

2022년 IoT기반 스마트 솔루션 개발자 양성과정



Programming : Python

4-PyQt5

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PyQt5



- Cross-platform GUI toolkit **Qt** 의 Python binding Program
- Developer : Riverbank Computing
- Free Software
- PyQt implements around 440 classes and over 6,000 functions and methods including
 - a substantial set of GUI widgets
 - classes for accessing SQL databases (ODBC, MySQL, PostgreSQL, Oracle, SQLite)
 - QScintilla, Scintilla-based rich text editor widget
 - data aware widgets that are automatically populated from a database
 - an XML parser
 - SVG support
 - classes for embedding ActiveX controls on Windows (**only in commercial version**)



sudo apt-get install python3-pyqt5

```
pi@raspberrypi: ~  
File Edit Tabs Help  
pi@raspberrypi:~$ sudo apt-get install python3-pyqt5  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following package was automatically installed and is no longer required:  
  libfuse2  
Use 'sudo apt autoremove' to remove it.  
The following additional packages will be installed:  
  libqt5designer5 libqt5help5 libqt5test5 python3-pyqt5.sip  
Suggested packages:  
  python3-pyqt5-dbg  
The following NEW packages will be installed:  
  libqt5designer5 libqt5help5 libqt5test5 python3-pyqt5 python3-pyqt5.sip  
0 upgraded, 5 newly installed, 0 to remove and 81 not upgraded.  
Need to get 4,904 kB of archives.  
After this operation, 20.5 MB of additional disk space will be used.  
Do you want to continue? [Y/n] y  
Get:1 http://ftp.harukasan.org/raspbian/raspbian bullseye/main armhf libqt5designer5 armhf 5.15.2-5 [2,617 kB]  
Get:2 http://ftp.harukasan.org/raspbian/raspbian bullseye/main armhf libqt5help5 armhf 5.15.2-5 [132 kB]  
Get:3 http://raspbian.raspberrypi.org/raspbian bullseye/main armhf libqt5test5 armhf 5.15.2+dfsg-9+rpil [157 kB]  
Get:4 http://raspbian.raspberrypi.org/raspbian bullseye/main armhf python3-pyqt5.sip armhf 12.8.1-1+b1 [44.2 kB]  
Get:5 http://raspbian.raspberrypi.org/raspbian bullseye/main armhf python3-pyqt5 armhf 5.15.2+dfsg-3 [1,954 kB]  
Fetched 4,904 kB in 4s (1,099 kB/s)  
Selecting previously unselected package libqt5designer5:armhf.  
(Reading database ... 121801 files and directories currently installed.)  
Preparing to unpack .../libqt5designer5_5.15.2-5_armhf.deb ...  
Unpacking libqt5designer5:armhf (5.15.2-5) ...  
Selecting previously unselected package libqt5help5:armhf.  
Preparing to unpack .../libqt5help5_5.15.2-5_armhf.deb ...  
Unpacking libqt5help5:armhf (5.15.2-5) ...  
Selecting previously unselected package libqt5test5:armhf.  
Preparing to unpack .../libqt5test5_5.15.2+dfsg-9+rpil_armhf.deb ...  
Unpacking libqt5test5:armhf (5.15.2+dfsg-9+rpil) ...  
Selecting previously unselected package python3-pyqt5.sip.  
Preparing to unpack .../python3-pyqt5.sip_12.8.1-1+b1_armhf.deb ...  
Unpacking python3-pyqt5.sip (12.8.1-1+b1) ...  
Selecting previously unselected package python3-pyqt5.  
Preparing to unpack .../python3-pyqt5_5.15.2+dfsg-3_armhf.deb ...  
Unpacking python3-pyqt5 (5.15.2+dfsg-3) ...  
Setting up libqt5designer5:armhf (5.15.2-5) ...  
Setting up libqt5help5:armhf (5.15.2-5) ...  
Setting up python3-pyqt5.sip (12.8.1-1+b1) ...  
Setting up libqt5test5:armhf (5.15.2+dfsg-9+rpil) ...  
Setting up python3-pyqt5 (5.15.2+dfsg-3) ...  
Processing triggers for libc-bin (2.31-13+rpt2+rpil+deb11u2) ...  
pi@raspberrypi:~$
```



