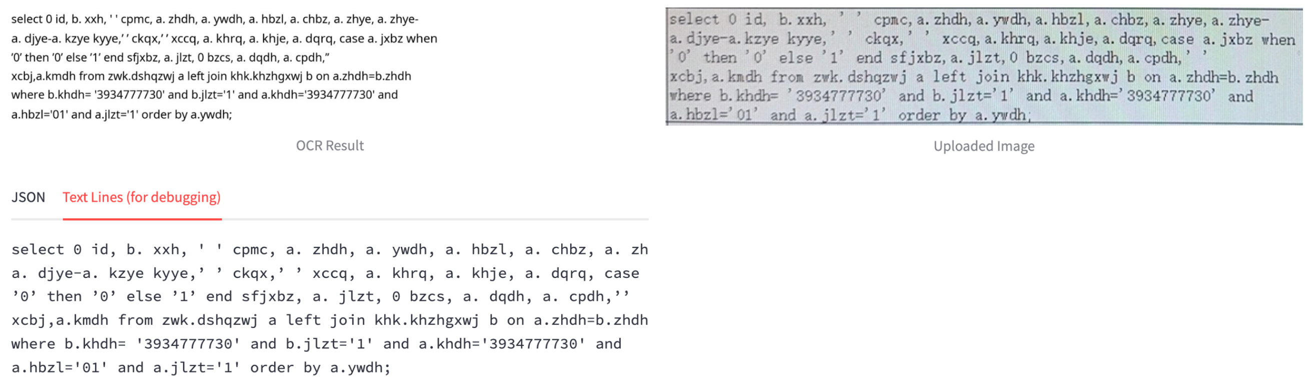
识别之后，做一些易错项目转换

```
import os
import re
from PIL import Image
import pytesseract

# 定义要保留的字符集，包括换行符
allowed_chars = re.compile(r'[a-zA-Z0-9(),;.@\n _=®{}]')

# 定义图片文件夹路径
image_folder = 'xingye'
result_folder = 'xingye/result'
trans_folder = 'xingye/trans'

# 创建文件夹
os.makedirs(result_folder, exist_ok=True)
os.makedirs(trans_folder, exist_ok=True)


# 遍历文件夹中的所有图片文件
for filename in os.listdir(image_folder):
    if filename.lower().endswith(('.png', '.jpg', '.jpeg', '.bmp', '.png')):
        # 构建图片文件的完整路径
        image_path = os.path.join(image_folder, filename)

        # 使用 pytesseract 读取图片中的文本内容
        image = Image.open(image_path)
        content = pytesseract.image_to_string(image)



        # 过滤掉不需要的字符
        filtered_content = ''.join(filter(allowed_chars.match, content))

        # 将 @ 符号转换为 0
        filtered_content = filtered_content.replace('@', '0')

        filtered_content = filtered_content.replace('®', '0')


        # 去掉下划线前后的空格
        filtered_content = re.sub(r'\s*_\s*', '_', filtered_content)
        filtered_content = filtered_content.replace('{', '(')
        filtered_content = filtered_content.replace('}', ')')
        # 将 InnoD8 转换为 InnoDB
        filtered_content = re.sub(r'InnoD8', 'InnoDB', filtered_content)

        # 构建输出文本文件的路径
        output_filename = os.path.splitext(filename)[0] + '.txt'
        output_path = os.path.join(result_folder, output_filename)

        # 过程结果写入输出文件
        trans_path = os.path.join(trans_folder, output_filename)
        with open(trans_path, 'w', encoding='utf-8') as file:
            file.write(content)


        # 将结果写入输出文件
        with open(output_path, 'w', encoding='utf-8') as file:
            file.write(filtered_content)

        print(f"处理完成，结果已写入 {output_path} 文件。")
```

surga--多模态模型

https://github.com/VikParuchuri/surya

适用于sql语句，因为sql语句中的 '',* 等符号不可忽略，使用该模型较好


select 0 id, b. xxh, ' ' cpmc, a. zhdh, a. ywdh, a. hbzl, a. chbz, a. zhye, a. zhye-
a. djye-a. kzye kyye,’ ’ ckqx,’ ’ xccq, a. khrq, a. khje, a. dqrq, case a. jxbz when
’0’ then ’0’ else ’1’ end sfjxbz, a. jlzt, 0 bzcs, a. dqdh, a. cpdh,”
xcbj,a.kmdh from zwk.dshqzwj a left join khk.khzhgxwj b on a.zhdh=b.zhdh
where b.khdh= '3934777730' and b.jlzt='1' and a.khdh='3934777730' and
a.hbzl='01' and a.jlzt='1' order by a.ywdh;

