## 0.QML的运行

首先，有两种方法来运行qml文件1.使用qt安装目录下面的bin目录的qmlscene.exe来运行一个qml文件，好处是

该qml文件不需要Window元素作为根元素也是可以的。而且可以随时运行，不需要生成任何文件2.使用QtCreator运行，需要在一个完整的qml项目中运行，而且入口是main.qml

而且必须一window元素作为根元素，否则不可见，这个方法的好处是可以生成一个exe文件。

## 1.Rectangle元素：他的父元素可以是一个window元素

常见属性：x，y，width，height，anchors(有很多子属性：anchors.horizontalCenter，anchors.verticalCenter，anchors.centerIn，anchors.fill)

border(有很多子属性: border.color, border.width,还有一些事件处理方法)，roration：旋转角度，scale：缩放控件小于1是缩小，大于1是放大，

antialiasing：反锯齿，默认是true，radius：控制圆角的大小，gradient: 颜色渐变效果

实例：

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| --- | --- |
| import QtQuick 2.12  import QtQuick.Window 2.12  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  Rectangle{  // x:20  // y:20  width: 300  height: 200  border.color: "pink"  border.width: 5  //rotation: 90  //scale: 0.5 //小于1是缩小，大于1是放大  //antialiasing: false  gradient: Gradient { //颜色渐变效果  GradientStop { position: 0.0; color: "lightsteelblue" }  GradientStop { position: 1.0; color: "blue" }  }  radius: 20  anchors.centerIn: *parent* //在父窗体中居中显示  //anchors.horizontalCenter: parent.horizontalCenter //在父窗体中水平居中显示  //anchors.verticalCenter: parent.verticalCenter //在父窗体中垂直居中显示  Image {  x:80  y:30  id: *img1*  focus: true  width: 100  height: 100  source: "gkiss.jpg"  Keys.onReturnPressed:*console*.log("enter pressed") //响应回车键按下, 接收该事件的对象必须处于聚焦状态focus:ture  //anchors.fill: parent  }  // MouseArea{ //鼠标点击事件  // anchors.fill: parent  // //onClicked: console.log("clicked")  // onClicked: {img1.width +=10;img1.height +=10}  // }  }  Rectangle{  id:*rec1*  Text {  id: *name1*  text: *qsTr*("变大")  anchors.centerIn: *parent*  }  x:210  y:350  width: 100  height: 50  color: 'purple'  MouseArea{ //鼠标点击事件  anchors.fill: *parent*  //onClicked: console.log("clicked")  onClicked: {*img1*.width +=10;*img1*.height +=10}  }  }  //anchors的上下左右属性是用来确定位置的，anchors.fill属性是用来填充的  Rectangle{  id:*rec2*  Text {  id: *name2*  anchors.centerIn: *parent*  text: *qsTr*("变小")  }  width: 100  height: 50  anchors.bottom: *rec1*.bottom  anchors.left: *rec1*.right  anchors.leftMargin: 20  color: 'blue'  MouseArea{ //鼠标点击事件  anchors.fill: *parent*  //onClicked: console.log("clicked")  onClicked: {*img1*.width -=10;*img1*.height -=10}  }  }  } |  |

## 2.创建自定义Rectangle：

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| --- | --- |
|  |  |
| //main.qml  import QtQuick 2.12  import QtQuick.Window 2.12  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  CustomRect{ //可以直接引用在同级目录下面的qml文件  width:300  height: 200  myTopMargin: 10  myBottomMargin: 10  anchors.centerIn: *parent*  }  } | //CustomRect.qml  import QtQuick 2.0  Rectangle {  id:*borderRect*  property int myTopMargin:0  property int myBottomMargin:0  color: "purple"  Rectangle{  id:*innerRect*  color: "green"  anchors.fill: *parent*  anchors.topMargin: *myTopMargin*  anchors.leftMargin: 5  anchors.rightMargin: 5  anchors.bottomMargin: *myBottomMargin*  }  } |

## 3.states 和 transitions 动画效果制作

states是一个列表，里面有一些状态，它是当我们设置一个控件颜色的state属性的时候被触发，实现预先定义好的功能

例如，在CustomRect.qml中添加states，并且设置state属性，效果如下

|  |  |
| --- | --- |
| //CustomRect.qml  import QtQuick 2.0  Rectangle {  id:*borderRect*  property int myTopMargin:0  property int myBottomMargin:0  color: "purple"  Rectangle{  id:*innerRect*  color: "green"  anchors.fill: *parent*  anchors.topMargin: *myTopMargin*  anchors.leftMargin: 5  anchors.rightMargin: 5  anchors.bottomMargin:*myBottomMargin*  state: "blue\_color" //这个名称必须是下面的其中之一  states: [  State {  name: "red\_color"  PropertyChanges {  target: *innerRect*;  color:"red"  }  },  State {  name: "blue\_color"  PropertyChanges {  target: *innerRect*;  color:"blue"  }  }  ]  }  } |  |