sudo apt-get install qttools5-dev-tools

```
pi@raspberrypi: ~  
File Edit Tabs Help  
pi@raspberrypi:~ $ sudo apt-get install qttools5-dev-tools  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
The following additional packages will be installed:  
  geoclue-2.0 iio-sensor-proxy libclang1-7 libllvm7 libmbim-glib4  
  libmbim-proxy libmm-glib0 libqmi-glib5 libqmi-proxy  
  libqt5designercomponents5 libqt5positioning5 libqt5qml5 libqt5quick5  
  libqt5quickwidgets5 libqt5sensors5 libqt5webchannel5 libqt5webkit5  
  modemmanager qdoc-qt5 qt5-assistant qtchooser  
Suggested packages:  
  qt5-qmltooling-plugins qt5-doc  
The following NEW packages will be installed:  
  geoclue-2.0 iio-sensor-proxy libclang1-7 libllvm7 libmbim-glib4  
  libmbim-proxy libmm-glib0 libqmi-glib5 libqmi-proxy  
  libqt5designercomponents5 libqt5positioning5 libqt5qml5 libqt5quick5  
  libqt5quickwidgets5 libqt5sensors5 libqt5webchannel5 libqt5webkit5  
  modemmanager qdoc-qt5 qt5-assistant qtchooser qttools5-dev-tools  
0 upgraded, 22 newly installed, 0 to remove and 351 not upgraded.  
Need to get 32.8 MB of archives.  
After this operation, 136 MB of additional disk space will be used.  
Do you want to continue? [Y/n] y  
Get:1 http://ftp.harukasan.org/raspbian/raspbian buster/main armhf libqt5positioning5 armhf 5.11.3+dfsg-2 [159 kB]  
Get:2 http://ftp.harukasan.org/raspbian/raspbian buster/main armhf libqt5qml5 armhf 5.11.3-4 [1,001 kB]  
Get:3 http://ftp.harukasan.org/raspbian/raspbian buster/main armhf libqt5quick5 armhf 5.11.3-4 [1,049 kB]
```

