



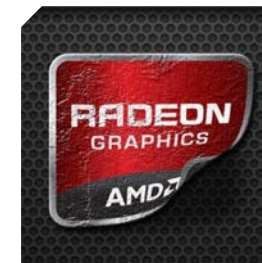
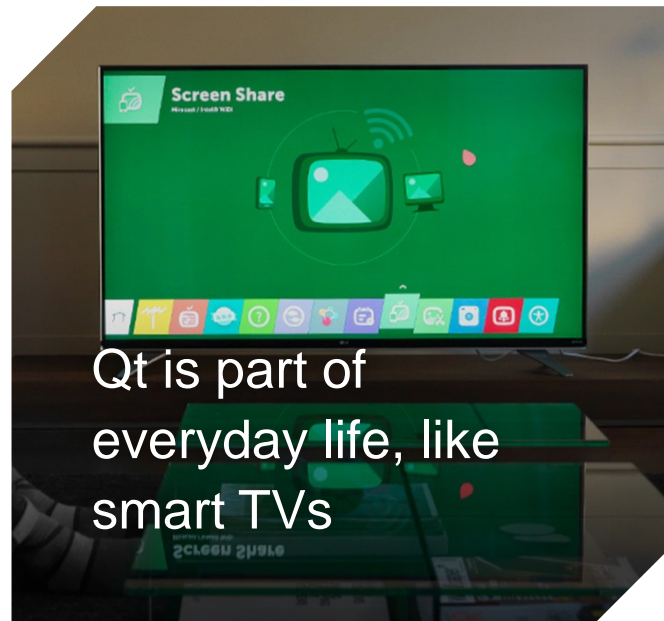
# Meet Qt for JAMK

Sami Makkonen / The Qt Company

20.9.2017



Built with Qt



# Target All Your End Users with One Technology

## Embedded:

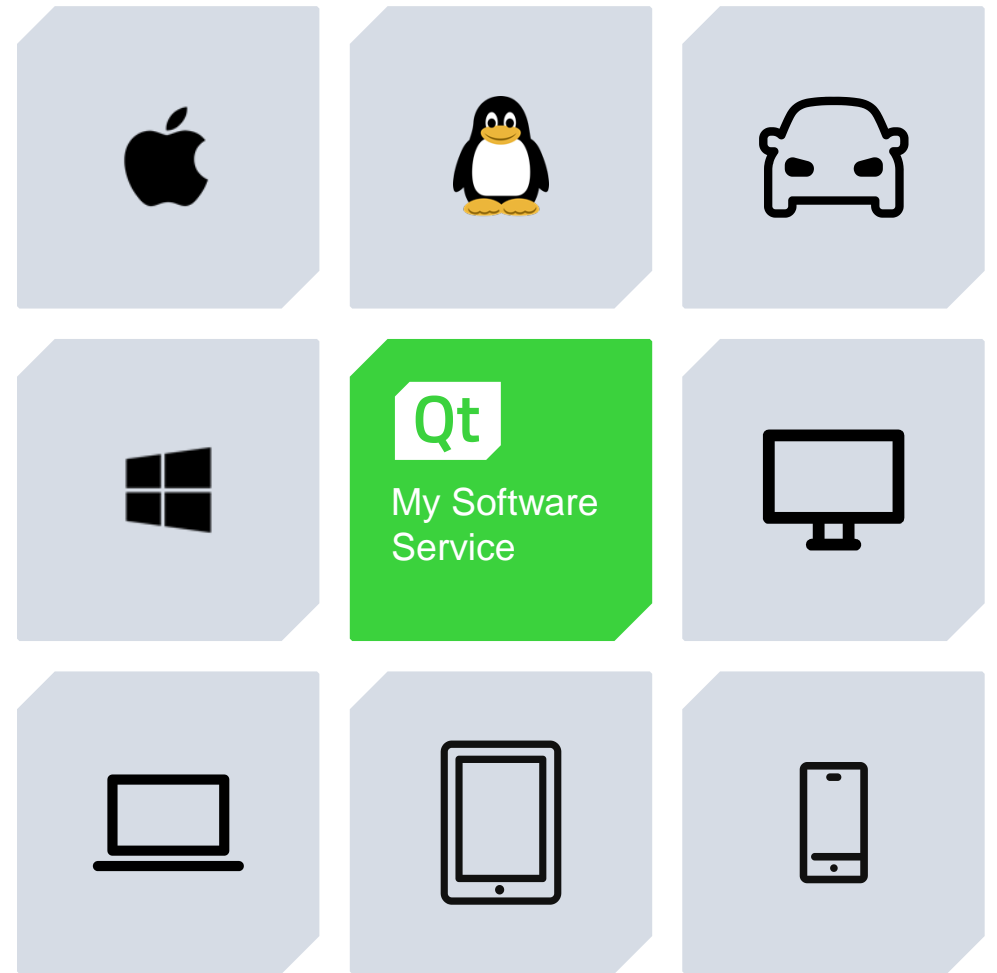
- › Embedded Linux, Windows Embedded
- › RTOS: QNX, VxWorks, INTEGRITY