### 还可以通过鼠标点击来修改状态：

|  |  |
| --- | --- |
| //  import QtQuick 2.0  Rectangle {  id:*borderRect*  property int myTopMargin:0  property int myBottomMargin:0  color: "purple"  Rectangle{  id:*innerRect*  color: "green"  anchors.fill: *parent*  anchors.topMargin: *myTopMargin*  anchors.leftMargin: 5  anchors.rightMargin: 5  anchors.bottomMargin:*myBottomMargin*  //state: "red\_color"  states: [  State {  name: "red\_color"  PropertyChanges {  target: *innerRect*;  color:"red"  }  },  State {  name: "blue\_color"  PropertyChanges {  target: *innerRect*;  color:"blue"  }  }  ]  MouseArea{  anchors.fill: *parent*  onPressed: {  *innerRect*.state = "red\_color"  }  onReleased: {  *innerRect*.state = "blue\_color"  }  }  }  } |  |

### animation属性：可以实现一些动画效果，如颜色慢慢变成绿色，透明度由透明慢慢变为不透明

|  |  |
| --- | --- |
| import QtQuick 2.12  import QtQuick.Window 2.12  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  // CustomRect{ //可以直接引用在同级目录下面的qml文件  // width:300  // height: 200  // myTopMargin: 10  // myBottomMargin: 10  // anchors.centerIn: parent  // }  Rectangle{  id:*flashing*  width: 75;height: 75  color: "blue"  opacity: 1.0  MouseArea{  anchors.fill: *parent*  onClicked: {  *animateColor*.start()  *animateOpacity*.start()  }  }  PropertyAnimation{  id: *animateColor*;  target:*flashing*;  properties:"color";  to:"green";  duration:2000  }  NumberAnimation {  id: *animateOpacity*  target:*flashing*  property: "opacity"  from:0.09  to:1.0  duration: 5000  easing.type: Easing.InOutQuad  }  }  } |  |

**注意，在PropertyAnimation的后面跟 on 再跟属性名称，里面的效果会在窗体启动的时候自动调用，没有on需要在MouseArea的onClicked事件中触发。**

### 还有按顺序的动画：先做a效果，再做b效果

|  |  |
| --- | --- |
| import QtQuick 2.12  import QtQuick.Window 2.12  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  // CustomRect{ //可以直接引用在同级目录下面的qml文件  // width:300  // height: 200  // myTopMargin: 10  // myBottomMargin: 10  // anchors.centerIn: parent  // }  Rectangle{  id:*flashing*  width: 75;height: 75  color: "blue"  opacity: 1.0  MouseArea{  anchors.fill: *parent*  onClicked: {  *animateColor*.start()  *animateOpacity*.start()  *animateWidth*.start()  *animateHeight*.start()  *animateX*.start()  }  }  //直接方法  PropertyAnimation{  id: *animateColor*;  target:*flashing*;  properties:"color";  to:"green";  duration:2000  }  NumberAnimation {  id: *animateOpacity*  target:*flashing*  property: "opacity"  from:0.09  to:1.0  duration: 5000  easing.type: Easing.InOutQuad  }  NumberAnimation {  id: *animateWidth*  target:*flashing*  property: "width"  from:75  to:200  duration: 3000  easing.type: Easing.InOutQuad  }  NumberAnimation {  id: *animateHeight*  target:*flashing*  property: "height"  from:75  to:200  duration: 3000  easing.type: Easing.InOutQuad  }  NumberAnimation {  id: *animateX*  target:*flashing*  property: "x"  from:0  to:100  duration: 3000  easing.type: Easing.InOutQuad  }  //后面有on的动画会自动执行  PropertyAnimation on width{  to:300  duration:2000  }  PropertyAnimation on height{  to:300  duration:2000  }  // PropertyAnimation on color{  // to:"yellow"  // duration:1000  // }  ColorAnimation on color{  to:"orange"  duration:1000  }  SequentialAnimation on color{  ColorAnimation {  to: "black"  duration: 1000  }  ColorAnimation {  to: "green"  duration: 1000  }  ColorAnimation {  to: "purple"  duration: 1000  }  ColorAnimation {  to: "deeppink"  duration: 1000  }  ColorAnimation {  to: "yellow"  duration: 1000  }  ColorAnimation {  to: "cyan"  duration: 1000  }  ColorAnimation {  to: "orange"  duration: 1000  }  ColorAnimation {  to: "red"  duration: 1000  }  }  }  } | **效果矩形会慢慢变大，颜色会按照**  SequentialAnimation的先后**顺序改变** |

