University of Hertfordshire

7COM1025
Programming for Software Engineers
Lecture 28

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THE ONE HUNDRED UNDER FIFTY

SOFTWARE FRAMEWORKS

Software frameworks add a layer of abstraction to software development.

They provide generic functionality to address a problem.

They allow the user (another programmer) to write code using it
This allows for the development of application specific software

A software frameworks is reusable and it provides a particular functionality.

SOFTWARE FRAMEWORKS

There are many differences between frameworks and libraries (like the STL).

1) When using a library, the flow of control is dictated by the developer. This is not true when using a framework.

When using a framework you must adapt to how the framework works!
This is called inversion control.

2) The user can extend its functionality. You may be able to accomplish this by overloading specific functions or by using specialisation.

3) Unlike a library, a framework has a default behaviour. It is able to do something even if you don't extend it.

4) The source code of the framework itself (normally) isn't designed to be modified by the user. You are allowed to extend it, but not to modify it.

SOFTWARE FRAMEWORKS

There are many reasons to use frameworks, including:

- The code has been (in most cases) thoroughly tested.
- It may reduce the time it takes you to deliver software (after you learn how to use the framework!).
- It may help you to use better programming practices, particularly if you are new.

However,

- Learning to use a particular framework may take considerable time.
- With time a framework that was initially easy to use may become complex.
- You will become dependable of a particular piece of software.
- If you want to develop your own, this will take time and effort.