## Desktop:

- › Windows, Linux, Mac OS X

## Mobile:

- › Android, iOS, Windows 10, WinRT, Universal Windows Platform



# All-in-one



All in One -  
Framework

Powerful & Modern  
Development  
Framework



Code Once,  
Deploy  
Everywhere

Cross-Platform  
Integrated  
Development Tools



Productive  
development  
environment

Cross-Platform IDE,  
Qt Creator

# Qt Application Development Offering

## Add-Ons

Canvas 3D	Charts	Qt Quick 2D renderer	Data Visualization	Purchasing
Active Qt	Graphical Effects	NFC	Location	Qt 3D
X11, Windows, Mac Extras	Print Support	Sensors	Concurrent	WebEngine
Android Extras	Image Formats	Positioning	Serial Port	WebSockets
XML & XML Patterns	SVG	Bluetooth	D-Bus	WebChannel

## Essentials

		Multimedia Widgets	Quick Dialogs	Quick Controls
GUI	Widgets	Multimedia	Quick Layouts	Quick
Core	Network	SQL	Test	QML

## Desktop & mobile platforms

Windows	Mac	Linux Desktop	Android	iOS	WinRT
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## Development Tools

Qt Creator Cross-platform IDE	CPU usage analyzer
Qt Designer GUI Designer	QML Profiler
Qt Linguist I18N Toolset	Clang static analyzer
Qt Assistant Documentation Tool	Qt Quick Compiler
moc, uic, rcc Build Tools	Qt Visual Studio Add-In
qmake Cross-platform Build Tool	Autotest integration

# Developing with Qt

- › Development languages
  - › C++
  - › QML + JavaScript
  - › Python (<https://wiki.qt.io/PySide2>)
- › User Interface
  - › C++ Widgets
  - › Qt Quick / QML & Qt Quick Controls
  - › HTML5 with Qt WebEngine



Qt

# Tools

Qt

5.9



# Boost the Development with Qt Tools

## Develop

- › Code once, deploy on all major platforms
- › Intuitive, productive programming APIs