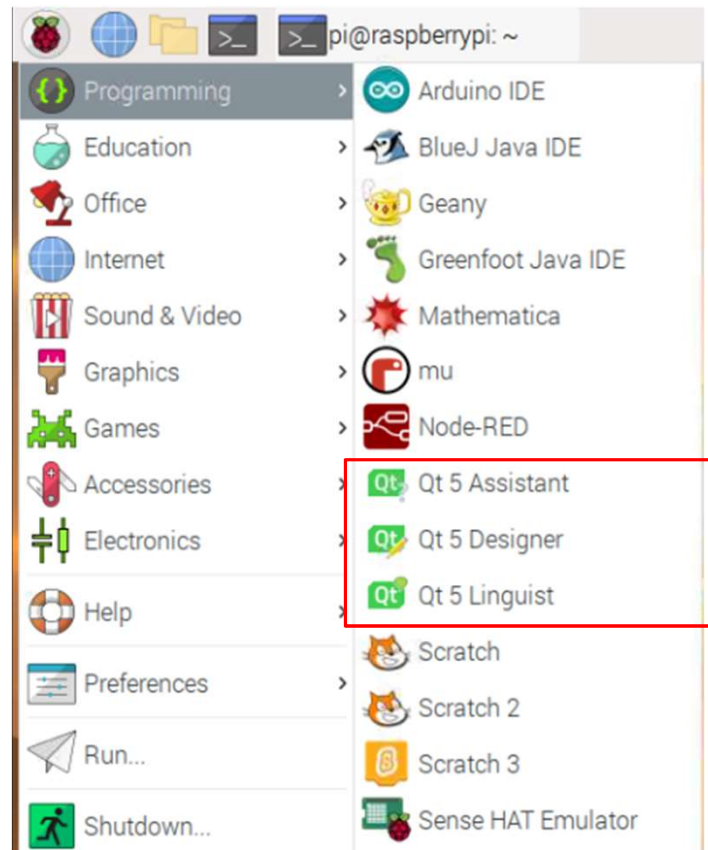


sudo apt install pyqt5-dev-tools

```
pi@raspberrypi: ~  
File Edit Tabs Help  
pi@raspberrypi:~ $ sudo apt install pyqt5-dev-tools  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
The following NEW packages will be installed:  
  pyqt5-dev-tools  
0 upgraded, 1 newly installed, 0 to remove and 351 not upgraded.  
Need to get 169 kB of archives.  
After this operation, 494 kB of additional disk space will be used.  
Get:1 http://ftp.harukasan.org/raspbian/raspbian buster/main armhf pyqt5-dev-too  
ls armhf 5.11.3+dfsg-1+rpil+b3 [169 kB]  
Fetched 169 kB in 2s (104 kB/s)  
Selecting previously unselected package pyqt5-dev-tools.  
(Reading database ... 161789 files and directories currently installed.)  
Preparing to unpack .../pyqt5-dev-tools_5.11.3+dfsg-1+rpil+b3_armhf.deb ...  
Unpacking pyqt5-dev-tools (5.11.3+dfsg-1+rpil+b3) ...  
Setting up pyqt5-dev-tools (5.11.3+dfsg-1+rpil+b3) ...  
Processing triggers for man-db (2.8.5-2) ...  
pi@raspberrypi:~ $
```

