from PySide2.QtWidgets import QApplication,QComboBox,QGroupBox,QLabel,QLineEdit,QRadioButton,QMessageBox

from PySide2.QtUiTools import QUiLoader

from PySide2.QtGui import QIcon

import math

import os

import xlwt

class Stats:

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

# 从文件中加载UI定义

# 从 UI 定义中动态 创建一个相应的窗口对象

# 注意：里面的控件对象也成为窗口对象的属性了

# 比如 self.ui.button , self.ui.textEdit

self.ui = QUiLoader().load('ui/main.ui')

# 设置控件隐藏

self.ui.label\_8.setVisible(False)

self.ui.label\_10.setVisible(False)

self.ui.label\_12.setVisible(False)

self.ui.label\_17.setVisible(False)

self.ui.label\_24.setVisible(False)

self.ui.label\_28.setVisible(False)

self.ui.label\_38.setVisible(False)

self.ui.label\_43.setVisible(False)

self.ui.label\_44.setVisible(False)

self.ui.lineEdit\_5.setVisible(False)

self.ui.lineEdit\_6.setVisible(False)

self.ui.lineEdit\_7.setVisible(False)

self.ui.lineEdit\_15.setVisible(False)

self.ui.lineEdit\_20.setVisible(False)

self.ui.lineEdit\_25.setVisible(False)

self.ui.lineEdit\_31.setVisible(False)

self.ui.lineEdit\_32.setVisible(False)

self.ui.radioButton\_7.setVisible(False)

self.ui.radioButton\_8.setVisible(False)

self.ui.label\_42.setVisible(False)

self.ui.lineEdit\_39.setVisible(False)

self.ui.label\_55.setVisible(False)

self.ui.label\_56.setVisible(False)

self.ui.label\_57.setVisible(False)

self.ui.lineEdit\_49.setVisible(False)

self.ui.lineEdit\_50.setVisible(False)

self.ui.lineEdit\_51.setVisible(False)

self.ui.lineEdit\_52.setVisible(False)

self.ui.lineEdit\_53.setVisible(False)

self.ui.label\_22.setVisible(False)

self.ui.label\_58.setVisible(False)

#设置信号

self.ui.comboBox.currentIndexChanged.connect(self.maiDi)

self.ui.comboBox\_2.currentIndexChanged.connect(self.neiChen)

self.ui.comboBox\_3.currentIndexChanged.connect(self.queXian)

self.ui.buttonGroup.buttonClicked.connect(self.cheLiang)

self.ui.pushButton.clicked.connect(self.heZai)

self.ui.pushButton\_2.clicked.connect(self.houDu)

self.ui.pushButton\_3.clicked.connect(self.shengYu)

self.ui.pushButton\_4.clicked.connect(self.jiYongLiang)

self.ui.pushButton\_5.clicked.connect(self.daoChu)

self.ui.buttonGroup\_2.buttonClicked.connect(self.lieWen)

#判断埋地方式

def maiDi(self):

maidi = self.ui.comboBox.currentText()

if maidi == "沟埋式管道":

self.ui.label\_10.setVisible(False)

self.ui.label\_12.setVisible(False)

self.ui.lineEdit\_7.setVisible(False)

self.ui.lineEdit\_15.setVisible(False)

else:

self.ui.label\_10.setVisible(True)

self.ui.label\_12.setVisible(True)

self.ui.lineEdit\_7.setVisible(True)

self.ui.lineEdit\_15.setVisible(True)

#判断车辆情况

def cheLiang(self):

if self.ui.buttonGroup.checkedButton().text() == "两轮":

self.ui.label\_24.setVisible(True)

self.ui.label\_28.setVisible(True)

self.ui.lineEdit\_20.setVisible(True)

self.ui.lineEdit\_25.setVisible(True)

else:

self.ui.label\_24.setVisible(False)

self.ui.label\_28.setVisible(False)

self.ui.lineEdit\_20.setVisible(False)

self.ui.lineEdit\_25.setVisible(False)

#计算总荷载

def heZai(self):