## Test

- › Write auto tests while developing
- › Run tests to check your APIs

## Analyze

- › Analyze code to find bugs
- › Profile to find rendering bottlenecks

## Optimize

- › Find bottlenecks and optimize your code



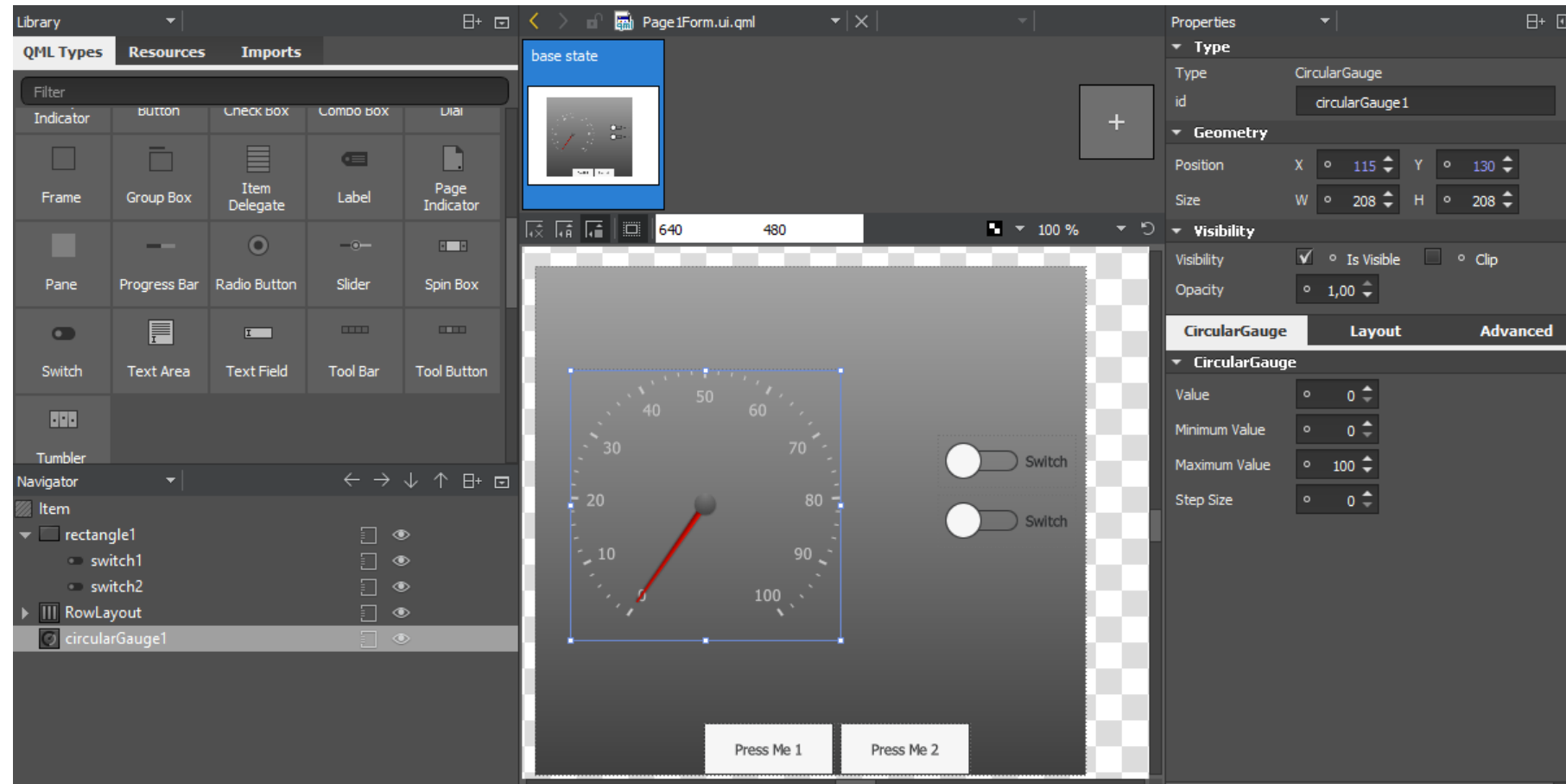
## All tools integrated into a single IDE – Qt Creator

- › No need to switch between the tools during the development
- › No need to copy files between the tools
- › Testing and profiling in target HW



# Qt Quick Designer – Functionality Meets Design

- › Visual drag'n'drop UI editor
  - › Built-in to Qt Creator 4
  - › Designer-friendly
- › Integrated Qt Quick Controls
  - › Rapid way for UI design
  - › Seamless designer-developer workflow
- › Separated UI presentation from UI logic



Drag'n'drop all Qt Quick Controls, manage their hierarchy, layout, properties and directly connect them to each other.

# Productivity Enhancing Tools

Save time in development by locating bugs and optimize performance bottlenecks easily