**注意：修改颜色有多种方法：可以使用**ColorAnimation on color，SequentialAnimation on color，PropertyAnimation on color

### transition是状态改变的渐变效果，如果没有它，状态是一下子就改变了，有了它可以设置渐变效果已经渐变时间

|  |
| --- |
| Rectangle {  width: 75; height: 75  id: *button*  state: "RELEASED"  MouseArea {  anchors.fill: *parent*  onPressed: *button*.state = "PRESSED"  onReleased: *button*.state = "RELEASED"  }  states: [  State {  name: "PRESSED"  PropertyChanges { target: *button*; color: "blue"}  },  State {  name: "RELEASED"  PropertyChanges { target: *button*; color: "lightsteelblue"}  }  ]  transitions: [  Transition {  from: "PRESSED"  to: "RELEASED"  ColorAnimation { target: *button*; duration: 3000}  },  Transition {  from: "RELEASED"  to: "PRESSED"  ColorAnimation { target: *button*; duration: 2000}  }  ]  }  效果，在矩形里面点击鼠标颜色会慢慢变成蓝色，松开鼠标颜色会慢慢变为浅蓝色 |

**还有behavior和其他但是在实际的应用在state和transition来触发动画效果是比较常用的方式**

## 4.Component和Loader

**Component是组件的意思，QML中所有的元素都是Component，它最常用的信号是onCompleted，组件加载完成时触发**

**还有一个on**[**Destruction**](qml-qtqml-component.html#destruction-signal) ，在组件被销毁的时候调用

**实例：**

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| --- | --- |
| import QtQuick 2.15  import QtQuick.Window 2.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  Component.onCompleted: *console*.log("finished....")//window 本身就有一个Component  Component.onDestruction: *console*.log("deconstrution...")  Item {  id: *item1*  width: 200  height:200  Component{  id:*redSquare*  Rectangle{  color: "red"  width: 100  height: 100  }  }  // Loader{ //Component需要Loader来加载，否则不会显示  // sourceComponent: redSquare  // }  Loader{ //Component需要Loader来加载，否则不会显示,有多个Loader就加载多次  sourceComponent: *redSquare*; x:100  }  }  } |  |

### 注意:可以使用loader来加载其他qml文件，此时需要将sourceComponent修改为source属性值输入qml文件名称

**如：**

|  |  |
| --- | --- |
| **//main.qml**  import QtQuick 2.15  import QtQuick.Window 2.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  Component.onCompleted: *console*.log("finished....")//window 本身就有一个Component  Component.onDestruction: *console*.log("deconstrution...")  Loader{  source: "./CustomRect.qml" //可以使用Loader直接加载qml文件里面的组件  }  } | **//CustomRect.qml**  import QtQuick 2.0  Rectangle {  id:*borderRect*  width: 300  height: 300  property int myTopMargin:0  property int myBottomMargin:0  color: "purple"  Rectangle{  id:*innerRect*  color: "green"  anchors.fill: *parent*  anchors.topMargin: *myTopMargin*  anchors.leftMargin: 5  anchors.rightMargin: 5  anchors.bottomMargin:*myBottomMargin*  //state: "red\_color"  states: [  State {  name: "red\_color"  PropertyChanges {  target: *innerRect*;  color:"red"  }  },  State {  name: "blue\_color"  PropertyChanges {  target: *innerRect*;  color:"blue"  }  }  ]  MouseArea{  anchors.fill: *parent*  onPressed: {  *innerRect*.state = "red\_color"  }  onReleased: {  *innerRect*.state = "blue\_color"  }  }  }  } |

**运行效果**

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### 可以在自定义的组件里面添加onCompleted和onDestruction信号处理函数，然后在主调文件这里添加一个按钮来触发这个事件