OCR Result

```
select 0 id,  b. xxh,  ’ ’  cpmc, a. zhdh, a. ywdh, a. hbzl, a. chbz, a. zhye, a. zhye-
a. djye-a. kzye kyye,’ ’  ckqx,’ ’  xccq, a. khrq, a. khje, a. dqrq, case  a. jxbz when
’0’  then ’0’  else ’1’  end sfjxbz, a. jlzt, 0 bzcs, a. dqdh, a. cpdh,’ ’
xcbj, a. kmdh from zwk. dshqzwj a left join khk. khzhgxwj b on a. zhdh=b. zhdh
where b. khdh= ’3934777730’  and b. jlzt=’1’  and a. khdh=’3934777730’  and
a. hbzl=’01’  and a. jlzt=’1’  order by a. ywdh;
```

Uploaded Image

```
select 0 id, b. xxh, ' ' cpmc, a. zhdh, a. ywdh, a. hbzl, a. chbz, a. zh
a. djye-a. kzye kyye,’ ’ ckqx,’ ’ xccq, a. khrq, a. khje, a. dqrq, case
’0’ then ’0’ else ’1’ end sfjxbz, a. jlzt, 0 bzcs, a. dqdh, a. cpdh,’’
xcbj,a.kmdh from zwk.dshqzwj a left join khk.khzhgxwj b on a.zhdh=b.zhdh
where b.khdh= '3934777730' and b.jlzt='1' and a.khdh='3934777730' and
a.hbzl='01' and a.jlzt='1' order by a.ywdh;
```

PaddleOCR--模型

https://github.com/PaddlePaddle/PaddleOCR

扫描全能王在线

https://www.camscanner.com/file/recent

识别建表语句优秀，但是涉及数据安全问题

-- 有无开源版本?

文本处理

模仿扫描全能王的处理模式

```
import cv2
import numpy as np

# 读取图片
image = cv2.imread('image_path.jpg', cv2.IMREAD_COLOR)

# 转换为灰度图像
gray = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)

# 应用高斯模糊
blurred = cv2.GaussianBlur(gray, (5, 5), 0)
```

```
# 使用自适应阈值
thresh = cv2.adaptiveThreshold(blurred, 255, cv2.ADAPTIVE_THRESH_GAUSSIAN_C,
cv2.THRESH_BINARY, 11, 2)

# 保存结果
cv2.imwrite('enhanced_image.jpg', thresh)
```

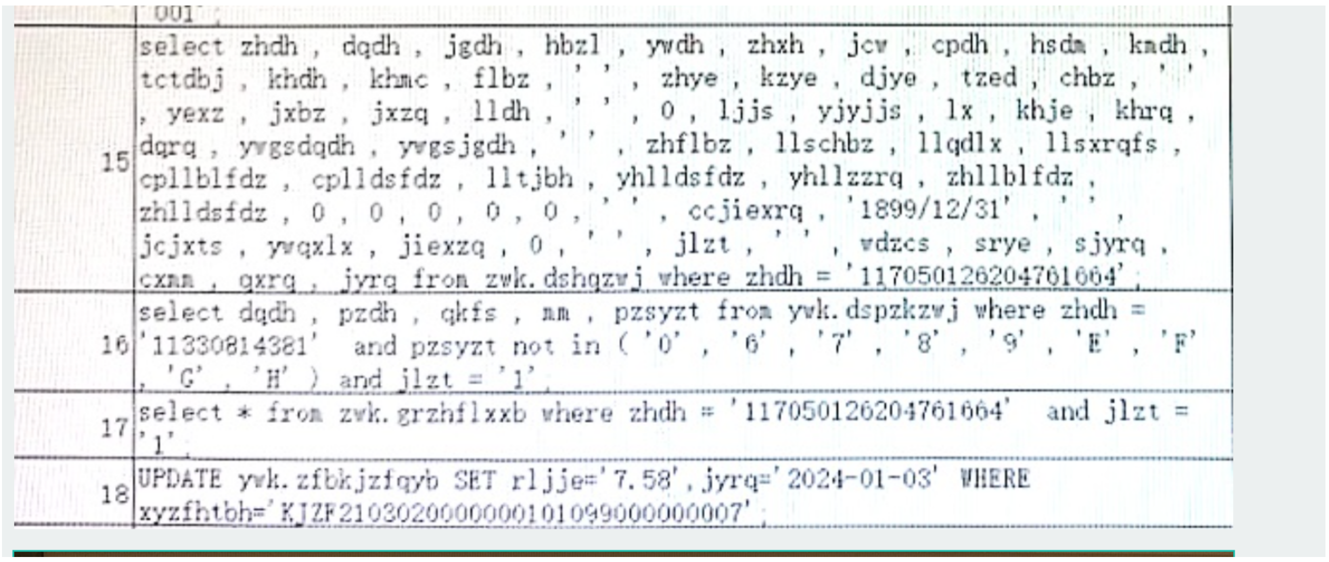
```
from PIL import Image, ImageEnhance, ImageFilter

# 打开图片
image = Image.open('image_path.jpg')

# 增强对比度
enhancer = ImageEnhance.Contrast(image)
image = enhancer.enhance(2)

# 增强锐度
enhancer = ImageEnhance.Sharpness(image)
image = enhancer.enhance(2)

# 保存结果
image.save('enhanced_image.jpg')
```