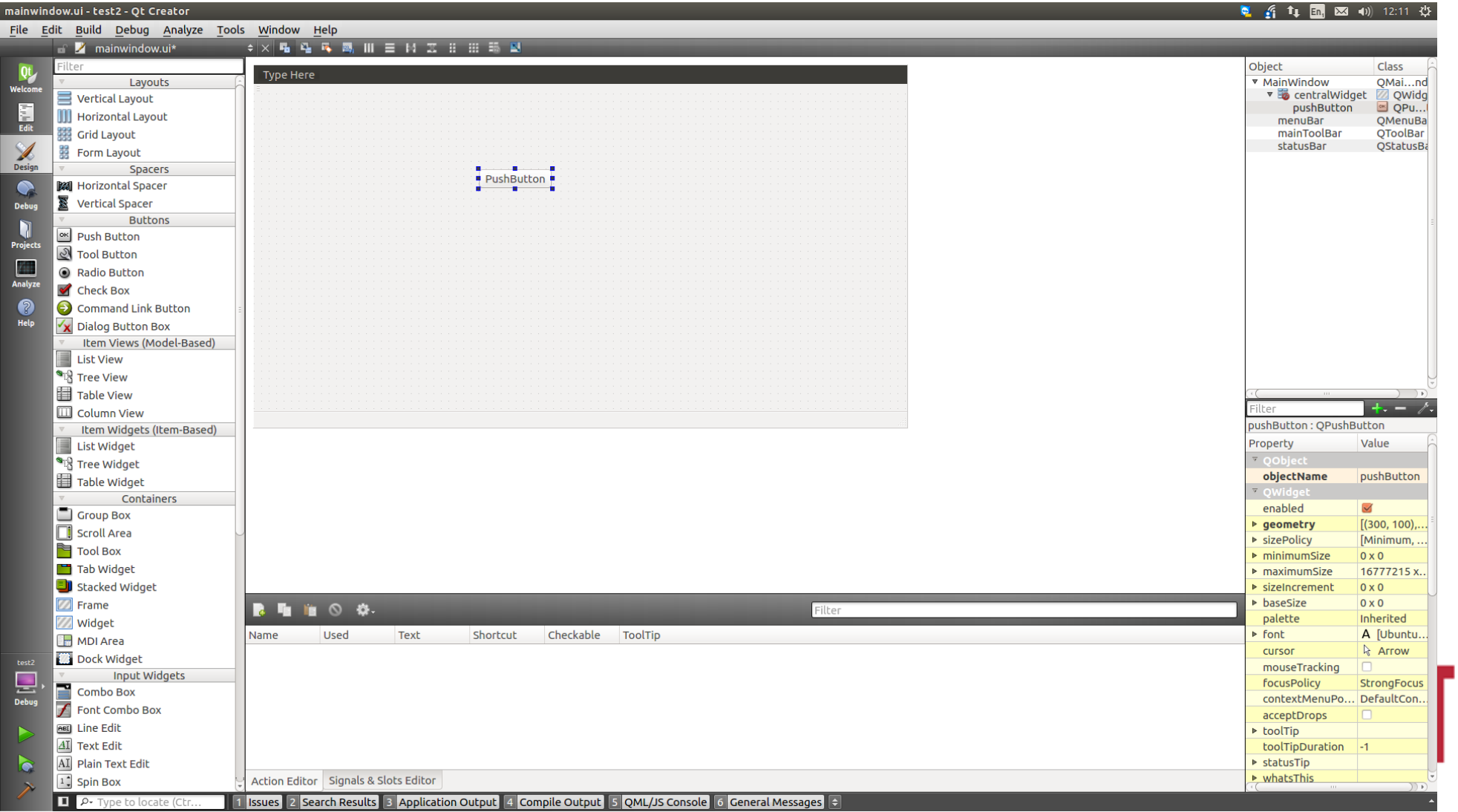
SOFTWARE FRAMEWORKS

There are MANY examples of software frameworks to address the most different problems.