#获取参数值

goucaokuan = float(self.ui.lineEdit\_19.text())

rongzhong = float(self.ui.lineEdit\_17.text())

tushen = float(self.ui.lineEdit\_16.text())

tianjiao = float(self.ui.lineEdit\_18.text())

cejiao = float(self.ui.lineEdit\_9.text())

guanjing = float(self.ui.lineEdit\_10.text())

shuishen = float(self.ui.lineEdit\_13.text())

danya = float(self.ui.lineEdit\_21.text())

chechang = float(self.ui.lineEdit\_23.text())

chekuan = float(self.ui.lineEdit\_22.text())

dongli = float(self.ui.lineEdit\_24.text())

zhenkong = float(self.ui.lineEdit\_3.text())

#根据埋地方式选择土压力计算方法

if self.ui.comboBox.currentText() == "沟埋式管道":

k =(math.tan((45-tianjiao/2)/180\*math.pi))\*\*2

f = math.tan(cejiao/180\*math.pi)

tu\_1 = rongzhong\*goucaokuan\*goucaokuan/(2\*k\*f)\*(1-math.e\*\*(-2\*k\*f\*tushen/goucaokuan))/1000

b = guanjing\*(1+math.tan((45-cejiao/2)/180\*math.pi))

c = (1-math.e\*\*(-2\*0.9\*tushen/b))/1.8

tu\_2 = c\*b\*rongzhong\*guanjing/1000

tuyali = max(tu\_1,tu\_2)

else:

dengchen = float(self.ui.lineEdit\_15.text())

nianju = float(self.ui.lineEdit\_7.text())

if tushen <= dengchen:

tu\_1 = (rongzhong\*guanjing\*guanjing/(2\*(math.tan(cejiao/180\*math.pi))\*((math.tan((45-tianjiao/2)/180\*math.pi))\*\*2)))\*(math.e\*\*(2\*(math.tan(cejiao/180\*math.pi))\*((math.tan((45-tianjiao/2)/180\*math.pi))\*\*2)\*tushen/guanjing)-1)/1000

tu\_2 = rongzhong\*tushen\*guanjing + rongzhong\*tushen\*tushen\*(math.tan(cejiao/180\*math.pi))\*((math.tan((45-tianjiao/2)/180\*math.pi))\*\*2) + 2\*nianju\*(1-2\*math.sqrt(math.tan(cejiao/180\*math.pi))\*((math.tan((45-tianjiao/2)/180\*math.pi))\*\*2))\*tushen/1000

tu\_3 =(guanjing\*(1+math.tan((45-cejiao/2)/180\*math.pi)))\*rongzhong\*guanjing\*(1-math.e\*\*(-2\*0.9\*tushen/(guanjing\*(1+math.tan((45-cejiao/2)/180\*math.pi)))))/1800

tuyali = max(tu\_1,tu\_2,tu\_3)

else:

tu\_1 = (rongzhong\*guanjing\*guanjing/(2\*(math.tan(cejiao/180\*math.pi))\*((math.tan((45-tianjiao/2)/180\*math.pi))\*\*2)))(math.e\*\*((2\*(math.tan(cejiao/180\*math.pi))\*((math.tan((45-tianjiao/2)/180\*math.pi))\*\*2))\*tushen/guanjing)-1)+rongzhong\*guanjing\*(tushen-dengchen)\*(math.e\*\*(2\*(math.tan(cejiao/180\*math.pi))\*((math.tan((45-tianjiao/2)/180\*math.pi))\*\*2)\*dengchen/guanjing))

tu\_2 = rongzhong\*tushen\*guanjing+rongzhong\*(2\*tushen-dengchen)\*dengchen\*(math.tan(cejiao/180\*math.pi))\*((math.tan((45-tianjiao/2)/180\*math.pi))\*\*2)+ 2\*nianju\*(1-2\*math.sqrt(math.tan(cejiao/180\*math.pi))\*((math.tan((45-tianjiao/2)/180\*math.pi))\*\*2))\*dengchen

tu\_3 =(guanjing\*(1+math.tan((45-cejiao/2)/180\*math.pi)))\*rongzhong\*guanjing\*(1-math.e\*\*(-2\*0.9\*tushen/(guanjing\*(1+math.tan((45-cejiao/2)/180\*math.pi)))))/1.8

tuyali = max(tu\_1,tu\_2,tu\_3)