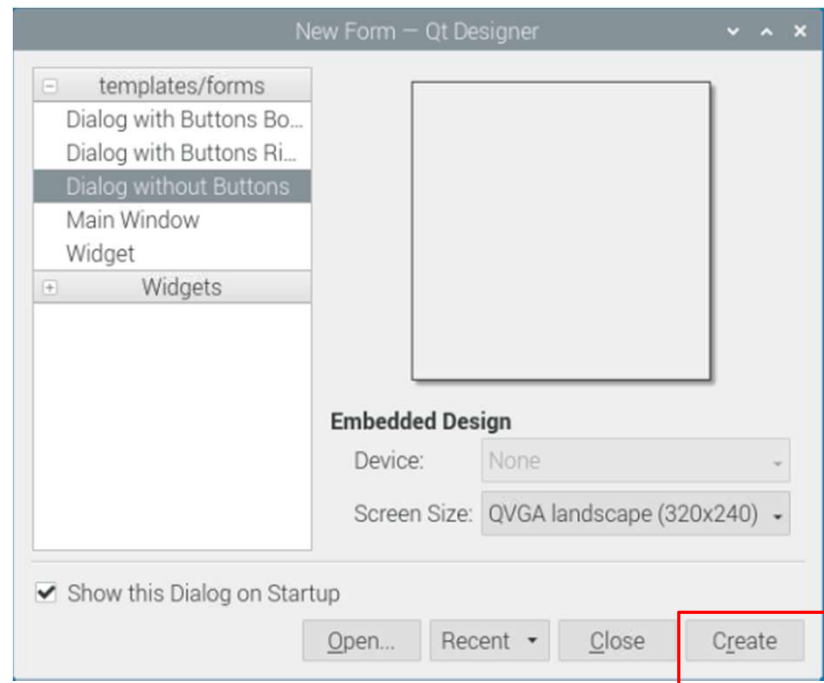


Menu

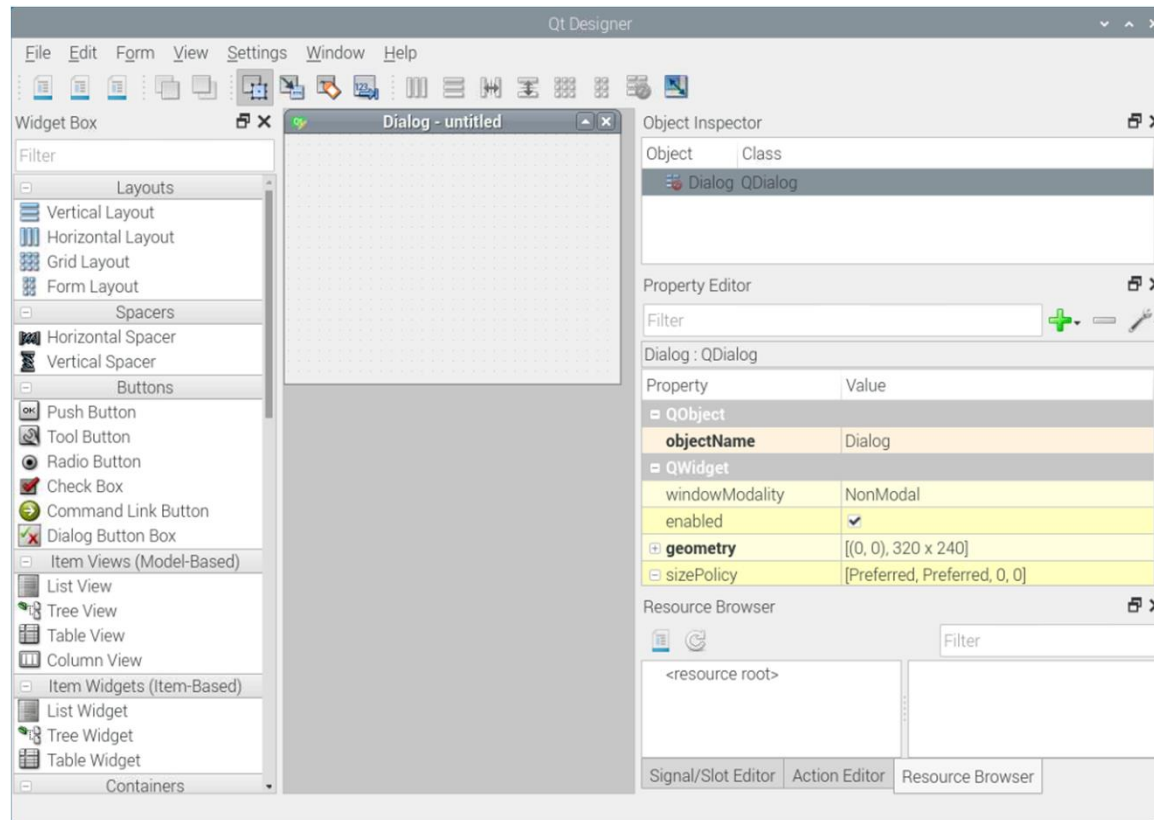


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New Form – Qt Designer

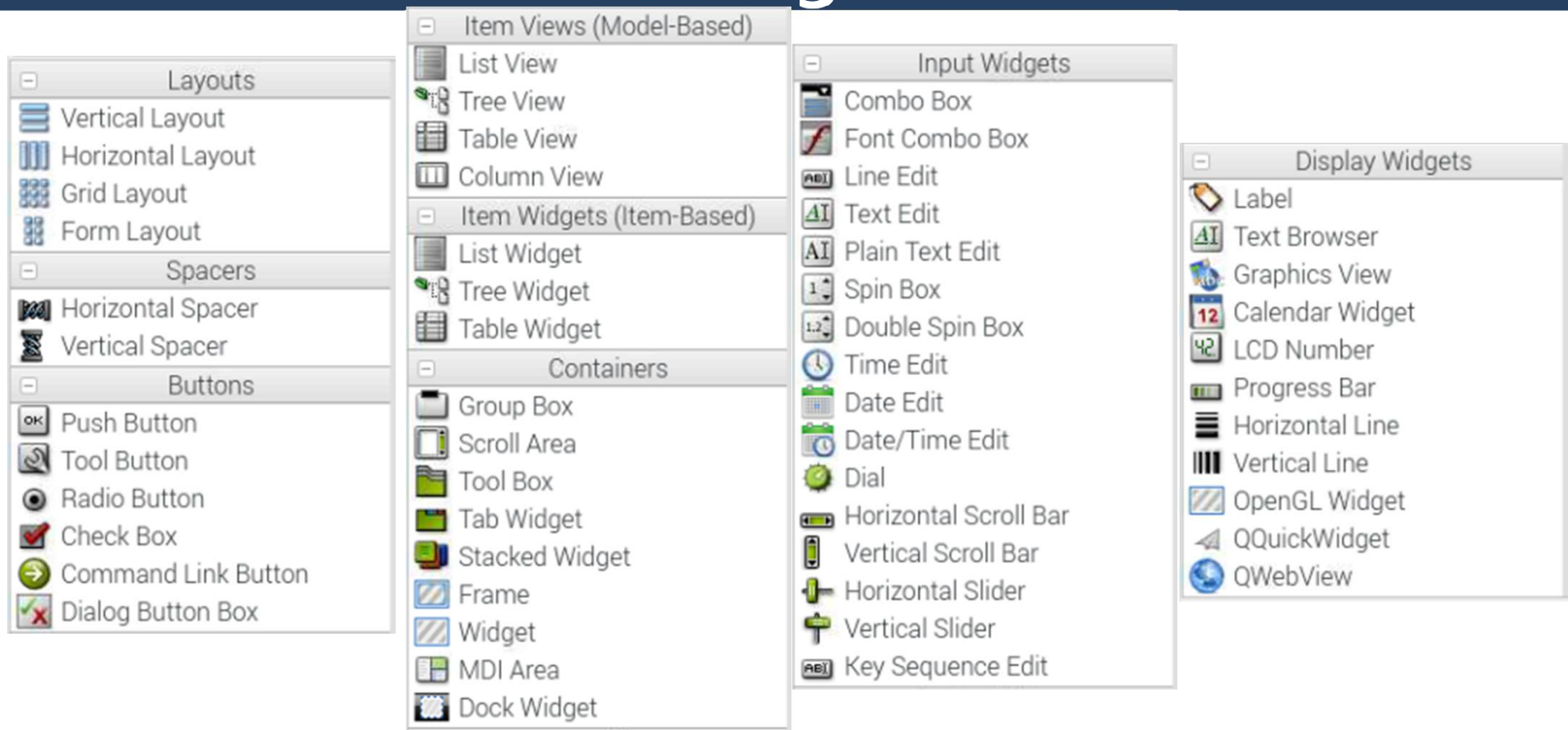


Qt Designer

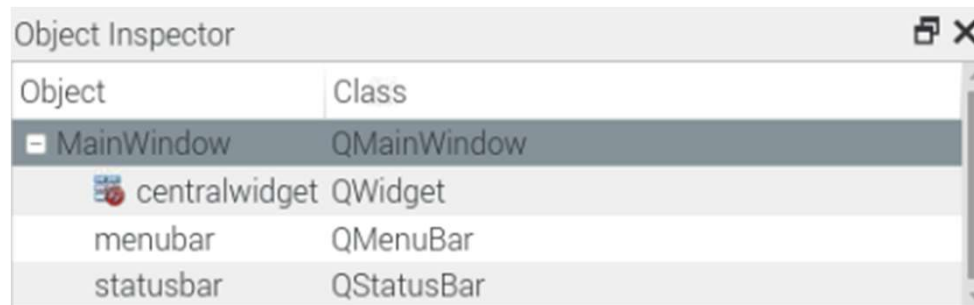


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Widget