Examples:

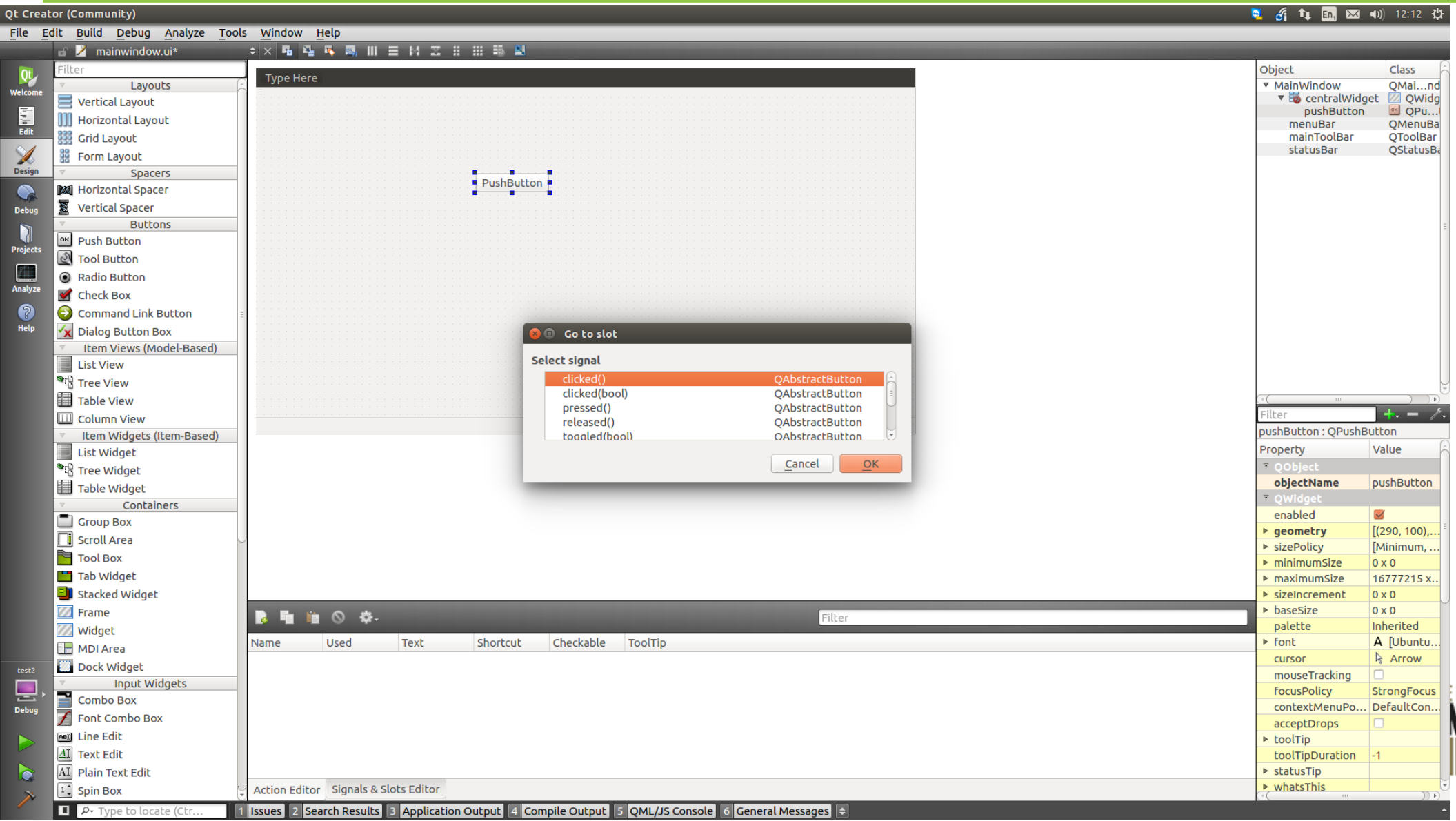
- Ajax
- Django
- QT
- Swing (and JavaFX)
- .Net
- Ruby on rails
- KDE
- GNOME
- Cocoa
- Etc..