## Static Analyzer

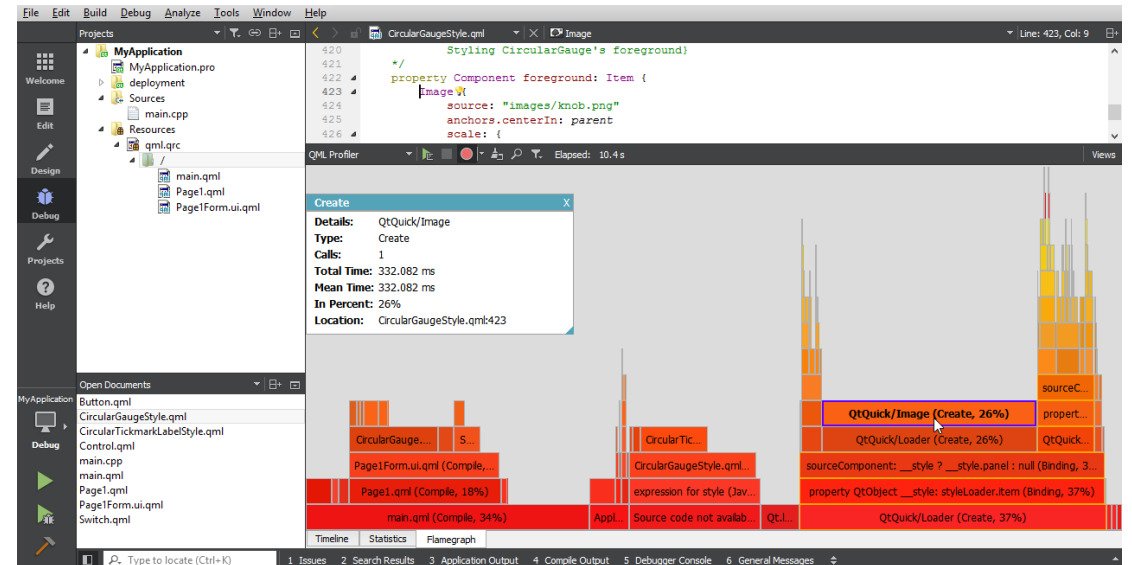
- › Find problems, which cannot be detected by compilers

## Memory Profiler

- › Check memory usage during development

## QML Profiler

- › Locate rendering and QML bottlenecks





# How to get started



# What do you need to install?

## › Qt libraries & development tools

- › [http://download.qt.io/official\\_releases/online\\_installers/](http://download.qt.io/official_releases/online_installers/)
- › See <http://doc.qt.io/qt-5/gettingstarted.html> for instructions

## › Desktop

- › Windows – MinGW compiler included in Qt installer, Visual Studio also supported

## › Linux

- › Build/devel essentials & Mesa dev - See <http://doc.qt.io/qt-5/linux.html> for details

## › Android

- › Android SDK & NDK
- › See <http://doc.qt.io/qt-5/androidgs.html> for details

## › iOS

- › Mac, Xcode
- › iOS Developer account and needed certificates – See <http://doc.qt.io/qt-5/ios-support.html> for details