目前一个可行的方案

1. 切分目标图案

   -- 边界文字识别能力很差，需要人工处理图片

   需要将图中的表格单个截取出来



	'001';
15	select zhdh , dqdh , jgdh , hbzl , ywdh , zhxh , jcw , cpdh , hsdm , kmdh , tctdbj , khdh , khmc , flbz , ' ' , zhye , kzye , djye , tzed , chbz , ' ' , yexz , jxbz , jxzq , lldh , ' ' , 0 , ljjs , yjyjjs , lx , khje , khrq , dqrq , ywgsdqdh , ywgsjgdh , ' ' , zhflbz , llschbz , llqdlx , llsxrqfs , cpllblfdz , cplldsfdz , lltjbh , yhlldsfdz , yhllzzrq , zhllblfdz , zhlldsfdz , 0 , 0 , 0 , 0 , 0 , ' ' , ccjiexrq , '1899/12/31' , ' ' , jcjxts , ywqxlx , jiexzq , 0 , ' ' , jlzt , ' ' , wdzcs , srye , sjyrq , cxmm , gxrq , jyrq from zwk.dshgzwj where zhdh = '11705012620476l664';
16	select dqdh , pzdh , qkfs , mm , pzsyzt from ywk.dspzkzwj where zhdh = '11330814381' and pzsyzt not in ('0' , '6' , '7' , '8' , '9' , 'E' , 'F' , 'G' , 'H') and jlzt = '1';
17	select * from zwk.grzhflxxb where zhdh = '11705012620476l664' and jlzt = '1';
18	UPDATE ywk.zfbkjzfqyb SET rljje='7.58',jyrq='2024-01-03' WHERE xyzfhtbh='KJZF21030200000001010990000000007';

2. 图片处理

   锐化，图像增强

3. 文本识别

   surga--符号识别能力强，但是下划线识别能力很差

   pytesseract--英文符号识别能力强

4. 文本校对

   结合表结构和业务SQL来对比识别的数据

sysbench多线程造数

银河证券的数据量在390W级别，表数量在10个，单线程造数太慢，参考sysbench源码进行多线程造数探索

```
function cmd_prepare()
   local drv = sysbench.sql.driver()
   local con = drv:connect()

   for i = sysbench.tid % sysbench.opt.threads + 1, sysbench.opt.tables,
   sysbench.opt.threads do
     create_table(drv, con, i)
   end
end
```

sysbench思路在于为每个table提前分配好thread，一个thread负责一个table

参照common脚本，将create_table函数中循环构造数据

sysbench的prepare_point_selects和select_random_points的区别

prepare_point_selects 为点差，访问范围为多表多数据. "SELECT c FROM sbtest%u WHERE id=?",

select_random_points为单表某个数据范围

```
SELECT id, k, c, pad
          FROM sbtest1
          WHERE k IN (%s)
```

造数方法

借用AI识别字段，提供生成各种字段的函数generate_random_string，generate_random_datetime，让AI按照字段使用合适的生成函数

```
for i = 1, 3600000 do
         query = string.format([[
        INSERT INTO stk_trdacct_bak (
         cust_code, CUACCT_bak_code, int_org, market, board, trdacct, trdacct_type,
         trdacct_excls, trdacct_name, trdacct_status, treg_status, credit_flag,
         stkpbu, open_date, close_date, update_time
        ) VALUES ('%s', '%s', %d, '%s', '%s', '%s', '%s', '%s', '%s', '%s', '%s', '%s',
'%s', %d, %d, NOW())
        ]], generate_random_string(20), generate_random_string(20), math.random(1, 99999),
generate_random_string(1),
             generate_random_string(2), generate_random_string(20),
generate_random_string(1), generate_random_string(1),
             generate_random_string(32), generate_random_string(1),
generate_random_string(1), generate_random_string(1),
             generate_random_string(8), math.random(20000101, 20230101),
math.random(20000101, 20230101)
         )
         con:query(query)
    end
```