QT

QT is a C++ cross-platform framework useful to develop GUI applications



QT


Qt Creator (Community)
File Edit Build Debug Analyze Tools Window Help
mainwindow.ui*
Filter
Layouts
Vertical Layout
Horizontal Layout
Grid Layout
Form Layout
Spacers
Horizontal Spacer
Vertical Spacer
Buttons
Push Button
Tool Button
Radio Button
Check Box
Command Link Button
Dialog Button Box
Item Views (Model-Based)
List View
Tree View
Table View
Column View
Item Widgets (Item-Based)
List Widget
Tree Widget
Table Widget
Containers
Group Box
Scroll Area
Tool Box
Tab Widget
Stacked Widget
Frame
Widget
MDI Area
Dock Widget
Input Widgets
Combo Box
Font Combo Box
Line Edit
Text Edit
Plain Text Edit
Spin Box
Type Here
PushButton
Go to slot
Select signal
clicked() QAbstractButton
clicked(bool) QAbstractButton
pressed() QAbstractButton
released() QAbstractButton
Cancel
OK
Object
Class
MainWindow
centralWidget
pushButton
menuBar
mainToolBar
statusBar
pushButton : QPushButton
Property
Value
QObject
objectName
pushButton
QWidget
enabled
geometry
sizePolicy
minimumSize
maximumSize
sizeIncrement
baseSize
palette
font
cursor
mouseTracking
focusPolicy
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acceptDrops
toolTip
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Name
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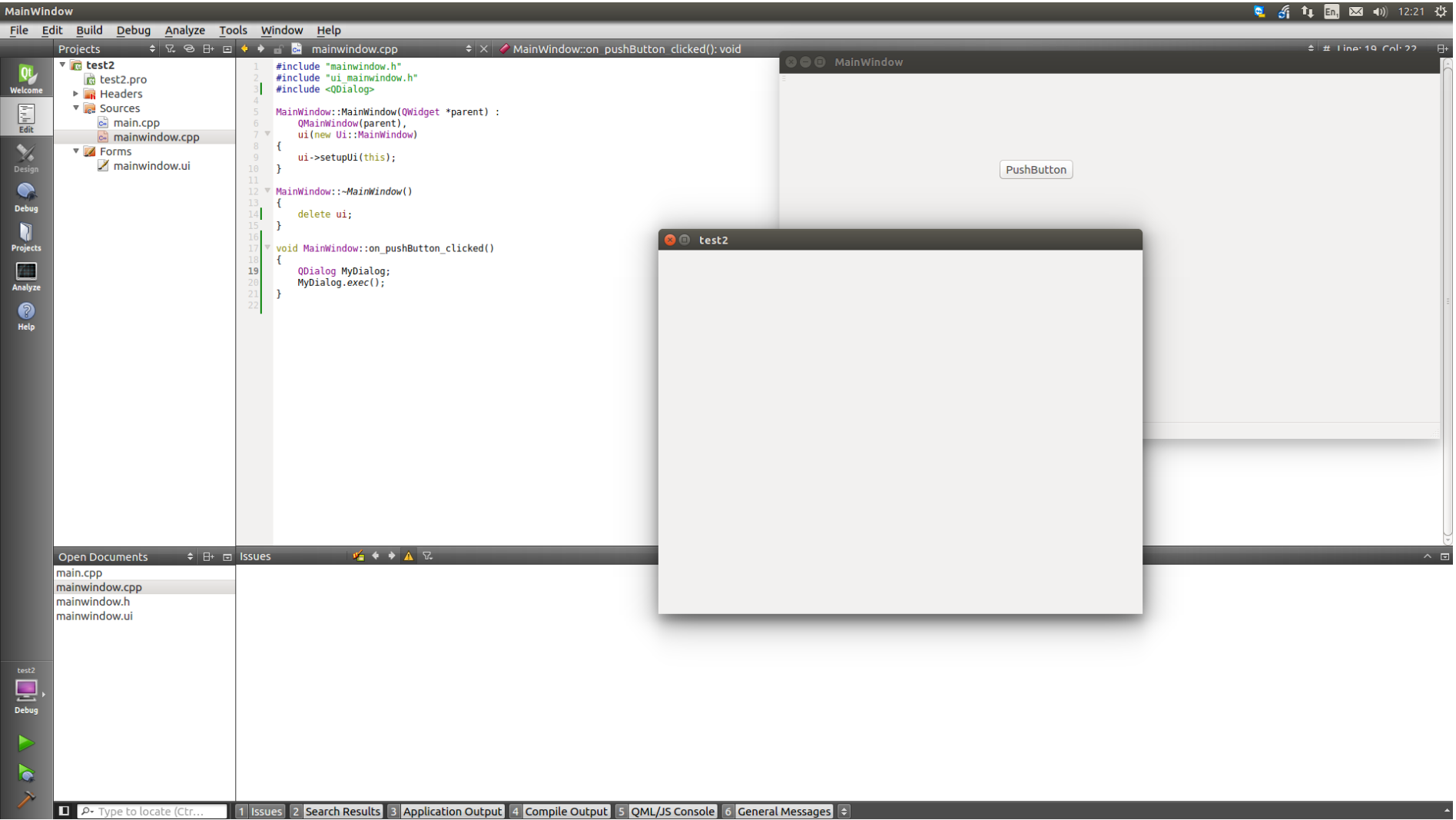
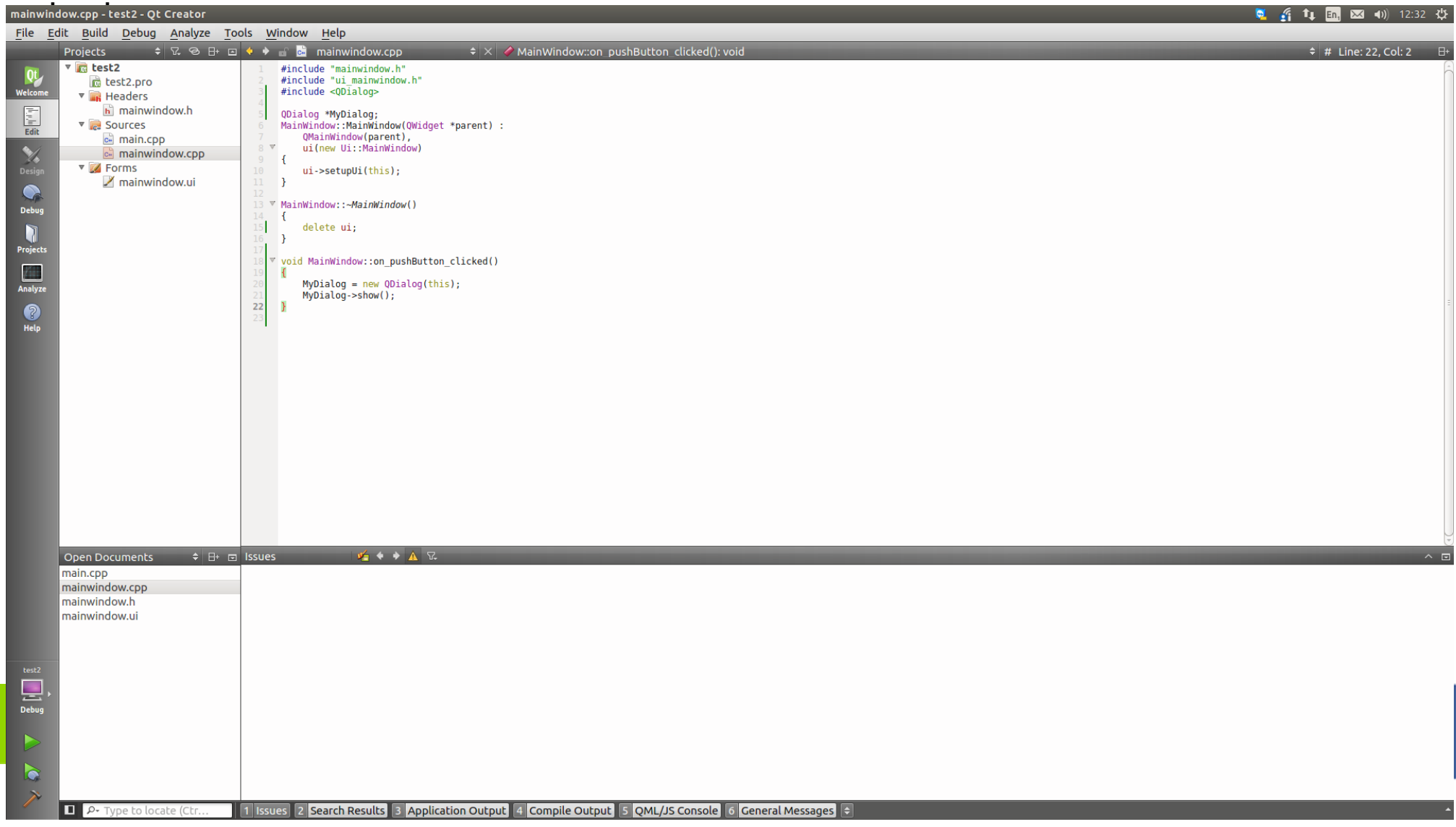
Text
Shortcut
Checkable
ToolTip
Action Editor
Signals & Slots Editor
Welcome
Edit
Design
Debug
Projects
Analyze
Help
test2
Debug
Type to locate (Ctr...
1 Issues
2 Search Results
3 Application Output
4 Compile Output
5 QML/JS Console
6 General Messages