#计算静液压力

jingye = 0.00981\*shuishen

# 计算活荷载

if self.ui.buttonGroup.checkedButton().text() == "单轮":

cheya = (danya \* dongli)/((chechang+1.4\*tushen)\*(chekuan+1.4\*tushen))/1000

else:

zongliang = float(self.ui.lineEdit\_25.text())

jingju = float(self.ui.lineEdit\_20.text())

cheya = (danya\*dongli\*zongliang)/((chechang+1.4\*tushen)\*(zongliang\*chekuan+(zongliang-1)\*jingju+1.4\*tushen))/1000

zongyali = tuyali + jingye +cheya + zhenkong + 0.01

self.ui.lineEdit\_34.setText(str(zongyali))

#修复设计方式选择

def neiChen(self):

if self.ui.comboBox\_2.currentText() == "结构性修复设计":

self.ui.label\_8.setVisible(True)

self.ui.label\_17.setVisible(True)

self.ui.lineEdit\_5.setVisible(True)

self.ui.lineEdit\_6.setVisible(True)

else:

self.ui.label\_8.setVisible(False)

self.ui.label\_17.setVisible(False)

self.ui.lineEdit\_5.setVisible(False)

self.ui.lineEdit\_6.setVisible(False)

#内衬壁厚设计

def houDu(self):

neijing = float(self.ui.lineEdit.text())

changqi = float(self.ui.lineEdit\_8.text())

if self.ui.comboBox\_2.currentText() == "半结构性修复设计":

bosong = float(self.ui.lineEdit\_4.text())

zhenkong = float(self.ui.lineEdit\_3.text())

shuishen = float(self.ui.lineEdit\_13.text())

zuixiao = neijing/((14\*changqi/(zhenkong+shuishen\*0.0981)\*2\*(1-bosong\*\*2))\*\*(1/3)+1)

self.ui.lineEdit\_37.setText(str(zuixiao))

else:

duanqi = float(self.ui.lineEdit\_6.text())

zonghe = float(self.ui.lineEdit\_5.text())

qt = float(self.ui.lineEdit\_34.text())

rw = 1-0.33\*float(self.ui.lineEdit\_13.text())/float(self.ui.lineEdit\_16.text())

bb = 1/(1+4\*math.e\*\*(-0.213\*float(self.ui.lineEdit\_16.text())))

zuixiao = 0.721\*neijing\*(4\*qt\*qt/(changqi\*rw\*bb\*zonghe))\*\*(1/3)

# zuixiao = 0.721\*neijing\*(((2\*float(self.ui.lineEdit\_34.text()))\*\*2)/(changqi\*(1-0.33\*float(self.ui.lineEdit\_13.text())/float(self.ui.lineEdit\_16.text()))\*zonghe\*(1/(1+4\*math.e\*\*(-0.213\*float(self.ui.lineEdit\_16.text()))))))\*\*(1/3)

if zuixiao >= (0.1970\*neijing/(duanqi)\*\*(1/3)):

self.ui.lineEdit\_37.setText(str(zuixiao))

else:

self.ui.lineEdit\_37.setText("最小壁厚不符合要求！")

#计算涂料用量

def jiYongLiang(self):

neijing = float(self.ui.lineEdit.text())

changdu = float(self.ui.lineEdit\_2.text())

bihou = float(self.ui.lineEdit\_35.text())

yongliang = changdu \* (math.pi\*neijing\*neijing-math.pi\*(neijing-bihou)\*\*2)/1000000

self.ui.lineEdit\_38.setText(str(yongliang))

#缺陷判断

def queXian(self):

if self.ui.comboBox\_3.currentText() == "腐蚀缺陷":

self.ui.label\_38.setVisible(False)

self.ui.label\_43.setVisible(False)

self.ui.label\_44.setVisible(False)

self.ui.radioButton\_7.setVisible(False)

self.ui.radioButton\_8.setVisible(False)

self.ui.lineEdit\_31.setVisible(False)

self.ui.lineEdit\_32.setVisible(False)

self.ui.label\_37.setVisible(True)

self.ui.label\_32.setVisible(True)

self.ui.label\_33.setVisible(True)

self.ui.label.setVisible(True)

self.ui.label\_45.setVisible(True)

self.ui.label\_31.setVisible(True)

self.ui.lineEdit\_28.setVisible(True)