Object Inspector

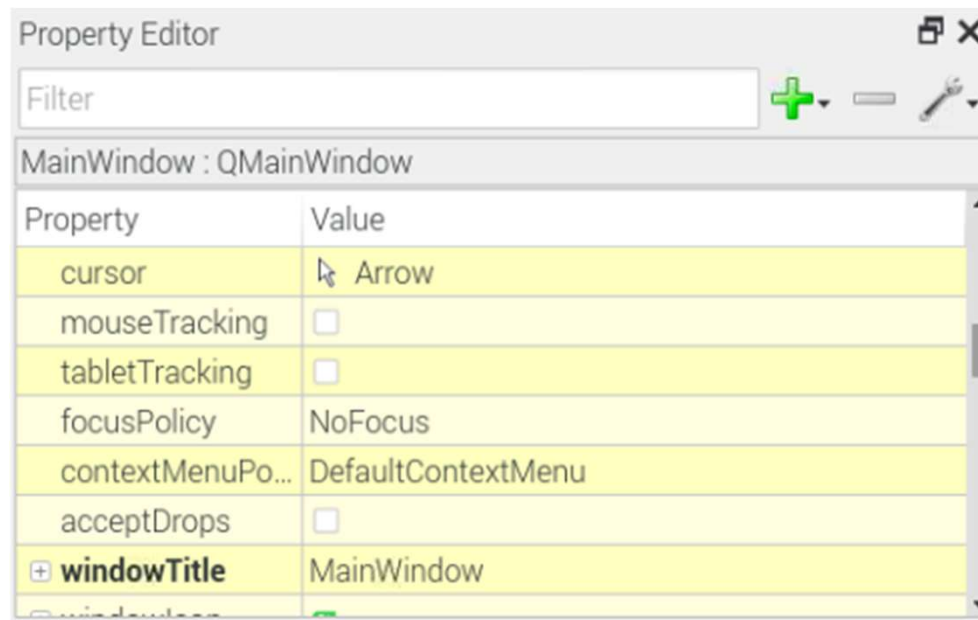


The screenshot shows the 'Object Inspector' window from the Qt IDE. It displays a tree view of the current application's object model. The root object is 'MainWindow' of class 'QMainWindow'. It contains several child objects: 'centralwidget' (class 'QWidget'), 'menubar' (class 'QMenuBar'), and 'statusbar' (class 'QStatusBar'). The 'centralwidget' is expanded, showing its own children: 'menubar' and 'statusbar'.

Object	Class
[-] MainWindow	QMainWindow
[-] centralwidget	QWidget
menubar	QMenuBar
statusbar	QStatusBar