**只需要在按钮的点击事件里面将Loader的source文件设置为“”。**

|  |  |
| --- | --- |
| **//main.qml**  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  // Component.onCompleted: console.log("finished....")//window 本身就有一个Component  // Component.onDestruction: console.log("deconstrution...")  // Item {  // id: item1  // width: 200  // height:200  // Component{  // id:redSquare  // Rectangle{  // color: "red"  // width: 100  // height: 100  // }  // }  //// Loader{ //Component需要Loader来加载，否则不会显示  //// sourceComponent: redSquare  //// }  // Loader{ //Component需要Loader来加载，否则不会显示,有多个Loader就加载多次  // sourceComponent: redSquare; x:100  // }  // }  Loader{  id:*ldr*  source: "./CustomRect.qml" //可以使用Loader直接加载qml文件里面的组件  }  Button{ //需要import QtQuick.Controls 2.15  width: 100  height: 60  x:300  onClicked: {  *ldr*.source = ""//卸载组件，会引发组件的onDestruction信号处理函数  }  text: "卸载"  }  } | **//CustomRect.qml**  import QtQuick 2.0  Rectangle {  id:*borderRect*  width: 300  height: 300  property int myTopMargin:0  property int myBottomMargin:0  color: "purple"  Rectangle{  id:*innerRect*  color: "green"  anchors.fill: *parent*  anchors.topMargin: *myTopMargin*  anchors.leftMargin: 5  anchors.rightMargin: 5  anchors.bottomMargin:*myBottomMargin*  //state: "red\_color"  states: [  State {  name: "red\_color"  PropertyChanges {  target: *innerRect*;  color:"red"  }  },  State {  name: "blue\_color"  PropertyChanges {  target: *innerRect*;  color:"blue"  }  }  ]  MouseArea{  anchors.fill: *parent*  onPressed: {  *innerRect*.state = "red\_color"  }  onReleased: {  *innerRect*.state = "blue\_color"  }  }  Component.onCompleted: *console*.log("finished....")//window 本身就有一个Component  Component.onDestruction: *console*.log("destrution...")  }  } |

**效果**

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### 注意:Loader有一个item属性可以获取它组件的组件，通过修改这个item的属性，就可以改变Loader加载的组件的属性

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**Loader还有一个异步属性，当需要加载的资源很大的时候非常有用**

## 5.如何在窗体中显示图像

**使用Image元素，显示gif动画，使用AnimatedImage元素**

**当然也可以把这些元素放到Component里面，然后使用Loader来加载，这样子比较麻烦**

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| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  // Component.onCompleted: console.log("finished....")//window 本身就有一个Component  // Component.onDestruction: console.log("deconstrution...")  // Item {  // id: item1  // width: 200  // height:200  // Component{  // id:redSquare  // Rectangle{  // color: "red"  // width: 100  // height: 100  // }  // }  //// Loader{ //Component需要Loader来加载，否则不会显示  //// sourceComponent: redSquare  //// }  // Loader{ //Component需要Loader来加载，否则不会显示,有多个Loader就加载多次  // sourceComponent: redSquare; x:100  // }  // }  // Loader{  // id:ldr  // source: "./CustomRect.qml" //可以使用Loader直接加载qml文件里面的组件  // asynchronous: true //异步加载。当组件非常大的时候有用  // onStatusChanged: console.log("Status=",status)  // }  // Button{ //需要import QtQuick.Controls 2.15  // width: 100  // height: 60  // x:300  // onClicked: {  // ldr.source = ""//卸载组件，会引发组件的onDestruction信号处理函数  // }  // text: "卸载"  // }  // Component{  // id:picbox  // Image{  // source:"./nicescn.jpg"  // }  // }  // Loader{  // sourceComponent: picbox  // }  // Image{  // source:"./nicescn.jpg"  // x:0  // y:0  // width:100  // height:100  // PropertyAnimation on width{  // to:350  // duration: 2000  // }  // PropertyAnimation on height{  // to:350  // duration: 2000  // }  // PropertyAnimation on x {  // to:150  // duration: 2000  // }  // PropertyAnimation on y {  // to:50  // duration: 2000  // }  // }  AnimatedImage{ //用来显示gif动画  id:*ami*  source:"./dogcr.gif"  x:0  y:0  width:100  height:100  PropertyAnimation on width{  to:350  duration: 2000  }  PropertyAnimation on height{  to:350  duration: 2000  }  PropertyAnimation on x {  to:150  duration: 2000  }  PropertyAnimation on y {  to:50  duration: 2000  }  }  Button{ //按钮控件没有color属性，如果想设置按钮的颜色，可以在按钮中嵌套一个矩形，用形填充整个按钮，修改矩形的颜色也就修改了按钮的颜色  id:*btn2*  x:100  y:370  onClicked: {  *ami*.paused = !*ami*.paused  }  Rectangle{  anchors.fill: *parent*  color:"yellow"  Text{  anchors.centerIn: *parent*  text:*qsTr*("play/stop")  color:"blue"  }  }  }  } |  |

## 6.MouseArea，可以接收鼠标点击。默认的接收按钮是左键，不过可以修改。

### 6.1基本使用

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**注意：在qml再MouseArea有onClicked事件，onPressed事件和onReleased事件**