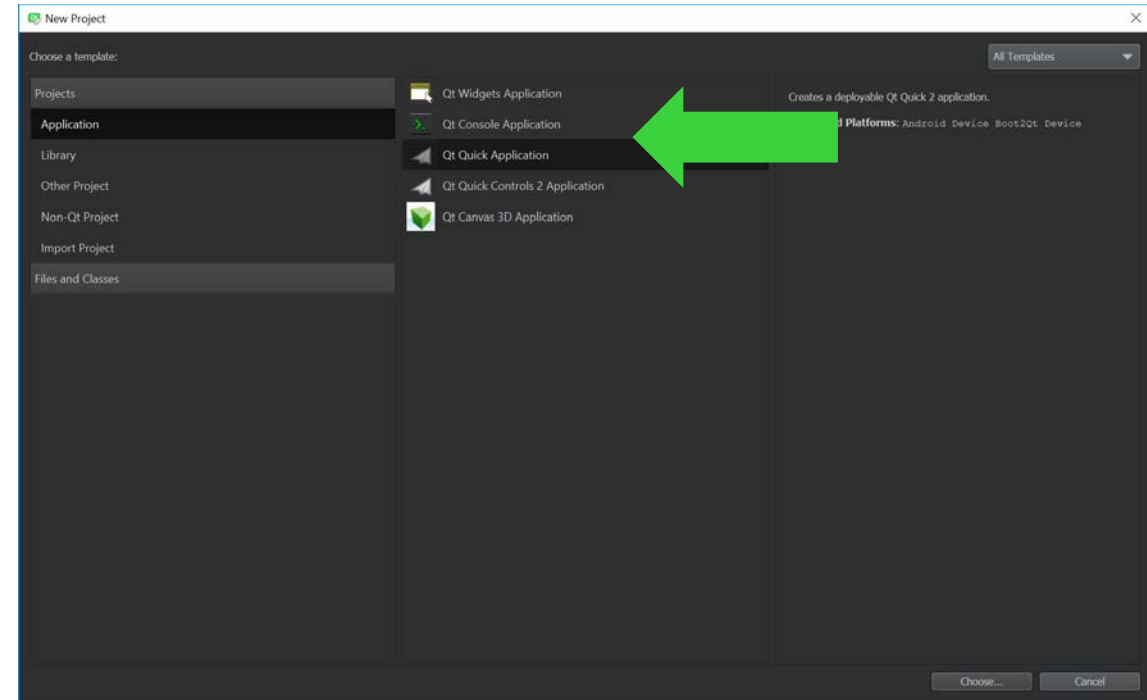
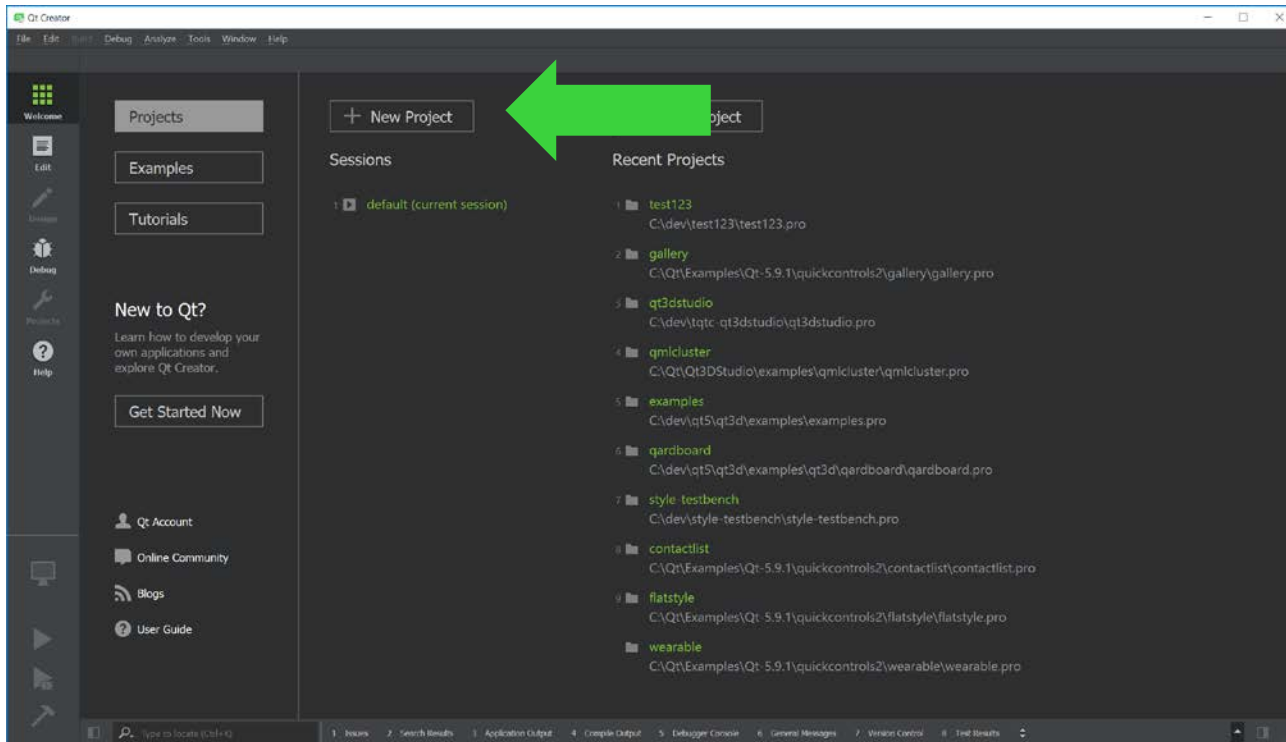
## › Embedded Linux

- › Raspbian Stretch – Qt Creator and Qt 5.7.1 available in package repositories i.e. for on device development just *apt-get install qtcreator*