QT

You could ask, why not something like .show() as in most other languages?



QT


mainwindow.cpp - test2 - Qt Creator
File Edit Build Debug Analyze Tools Window Help
Projects
test2
test2.pro
Headers
mainwindow.h
Sources
main.cpp
mainwindow.cpp
Forms
mainwindow.ui
mainwindow.cpp
MainWindow::on_pushButton_clicked(): void
Line: 22, Col: 2
#include "mainwindow.h"
#include "ui_mainwindow.h"
#include <QDialog>
QDialog *MyDialog;
MainWindow::MainWindow(QWidget *parent) :
QMainWindow(parent),
ui(new Ui::MainWindow)
{
ui->setupUi(this);
}
MainWindow::~MainWindow()
{
delete ui;
}
void MainWindow::on_pushButton_clicked()
{
MyDialog = new QDialog(this);
MyDialog->show();
}
Open Documents
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mainwindow.cpp
mainwindow.h
mainwindow.ui
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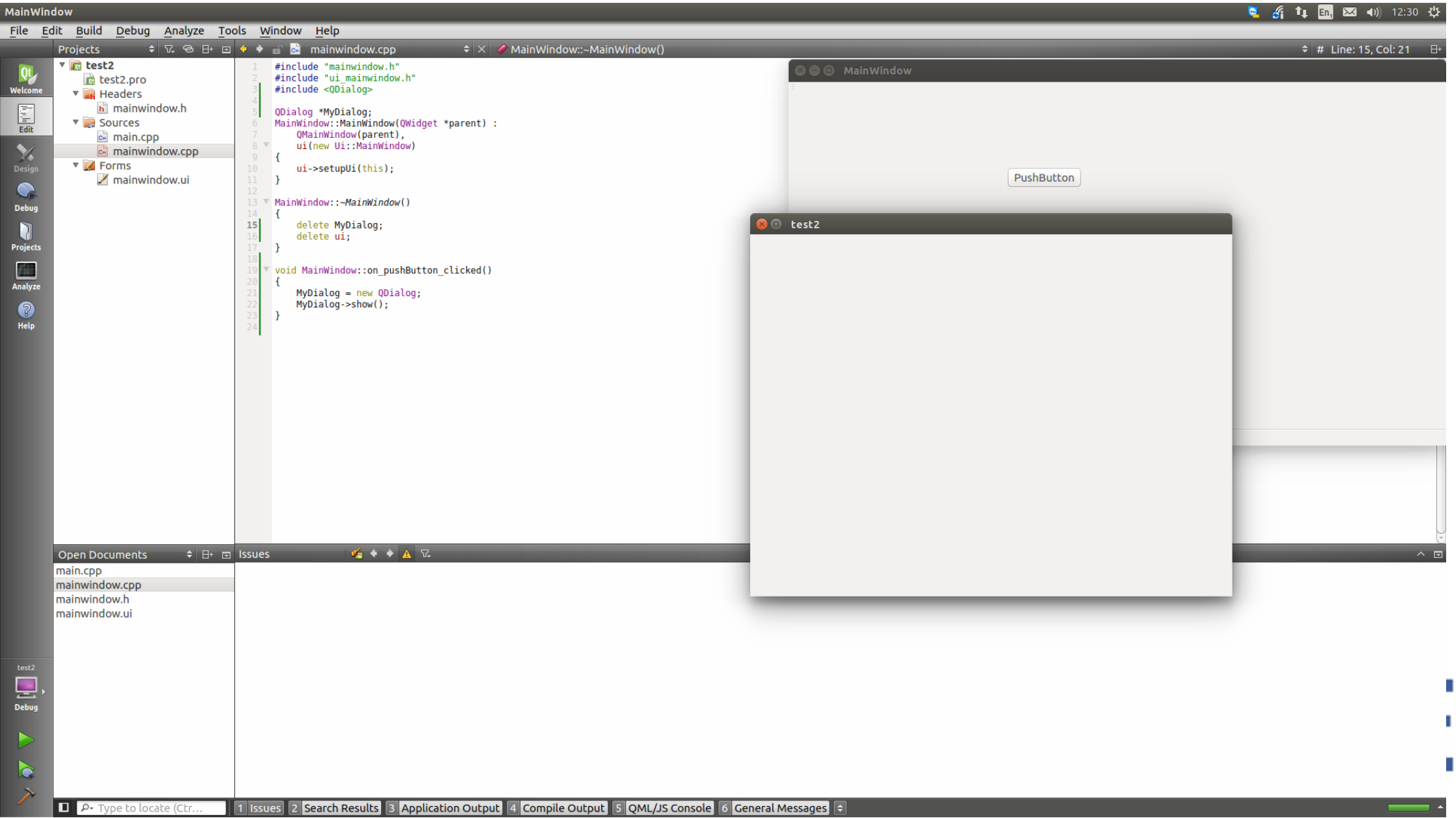
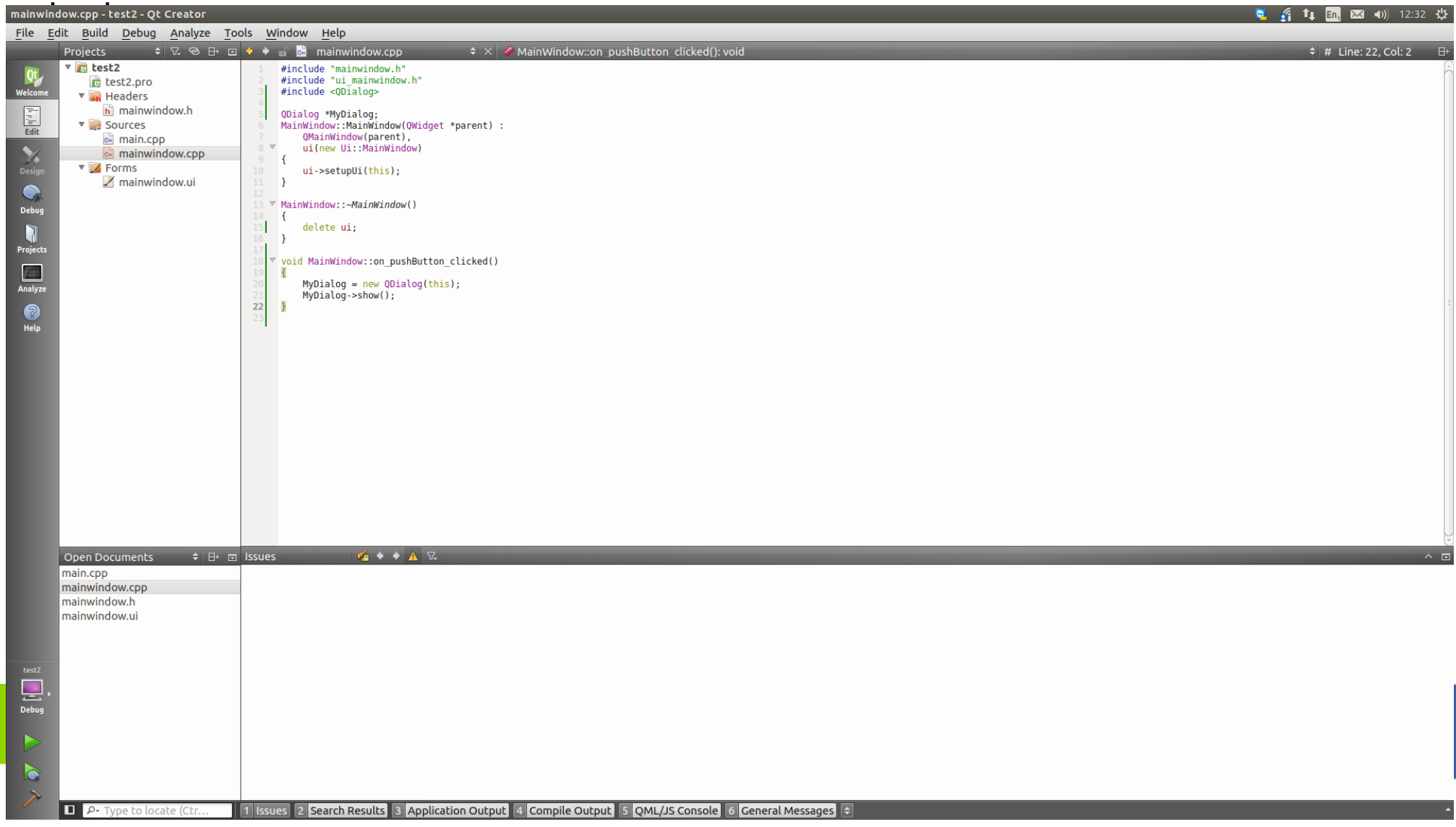


ONE HUNDRED UNDER FIFTY

QT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