**其中 onClicked = onPressed和onReleased事件的组合，需要如果只需要捕捉鼠标按下事件使用onPressed事件，**

**如果只需要捕捉鼠标弹起事件使用onReleased事件，onClicked只有当这两个事件都触发了才会触发**

### 6.2在MouseArea的按钮按下事件中判断是鼠标那个键按下

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| --- |
| MouseArea{  width: 100  height: 100  x:500  y:350  Rectangle{  anchors.fill: *parent*  color: "green"  }  //设置MouseArea接收左中右键的按下和弹起事件  acceptedButtons: *Qt*.LeftButton|*Qt*.RightButton|*Qt*.MidButton  onPressed:{  if(*pressedButtons* & *Qt*.LeftButton)  {  *console*.log("left button Pressed....")  }  else if(*pressedButtons* & *Qt*.RightButton)  {  *console*.log("Right button Pressed....")  } else if(*pressedButtons* & *Qt*.MidButton){  *console*.log("Middle button Pressed....")  }  }  onReleased: *console*.log("Released...")  } |

### 也可以像下面这么写

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### mouseX 和 mouseY属性

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### pressAndHold属性触发onPressAndHold事件

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### 事件冒泡？

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## 7.按钮控件QML Button：注意需要import QtQuick.Controls 2.15

### 有一个非常坑的地方：如果使用button的icon属性设置按钮的图片并不能显示，这是显示一个黑区域，

**设置图片需要用到**indicator属性

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| --- |
| Button{  id:*btn1*  width: 100  height: 50  checkable: true  autoExclusive: true //保证统一时刻一组按钮只有一个被选中  onDownChanged: {  *console*.log("down:",*down*,"pressed",*pressed*)  }  indicator: Image{  source: "./icon1.png"  }  } |

|  |
| --- |
|  |

### 其实可以不用icon和indicator来设置图片样式等等，因为Button控件有一个background属性可以设置这些

|  |
| --- |
| Button{  id:*btn2*  x:120  width: 100  height: 50  checkable: true  autoExclusive: true  background: Rectangle{  anchors.fill: *btn2*  color:{  if(*btn2*.pressed){  return "gray"  } else{  return "lightgreen"  }  }  border.color: *btn2*.pressed? "red" :"yellow"  }  } |

### Button扩展

#### 1.CheckBox

注意：CheckBox有一个叫做autoExclusive，它是从Button继承而来，对button有用对CheckBox没有用，因为CheckBox是多选按钮

如果非得要将其设置为排他的话可以使用ButtonGroup

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  ButtonGroup{  exclusive: true  buttons: *row2*.children  }  Row{  id:*row2*  CheckBox{  checked: true  //tristate: true //设置按钮为三态按钮  text: *qsTr*("学习")  onCheckStateChanged: {  *console*.log("checkState",*checkState*)  }  }  CheckBox{  text: *qsTr*("吃饭")  }  CheckBox{  //checked: true  text: *qsTr*("打游戏")  }  }  } |  |

**可以利用几个CheckBox和一个ButtonGroup实现父CheckBox的三态的效果，如子项全部选中，父项就是选中，如果有一个没有选中，父项是半选中状态，**

**如果全部都没有选中，父项为非选中状态，另一方面，选中父项就会选中所有子项，取消选中父项就会取消选中所有子项**

**实例：**

|  |  |
| --- | --- |
| **//main.qml**  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  Column{  ButtonGroup{  id:*childGroup*  exclusive: false  buttons: row2.children  checkState: *parentBox*.checkState  }  CheckBox{  id:*parentBox*  text: *qsTr*("Parent")  checkState: *childGroup*.checkState  }  CheckBox{  checked: true  text: *qsTr*("Child1")  leftPadding: *indicator*.width  ButtonGroup.group:*childGroup*  }  CheckBox{  text: *qsTr*("Child2")  leftPadding: *indicator*.width  ButtonGroup.group:*childGroup*  }  }  } |  |

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#### 2. DelayButton

用的不多，需要一直按住才会有进度条的效果

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| --- |
| DelayButton{  width: 180  height: 60  delay: 3000  onProgressChanged: {  *console*.log("operation in progress...")  }  } |

#### 3.RadioButton

默认就有排他功能因为这是一个单选按钮，不过需要把它们放在同一个父容器中

|  |  |
| --- | --- |
| ColumnLayout{ //需要import QtQuick.layouts2.15  RadioButton{  text: *qsTr*("c++")  checked: true  }  RadioButton{  text: *qsTr*("java")  }  RadioButton{  text: *qsTr*("python")  }  } |  |