self.ui.lineEdit\_29.setVisible(True)

self.ui.lineEdit\_33.setVisible(True)

self.ui.lineEdit\_27.setVisible(True)

self.ui.lineEdit\_36.setVisible(True)

self.ui.lineEdit\_11.setVisible(True)

self.ui.lineEdit\_39.setVisible(False)

self.ui.lineEdit\_26.setVisible(True)

self.ui.lineEdit\_30.setVisible(True)

self.ui.label\_42.setVisible(False)

self.ui.label\_34.setVisible(True)

self.ui.label\_46.setVisible(True)

self.ui.label\_55.setVisible(False)

self.ui.label\_56.setVisible(False)

self.ui.label\_57.setVisible(False)

self.ui.lineEdit\_49.setVisible(False)

self.ui.lineEdit\_50.setVisible(False)

self.ui.lineEdit\_51.setVisible(False)

self.ui.label\_49.setVisible(True)

self.ui.label\_50.setVisible(True)

self.ui.label\_51.setVisible(True)

self.ui.label\_52.setVisible(True)

self.ui.label\_53.setVisible(True)

self.ui.label\_54.setVisible(True)

self.ui.lineEdit\_43.setVisible(True)

self.ui.lineEdit\_44.setVisible(True)

self.ui.lineEdit\_45.setVisible(True)

self.ui.lineEdit\_46.setVisible(True)

self.ui.lineEdit\_47.setVisible(True)

self.ui.lineEdit\_48.setVisible(True)

self.ui.lineEdit\_52.setVisible(False)

self.ui.lineEdit\_53.setVisible(False)

self.ui.label\_22.setVisible(False)

self.ui.label\_58.setVisible(False)

else:

self.ui.label\_38.setVisible(True)

self.ui.radioButton\_7.setVisible(True)

self.ui.radioButton\_8.setVisible(True)

self.ui.label\_37.setVisible(False)

self.ui.label\_32.setVisible(False)

self.ui.label\_33.setVisible(False)

self.ui.label.setVisible(False)

self.ui.label\_45.setVisible(False)

self.ui.label\_31.setVisible(False)

self.ui.lineEdit\_28.setVisible(False)

self.ui.lineEdit\_29.setVisible(False)

self.ui.lineEdit\_33.setVisible(False)

self.ui.lineEdit\_27.setVisible(False)

self.ui.lineEdit\_36.setVisible(False)

self.ui.lineEdit\_11.setVisible(False)

self.ui.lineEdit\_39.setVisible(True)

self.ui.lineEdit\_26.setVisible(False)

self.ui.lineEdit\_30.setVisible(False)

self.ui.label\_42.setVisible(True)

self.ui.label\_34.setVisible(False)

self.ui.label\_46.setVisible(False)

self.ui.label\_55.setVisible(True)

self.ui.label\_56.setVisible(True)

self.ui.label\_57.setVisible(True)

self.ui.lineEdit\_49.setVisible(True)

self.ui.lineEdit\_50.setVisible(True)

self.ui.lineEdit\_51.setVisible(True)

self.ui.lineEdit\_43.setVisible(False)

self.ui.lineEdit\_44.setVisible(False)

self.ui.lineEdit\_45.setVisible(False)

self.ui.lineEdit\_46.setVisible(False)

self.ui.lineEdit\_47.setVisible(False)

self.ui.lineEdit\_48.setVisible(False)

self.ui.label\_49.setVisible(False)

self.ui.label\_50.setVisible(False)

self.ui.label\_51.setVisible(False)

self.ui.label\_52.setVisible(False)

self.ui.label\_53.setVisible(False)

self.ui.label\_54.setVisible(False)

self.ui.lineEdit\_52.setVisible(True)

self.ui.lineEdit\_53.setVisible(True)

self.ui.label\_22.setVisible(True)

self.ui.label\_58.setVisible(True)

if self.ui.buttonGroup\_2.checkedButton().text() == "轴向裂纹":

self.ui.label\_44.setVisible(False)

self.ui.lineEdit\_32.setVisible(False)

self.ui.label\_43.setVisible(True)

self.ui.lineEdit\_31.setVisible(True)

else:

self.ui.label\_44.setVisible(True)

self.ui.lineEdit\_32.setVisible(True)

self.ui.label\_43.setVisible(False)

self.ui.lineEdit\_31.setVisible(False)

