# 物联网技术实验报告

课程名称：物联网技术 实验日期：2018 年 4 月 25 日

姓名：李阅 学号： 21170211058 专业：计算机软件与理论

实验名称：串行通信传感设备数据采集1

一、打印采集程序源代码以及存储数据的文本文件

# coding:utf-8

import serial

import serial.tools.list\_ports

from binascii import a2b\_hex,b2a\_hex

from datetime import datetime

\_\_author\_\_="Octan3"

\_\_email\_\_="octan3@stu.ouc.edu.cn"

def listport():

plist = list(serial.tools.list\_ports.comports())

# print plist

if len(plist) <= 0:

print "Not find port"

else:

plist\_0 = list(plist[0])

serialName = plist\_0[0]

print 'find port!'

print serialName

# serialFd = serial.Serial(serialName, 9600, timeout=60)

# print "可用端口名>>>", serialFd.name

def r2d\_w6000(string):

if not string:

return ""

now = datetime.now().strftime("%Y-%m-%d, %H:%M:%S")

bb = bin(int(string[8], 16))

bb = '0'\*(6-len(bb)) + bb[2:]

wendu = int(string[14:18], 16) / 10.0

shidu = int(string[18:22], 16) / 10.0

ss = "%s %s, %f, %f"%(now, bb, wendu, shidu)

return ss

def r2d\_wt310(string):

if not string:

return ""

now = datetime.now().strftime("%Y-%m-%d, %H:%M:%S")

num = []

for item in string.split(','):

if item:

t = item.split('E')

item = float(t[0]) \* (10 \*\* int(t[1]))

num.append(item)

ss = "%s "%now

for item in num:

ss = ss + "%04.4f;"%item

return ss

class Serii(object):

def \_\_init\_\_(self, com):

# 打开端口

self.port = serial.Serial(port=com, baudrate=9600, bytesize=8, parity='N', stopbits=1, timeout=1)

# 发送指令的完整流程

def send\_cmd(self, cmd, rtype=0):

self.port.write(cmd)

response = self.port.readall()

if rtype:

response = b2a\_hex(response)

return response

# response = self.convert\_hex(response)

# return response

# 转成16进制的函数

def convert\_hex(self, string):

res = []

result = []

for item in string:

res.append(item)

for i in res:

result.append(hex(i))

return result

def S2hex(self, string):

# al = []

# for i in range(len(sxx)/2):

# al.append( chr(int(sxx[i\*2: i\*2+2], 16)) )

# s = ''.join(al)

s = a2b\_hex(string)

return s

def main():

listport()

#连接端口

com = raw\_input("Enter port name(defalut is COM3):")

if not com:

com= 'COM3'

a = Serii(com)

#输入命令

if raw\_input("order encode type:defalut is string, enter x to hex style:") == 'x':

order = raw\_input("Enter order(defalut is query kl-w6000, no space):")

if not order:

order = '010400000004f1c9'

print 'order:', order

order = a2b\_hex(order)

else:

order = raw\_input("Enter order(defalut is query wt310, ! means CR+LF):")

if not order:

order = ':NUMeric:NORMal:VALue?\r\n'

if order[-1]=='!':

order = order[:-1]+'\r\n'

print 'order:', order

#结果格式

rtype = 0 #0string, 1hex

if raw\_input("result encode type:defalut is string, enter x to hex style:") == 'x':

rtype = 1

#循环次数

while True:

ten=raw\_input("Enter a repeat number:")

if ten.isdigit():

ten=int(ten) #或者是ten=eval(ten)

if ten>0:

break

#结果存储文件名

filename = raw\_input("Enter filename(defalut is result.txt):")

if not filename:

filename = "result.txt"

rls = []

for i in range(ten):

r = a.send\_cmd(order, rtype)

print r

# r = r2d\_wt310(r)

r = r2d\_w6000(r)

print r,'\n'

rls.append(r+'\n')

#结果存储

if filename != 'no':

f = open(filename, 'w')

f.writelines(rls)

f.close()

if \_\_name\_\_ == '\_\_main\_\_':

main()

解析后的数据：

2018-05-02, 15:04:53 1001, 6.200000, 51.200000

2018-05-02, 15:04:55 1001, 6.100000, 51.200000

2018-05-02, 15:04:58 1001, 6.100000, 51.200000

2018-05-02, 15:05:00 1001, 6.100000, 51.200000

2018-05-02, 15:05:02 1001, 6.100000, 49.800000

2018-05-02, 15:05:04 1001, 6.100000, 49.800000

2018-05-02, 15:05:06 1001, 6.100000, 49.800000

2018-05-02, 15:05:08 1001, 6.100000, 49.800000

2018-05-02, 15:05:10 1001, 6.100000, 49.800000

2018-05-02, 15:05:12 1001, 6.100000, 49.800000

2018-05-02, 15:05:14 1001, 6.100000, 49.800000

2018-05-02, 15:05:16 1001, 6.000000, 49.800000

2018-05-02, 15:05:18 1001, 6.000000, 49.800000

2018-05-02, 15:05:20 1001, 6.000000, 49.800000

2018-05-02, 15:05:22 1001, 6.000000, 49.800000

2018-05-02, 15:05:24 1001, 6.000000, 49.800000

2018-05-02, 15:05:26 1001, 6.000000, 49.800000

2018-05-02, 15:05:28 1001, 6.000000, 49.800000

2018-05-02, 15:05:30 1001, 6.000000, 49.800000

2018-05-02, 15:05:32 1001, 6.000000, 49.800000

二、总结编写数据采集软件以及软件调试的关键步骤

本程序使用python编写，利用pyserial模块进行串口通信。首先是获取串口，然后配置先关参数，进行串口连接。然后在发送数据。

关键步骤就是串口连接，数据进制转换和数据解析。

三、实验遇到的问题和解决方法

本次实验遇到的问题是如何在没有串口硬件的情况下调试程序。解决办法是使用串口模拟器和串口助手模拟串口通信。

然后一个很难得问题是数据进制转换。本次实验是通过字符串形式发送和接受命令，比较简单，但是如果使用16进制进行数据发送和接受是比较困难的，需要把输入的字符串转换成对应的16进制字节串。解析的时候则正好相反。通过binascii库完成相关操作。

数据解析的时候要把代表16进制数据的字符串转换为二进制的字符串输出是个难点。需要先把16进制的字符串转换为10进制，在转换为二进制的字符串，同时要补足0位。