Property Editor



Resource Browser



UI Design

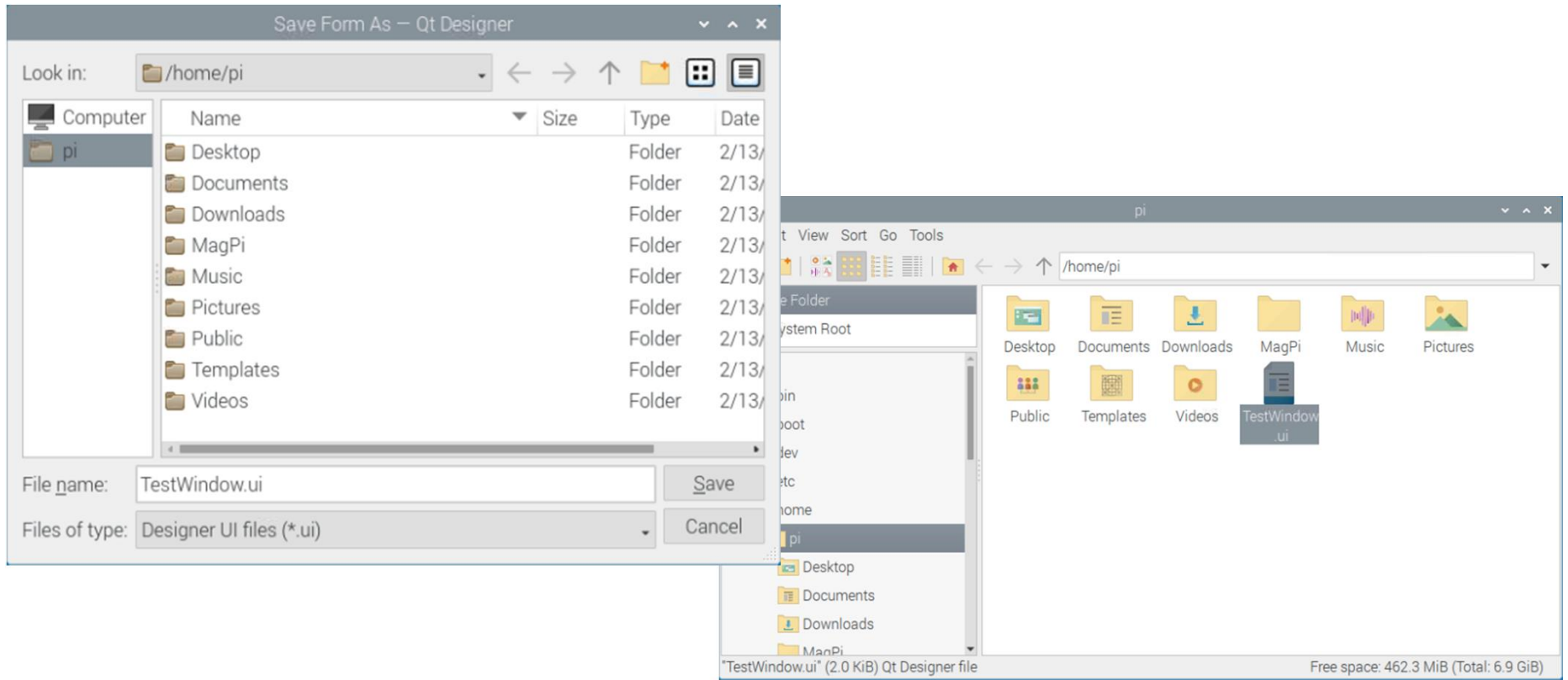


CTRL+R



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SaveAs – TestDialog.ui



TestDialog.ui

```
TestWindow.ui - Mousepad
File Edit Search View Document Help
<?xml version="1.0" encoding="UTF-8"?>
<ui version="4.0">
  <class>Dialog</class>
  <widget class="QDialog" name="Dialog">
    <property name="geometry">
      <rect>
        <x>0</x>
        <y>0</y>
        <width>320</width>
        <height>240</height>
      </rect>
    </property>
    <property name="windowTitle">
      <string>Dialog</string>
    </property>
    <property name="windowOpacity">
      <double>1.0000000000000000</double>
    </property>
    <property name="accessibleName">
      <string/>
    </property>
    <property name="autoFillBackground">
      <bool>false</bool>
    </property>
  </widget>
</ui>
```



Thonny – TestDialog.py

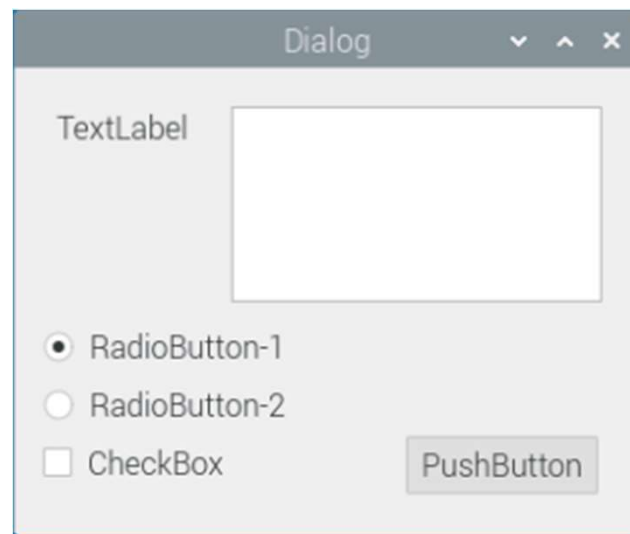
TestDialog.py ✕

```
1 import sys
2 from PyQt5.QtWidgets import *
3 from PyQt5 import uic
4
5 uiDialog='TestDialog.ui'
6
7 class MyDialog(QDialog):
8     def __init__(self):
9         QDialog.__init__(self, None)
10        uic.loadUi(uiDialog, self)
11
12 if __name__ == '__main__':
13     app=QApplication(sys.argv)
14     form=MyDialog()
15     form.show()
16     app.exec()
17
```



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Run



failed to authenticate

libEGL warning: DRI2: failed to authenticate

Terminal : raspi-config

```
pi@raspberrypi: ~  
File Edit Tabs Help  
Raspberry Pi 3 Model B Rev 1.2  
Raspberry Pi Software Configuration Tool (raspi-config)  
1 Change User Password Change password for the 'pi' user  
2 Network Options Configure network settings  
3 Boot Options Configure options for start-up  
4 Localisation Options Set up language and regional settings to match your  
5 Interfacing Options Configure connections to peripherals  
6 Overclock Configure overclocking for your Pi  
7 Advanced Options Configure advanced settings  
8 Update Update this tool to the latest version  
9 About raspi-config Information about this configuration tool  
  
<Select> <Finish>
```

```
pi@raspberrypi: ~  
File Edit Tabs Help  
Raspberry Pi Software Configuration Tool (raspi-config)  
G1 Legacy Original non-GL desktop driver  
G2 GL (Fake KMS) OpenGL desktop driver with fake KMS  
G3 GL (Full KMS) OpenGL desktop driver with full KMS  
  
<Ok> <Cancel>
```