#旧管道剩余承载力计算

def shengYu(self):

#腐蚀缺陷管道

if self.ui.comboBox\_3.currentText() == "腐蚀缺陷":

guanhou = float(self.ui.lineEdit\_12.text())

qufu = float(self.ui.lineEdit\_14.text())

quechang = float(self.ui.lineEdit\_29.text())

zhouhe = float(self.ui.lineEdit\_33.text())

huankang = float(self.ui.lineEdit\_28.text())

huanying = float(self.ui.lineEdit\_27.text())

neimo = float(self.ui.lineEdit\_36.text())

junyun = float(self.ui.lineEdit\_11.text())

#旧管道轴向应力计算

# jiuzhouxiang = (1\*float(self.ui.lineEdit.text())/(4\*junyun))\*(huankang\*2\*guanhou/(float(self.ui.lineEdit\_10.text())-guanhou))+(float(self.ui.lineEdit\_4.text())\*zhouhe/(math.pi\*float(self.ui.lineEdit.text())\*junyun))\*1000

p = float(self.ui.lineEdit\_28.text())\*2\*float(self.ui.lineEdit\_12.text())/(float(self.ui.lineEdit.text()))

jiuzhouxiang= p\*float(self.ui.lineEdit.text())/4/float(self.ui.lineEdit\_11.text())+(float(self.ui.lineEdit\_4.text())\*float(self.ui.lineEdit\_33.text())/math.pi/float(self.ui.lineEdit.text())/float(self.ui.lineEdit\_11.text()))\*1000

print(p)

print(jiuzhouxiang)

#旧管道环向应力计算

if quechang\*quechang <= 50\*float(self.ui.lineEdit.text())\*guanhou:

m = (1+(0.6275\*quechang\*quechang/(float(self.ui.lineEdit.text())\*guanhou))+(0.003375\*quechang\*\*4/(float(self.ui.lineEdit.text())\*guanhou)/(float(self.ui.lineEdit.text())\*guanhou)))\*\*0.5

else:

m = 0.032\*quechang\*quechang/(float(self.ui.lineEdit.text())\*guanhou)+3.3

jiuhuanxiang = (qufu+68.95)\*((1-0.85\*junyun/guanhou)/(1-0.85\*junyun/guanhou\*m\*\*(-1)))/2

self.ui.lineEdit\_26.setText(str(jiuzhouxiang))

self.ui.lineEdit\_30.setText(str(jiuhuanxiang))

self.ui.lineEdit\_43.setText(str(jiuzhouxiang))

self.ui.lineEdit\_44.setText(str(jiuhuanxiang))

#内衬轴向应力计算

neizhouxiang = 1000\*float(self.ui.lineEdit\_34.text())\*float(self.ui.lineEdit\_2.text())\*8000\*float(self.ui.lineEdit.text())/(math.pi\*(float(self.ui.lineEdit.text())\*\*4-(float(self.ui.lineEdit.text())-2\*float(self.ui.lineEdit\_35.text()))\*\*4))

#内衬环向应力计算

neihuanxiang = neimo\*huanying/1.5

self.ui.lineEdit\_46.setText(str(neizhouxiang))

self.ui.lineEdit\_45.setText(str(neihuanxiang))

#复合管道轴向应力计算

zhouxiang = jiuzhouxiang + neizhouxiang

#复合管道环向应力计算

huanxiang = jiuhuanxiang + neihuanxiang

self.ui.lineEdit\_48.setText(str(zhouxiang))

self.ui.lineEdit\_47.setText(str(huanxiang))

#裂纹缺陷管道

else:

#轴向裂纹计算

if self.ui.buttonGroup\_2.checkedButton().text() == "轴向裂纹":

banchang = float(self.ui.lineEdit\_31.text())

yinzi = banchang/(math.sqrt(1000\*float(self.ui.lineEdit\_10.text())\*float(self.ui.lineEdit\_12.text())))

#Folias模型

frou\_1 = 1/(math.sqrt(1+1.05\*yinzi\*yinzi))