如果想知道用户点击了那个RadioButton，需要RadioButton所在的容器和ButtonGroup配合工作

如：

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ButtonGroup{  id:*btngrp*  buttons: *col*.children  onClicked: {  if(*rd1*.checked){  *console*.log("radio1 checked...")  } else if(*rd2*.checked){  *console*.log("radio2 checked...")  } else if(*rd3*.checked){  *console*.log("radio3 checked...")  }  }  }  Column{  id:*col*  RadioButton{  id:*rd1*  checked:true  text: *qsTr*("c++")  }  RadioButton{  id:*rd2*  checked:false  text: *qsTr*("java")  }  RadioButton{  id:*rd3*  checked:false  text: *qsTr*("python")  }  }  } |  |

#### 4.开关按钮Switch

**默认自动排他没有效果，如果有这个需要，必须使用ButtonGroup来实现**

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ButtonGroup{  id:*btngrp*  buttons: *col*.children  exclusive: true  }  Switch{  text: *qsTr*("wifi")  onPositionChanged: {  *console*.log("position:",*position*)  }  onVisualPositionChanged: {  *console*.log("Visual position:",*visualPosition*)  }  }  Switch{  text: *qsTr*("bluetooth")  }  }  } |  |

#### 5，TabButton，使用的比较多

**TabButton必须和TabBar一起使用。**

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  TabBar{  TabButton{  text: *qsTr*("Home")  width:50;height:50  }  TabButton{  width:50;height:50  text: *qsTr*("Discover")  }  TabButton{  width:50;height:50  text: *qsTr*("Activity")  }  }  } |  |

#### 6.RoundButton

**跟一般的按钮没有什么大的区别，只不过它默认是圆的，可以修改radius属性将其变为圆角矩形**

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  RoundButton{  text: *qsTr*("hello")  onPressed: {  *console*.log("hello pressed...")  }  radius: 10  }  } |  |

#### 7.ToolButton

**需要在ToolBar里面使用，可以修改文本颜色**

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ToolBar{  RowLayout{  anchors.fill: *parent*  ToolButton{  palette.buttonText: "red"  text: *qsTr*("<")  onClicked: {  *console*.log("<<<<<<<<<<<<<<<<<<<")  }  }  Label{  palette.windowText: "green"  text: *qsTr*("title")  elide: Label.ElideRight  horizontalAlignment: *Qt*.AlignHCenter  verticalAlignment: *Qt*.AlignVCenter  Layout.fillWidth: true  }  ToolButton{  palette.buttonText: "purple"  text: *qsTr*("\*")  onClicked: {  *console*.log("\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*")  }  }  }  }  } |  |

#### 8.Button的contentItem属性，它可以是文本，Rectangle等等

**如果是Text，可以用它来设置按钮的字体大小，颜色，斜体，粗体**

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  Button{  id:*btn*  text: *qsTr*("MyBtn")  width: 100  height: 60  background:Rectangle{  anchors.fill: *parent*  color: "steelblue"  }  contentItem: Text { //contentItem还可以是Rectangle,主要是修改按钮内容的属性  id: *name*  text: *btn*.text  color: "purple"  font.pixelSize:18  font.bold: true  font.italic: true  horizontalAlignment: *Qt*.AlignHCenter  verticalAlignment: *Qt*.AlignVCenter  }  }} |  |

**还可以这样子：将contentItem改为Rectangle，在rectangle里面放置文本和图片**

|  |  |
| --- | --- |
| **//main.qml**  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  Button{  id:*btn*  text: *qsTr*("MyBtn")  width: 100  height: 60  // background:Rectangle{  // anchors.fill: parent  // color: "steelblue"  // }  contentItem: Rectangle { //contentItem还可以是Rectangle,主要是修改按钮内容的属性  anchors.fill: *parent*  color: "lime"  Text {  id: *txt*  text: *btn*.text  color: "purple"  font.pixelSize:18  font.bold: true  font.italic: true  y:*parent*.height/3  }  Image {  id: *img*  source: "./icon1.png"  width: 30  height: 20  anchors.left: *txt*.right  anchors.bottom: *txt*.bottom  }  }  }  } |  |

## 8.Property的使用

### 8.1 可以在一个元素中使用property关键字来设置自定义属性

格式：property 类型 属性名称：值，如：property int myTopMargin:0，类型是默认支持的类型可以是string，real（代替double和float），color等等其他属性也可以