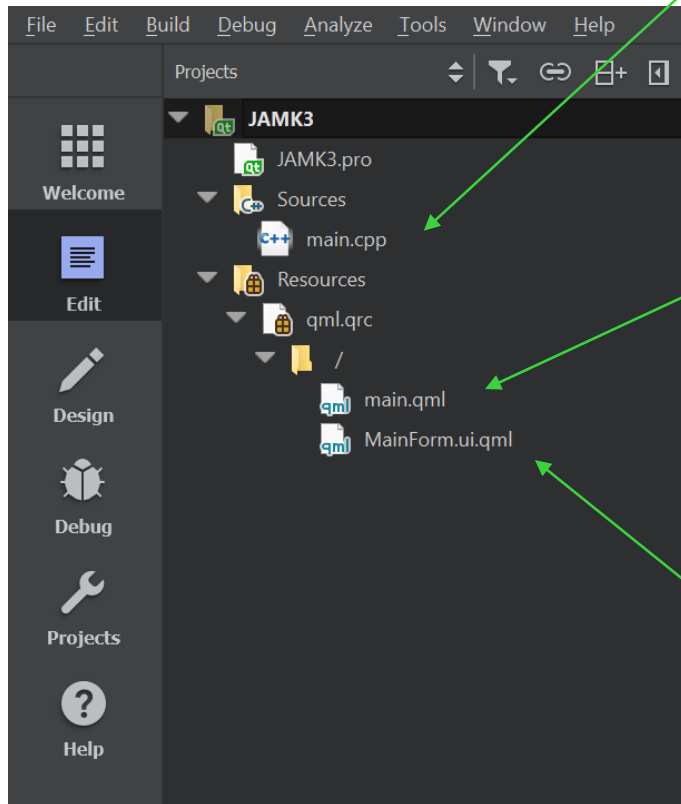
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<input type="checkbox"/> Qt Network Auth (TP)		5.9.1-0-201706290359	2017-06-29
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<input type="checkbox"/> Qt Installer Framework 2.0		2.0.5-2	2017-03-30
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Use MaintenanceTool under install dir to  
change installed components

# Creating a new Qt Quick project



# Project structure



```
#include <QGuiApplication>
#include <QQmlApplicationEngine>

int main(int argc, char *argv[])
{
    qputenv("QT_IM_MODULE", QByteArray("qtvirtualkeyboard"));

    QGuiApplication app(argc, argv);

    QQmlApplicationEngine engine;
    engine.load(QUrl(QStringLiteral("qrc:/main.qml")));
    if (engine.rootObjects().isEmpty())
        return -1;

    return app.exec();
}
```

C++

No need to modify if creating a pure QML application

```
import QtQuick 2.8
import QtQuick.Window 2.2

Window {
    visible: true
    width: 640
    height: 480
    title: qsTr("Hello World")
    id: root

    MainForm {
        anchors.fill: parent
        mouseArea.onClicked: {
            console.log(qsTr('Clicked on background. Text: ' + textEdit.text + ''))
        }
    }
}
```

QML & JavaScript

Application logic

```
import QtQuick 2.8

Rectangle {
    property alias mouseArea: mouseArea
    property alias textEdit: textEdit
    width: 360
    height: 360
    MouseArea {
        id: mouseArea
        anchors.fill: parent
    }
    TextEdit {
        id: textEdit
        text: qsTr("Enter some text...")
        anchors.top: parent.top
        anchors.horizontalCenter: parent.horizontalCenter
        anchors.topMargin: 20
        Rectangle {
            anchors.fill: parent
            anchors.margins: -10
            color: "transparent"
            border.width: 1
        }
    }
}
```

QML

UI definition

# QML Key concepts

- › Documentation: <http://doc.qt.io/qt-5/qmlfirststeps.html>
- › Qt Quick types (e.g. Rectangle, MouseArea, ListView etc.):  
<http://doc.qt.io/qt-5/qtquick-qmlmodule.html>
- › Property binding: <http://doc.qt.io/qt-5/qtqml-syntax-propertybinding.html>
- › Signals and Signal Handlers: <http://doc.qt.io/qt-5/qtqml-syntax-signals.html>
- › Qt Quick Controls 2: <http://doc.qt.io/qt-5/qtquickcontrols2-index.html>



# Sources of information

- › Documentation

- › <http://doc.qt.io/>

- › Training material (Videos)

- › <https://www.youtube.com/user/QtStudios>

- › <https://www.qt.io/qt-training-materials/>

- › VoidRealms Introduction to QML [https://www.youtube.com/watch?v=iBDiDyU\\_FgQ](https://www.youtube.com/watch?v=iBDiDyU_FgQ)

- › VoidRealms C++/Qt <https://www.youtube.com/watch?v=6KtOzh0StTc&list=PL2D1942A4688E9D63>

- › Qt Forum

- › <https://forum.qt.io/>

- › StackOverflow

- › QML: <https://stackoverflow.com/questions/tagged/qml>

- › Qt: <https://stackoverflow.com/questions/tagged/qt>

# THE FUTURE

is written with