#Erdogan模型

frou\_2 = 1/(0.614+0.87542\*yinzi+0.386\*math.e\*\*(-2.275\*yinzi))

frou = min(frou\_1,frou\_2)

jiujixian = float(self.ui.lineEdit\_53.text())\*float(self.ui.lineEdit\_53.text())\*frou

#环向裂纹计算

else:

jiaodu = float(self.ui.lineEdit\_32.text())

#kanninen模型

jiujixian = 4\*float(self.ui.lineEdit\_52.text())\*float(self.ui.lineEdit\_53.text())\*(math.pi-jiaodu/180\*math.pi+2/(math.sin(math.sin(jiaodu/180\*math.pi)/2)))/math.pi

self.ui.lineEdit\_49.setText(str(jiujixian))

self.ui.lineEdit\_38.setText(str(jiujixian))

#内衬管极限承载力计算

neijixian = float(self.ui.lineEdit\_14.text())\*float(self.ui.lineEdit\_35.text())/(float(self.ui.lineEdit\_4.text())\*(float(self.ui.lineEdit.text())-2\*float(self.ui.lineEdit\_35.text())))

self.ui.lineEdit\_50.setText(str(neijixian))

#复合管道承载力计算

jixian = neijixian + jiujixian

self.ui.lineEdit\_51.setText(str(jixian))

self.ui.lineEdit\_40.setText(self.ui.lineEdit\_34.text())

self.ui.lineEdit\_41.setText(self.ui.lineEdit\_35.text())

self.ui.lineEdit\_42.setText(self.ui.lineEdit\_38.text())

#裂纹控件隐藏

def lieWen(self):

if self.ui.buttonGroup\_2.checkedButton().text() == "轴向裂纹":

self.ui.label\_44.setVisible(False)

self.ui.lineEdit\_32.setVisible(False)

self.ui.label\_43.setVisible(True)

self.ui.lineEdit\_31.setVisible(True)

else:

self.ui.label\_44.setVisible(True)

self.ui.lineEdit\_32.setVisible(True)

self.ui.label\_43.setVisible(False)

self.ui.lineEdit\_31.setVisible(False)

def daoChu(self):

#文件导出

ws = xlwt.Workbook(encoding='utf8')

worksheet = ws.add\_sheet('排水管道喷涂修复承载性研究')

worksheet.write(0,0,"竖向总荷载(MPa)")

worksheet.write(0,1,"内衬壁厚取值(mm)")

worksheet.write(0,2,"涂料用量(m³)")

worksheet.write(1,0,self.ui.lineEdit\_40.text())

worksheet.write(1,1,self.ui.lineEdit\_41.text())

worksheet.write(1,2,self.ui.lineEdit\_42.text())

if self.ui.comboBox\_3.currentText() == "腐蚀缺陷":

worksheet.write(0,3,"旧管道轴向应力(MPa)")

worksheet.write(0,4,"旧管道环向应力(MPa)")

worksheet.write(0,5,"内衬管轴向应力(MPa)")

worksheet.write(0,6,"内衬管环向应力(MPa)")

worksheet.write(0,7,"复合管轴向应力(MPa)")

worksheet.write(0,8,"复合管环向应力(MPa)")

worksheet.write(1,3,self.ui.lineEdit\_43.text())

worksheet.write(1,4,self.ui.lineEdit\_44.text())

worksheet.write(1,5,self.ui.lineEdit\_46.text())

worksheet.write(1,6,self.ui.lineEdit\_45.text())

worksheet.write(1,7,self.ui.lineEdit\_48.text())

worksheet.write(1,8,self.ui.lineEdit\_47.text())

else:

worksheet.write(0,3,"旧管道极限承载力(MPa)")

worksheet.write(0,4,"内衬管极限承载力(MPa)")

worksheet.write(0,5,"复合管极限承载力(MPa)")

worksheet.write(1,3,self.ui.lineEdit\_49.text())

worksheet.write(1,4,self.ui.lineEdit\_50.text())

worksheet.write(1,5,self.ui.lineEdit\_51.text())

#检测文件是否存在

e\_file = os.path.exists('承载力.xls')

if e\_file:

os.remove(r'承载力.xls')

#保存文件

ws.save('承载力.xls')

app = QApplication([])

app.setWindowIcon(QIcon('ui/logo.png'))

stats = Stats()

stats.ui.show()

app.exec\_()