定义好后，就可以像使用内置的属性一样使用

|  |
| --- |
| Rectangle{  x:350  width: 100  height: 50  property string strColor: "purple"  property color kcolor: *strColor*  color:*kcolor*  } |

|  |
| --- |
|  |

注意：这些设置好的属性只能作为属性值，而不是属性名，如kcolor就只能放在冒号的右边，否则会报错

#### 可以使用property设置Component属性来实现动态加载组件的功能，如

property Component myComponent 注意不要赋值，这个需要外部传入，注意需要Loader。

在使用的地方创建一个组件，起一个id号，将这个id号传入需要的地方，见main.qml

|  |  |  |  |
| --- | --- | --- | --- |
|  | //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  Component{  id:*com*  Rectangle{  width: 100  height: 50  color: "yellow"  }  }  MyRect{  myComponent: *com*    }  } | //MyRect.qml 首字母要大写，否则报错  import QtQuick 2.0  Rectangle{  property Component myComponent  property var myVar  property list<Rectangle> rectList  width: 300  height: 200  color: "pink"  Loader{  sourceComponent: *myComponent*  }  } |  |

### 8.2property的特殊用法

**注意：这个类型可以是上面的类型，还可以是一个很特殊的类型var，还可以是一个泛型list，如：property list<Rectangle> rectList**

**此外，可以在property关键字前面加readonly修饰符来设置一个只读属性。还可以在property前面添加required修饰符，表示这个属性必须设置，否则程序无法运行**

**如：**required property Component myComponent

property关键字还有一个作用：给一个组件的子组件起一个别名以供外部使用（默认情况下外部不能够直接使用一个控件的子控件）

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  Component{  id:*com*  Rectangle{  //这里不要设置,否则下面设置无效  //width: 100  // height: 50  //color: "yellow"  }  }  MyRect{  myComponent: *com*  Component.onCompleted: {  *console*.log("width:",*rectWidth*)  //innerColor = "orange"  *inner*.color = "orange"  *inner*.width = 150  *inner*.height = 100  }  }  } | //MyRect.qml 首字母要大写，否则报错  Rectangle{  id:*borderRect*  width: 300  height: 200  required property Component myComponent  property var myVar  property list<Rectangle> rectList  readonly property int rectWidth: *width*  property alias inner: *innerRect*  //property alias innerColor: innerRect.color //可以只给子组件的一个属性起别名，这样子外部就只能够操作这个属性  color: "pink"  Rectangle{  id:*innerRect*  Loader{  sourceComponent: *myComponent*  }  }  } |

## 9.Text元素

text元素设置宽高没有作用，需要设置的是contentWidth和contentHeight

text元素有一个elide属性也就是省略属性，当设置为true时，可以将过长的文本用省略号代替，实例1（截屏）

|  |
| --- |
|  |

实例2，可以设置Text的样式，有Normal ,Outline,Raised,Sunken四种样式

|  |  |
| --- | --- |
| Text {  id: *txt1*  x:50  y:20  color: "steelblue"  font.pointSize: 24  font.bold: true  font.letterSpacing: 10  font.underline: true  font.family: "华文行楷"  text: *qsTr*("i love girls\ni love girls\ni love girls")  Component.onCompleted: {  *console*.log("contentWidth:",*contentWidth*)  *console*.log("contentHeight:",*contentHeight*)  *console*.log("lineCount:",*lineCount*)  *console*.log("lineHeight:",*lineHeight*)  }  }  Row {  x:10  y:140  Text { font.pointSize: 24; text: "Normal" }  Text { font.pointSize: 24; text: "Raised"; style: Text.Raised; styleColor: "lime" }  Text { font.pointSize: 24; text: "Outline";style: Text.Outline; styleColor: "red" }  Text { font.pointSize: 24; text: "Sunken"; style: Text.Sunken; styleColor: "yellow" }  } |  |

还可以设置Text组件的文本格式，有**Text.AutoText,Text.PlainText,Text.StyledText,Text.RichText,Text.MarkdownTex**t五种，默认是AutoText

**Text.StyledText 支持如下标签**

**<b></b> - bold**

**<del></del> - strike out (removed content)**

**<s></s> - strike out (no longer accurate or no longer relevant content)**

**<strong></strong> - bold**

**<i></i> - italic**

**<br> - new line**

**<p> - paragraph**

**<u> - underlined text**

**<font color="color\_name" size="1-7"></font>**

**<h1> to <h6> - headers**

**<a href=""> - anchor**

**<img src="" align="top,middle,bottom" width="" height=""> - inline images**

**<ol type="">, <ul type=""> and <li> - ordered and unordered lists**

**<pre></pre> - preformatted**

**&gt; &lt; &amp;**

实例3

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  Column{  Text {  font.pointSize: 24  text: "<b>Hello</b> <i>World!</i> Auto"  }  Text {  font.pointSize: 24  textFormat: Text.RichText  text: "<b>Hello</b> <i>World!</i> Rich"  }  Text {  font.pointSize: 24  textFormat: Text.StyledText  text: "<b>Hello</b> <i>World!</i> Styled"  }  Text {  font.pointSize: 24  textFormat: Text.PlainText  text: "<b>Hello</b> <i>World!</i> Plain"  }  Text {  font.pointSize: 24  textFormat: Text.MarkdownText  // text: "<b>Hello</b> <i>World!</i>"  text: "\*\*Hello\*\* \*World!\*"  }  }  } |  |

**还可以设置wrapMode。wrapMode的值可以是Text.NoWrap (default) ,Text.WordWrap ,Text.WrapAnywhere ,Text.Wrap默认值是noWrap，可以设置它自动换行**

最常用的是**Text.WordWrap或者Text.NoWrap**

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")    Rectangle{  id:*rec*  width: 180  height: 100  border.color: pink  color: "green"  Text {  font.pointSize: 16  text: "Hello Hello Hello Hello Hello Hello "  wrapMode: Text.WordWrap //以一个词为分割单位  anchors.fill: *parent*  }  }  } |  |

**linkActivated，可以处理超链接**

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")    Text {  textFormat: Text.RichText  text: "See the <a href=\"http://qt-project.org\">Qt Project website</a>."  onLinkActivated: *console*.log(*link* + " link activated")  onLinkHovered: *console*.log("hovered",*link*)  onHoveredLinkChanged: *console*.log("hover link changed",*hoveredLink*) //的鼠标从超链接处移开时触发  }  } |  |

如果想要实现点击超链接后打开指定的网页，可以使用*Qt*.openUrlExternally(*link*)

如：

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")    Text {  textFormat: Text.RichText  text: "See the <a href=\"http://qt-project.org\">Qt Project website</a>."  onLinkActivated: *Qt*.openUrlExternally(*link*) //打开链接对应的页面  onLinkHovered: *console*.log("hovered",*link*)  onHoveredLinkChanged: *console*.log("hover link changed",*hoveredLink*) //的鼠标从超链接处移开时触发  }  } | 点击链接后，打开了网页 |

如果需要点击链接的时候同时改变链接的颜色，需要使用Text.StyledText格式，修改linkColor属性的颜色，还可以给鼠标在链接悬停的状态设置另一个颜色：

使用Text.RichText需要配合css

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")    Text {  //textFormat: Text.RichText  textFormat: Text.StyledText  text: "See the <a href=\"http://qt-project.org\">Qt Project website</a>."  onLinkActivated:{  *Qt*.openUrlExternally(*link*)  *linkColor*= "purple"  }  onLinkHovered: onLinkHovered: *linkColor*="orange" onHoveredLinkChanged: *console*.log("hover link changed",*hoveredLink*) //的鼠标从超链接处移开时触发  }  } | 点击前    悬停状态：    点击后：打开网页，链接变色 |

注意qml中有一个叫做属性绑定的概念，如label.text: "space pressed :" + *spacePresses* + " times"

也就是直接将属性值和一个数值通过+号连接起来

这种绑定有一个不好的地方，就是如果此时你修改了这个属性值，绑定就失效了。

比较好的方法是使用赋值方式替代绑定方式，就像下列中的写法2

|  |  |
| --- | --- |
| import QtQuick 2.15  import QtQuick.Window 2.15  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  //写法1  // Text {  // id: label  // x: 24;y: 24  // property int spacePresses: 0  // text: "space pressed :" + spacePresses + "times" //这是属性绑定  // onTextChanged: console.log("text changed to ",text)  // focus: true  // Keys.onSpacePressed: increment()  // // Keys.onEscapePressed: label.text=''//注意如果此时将文本的值修改，那么将会销毁上面的协议，按空格键将不起作用  // Keys.onEscapePressed: spacePresses =0  // //Keys.onEnterPressed: spacePresses = 100 //没有作用  // function increment(){  // spacePresses++  // }  // }  //写法2，较好  Text {  id: *label*  x: 24;y: 24  property int spacePresses: 0  text:"space pressed :0 times"  onTextChanged: *console*.log("text changed to ",*text*)  focus: true  Keys.onSpacePressed: *increment*()  Keys.onEscapePressed: *label*.text="space pressed :0 times"  function *increment*(){  *spacePresses*++  *label*.text = "space pressed :" + *spacePresses* + " times" ;//使用赋值来修改属性值比直接绑定属性值好，也就是"="代替":"  }  }  } | 按空格键    按esc键 |

## 10、popup元素

popup元素的默认他的visible属性是false，也就是默认不显示。如果需要显示可以有几种方法1.直接将他的visible属性设置为true。2.在window的Component.onCompleted事件中调用

popup.open()方法。3.在按钮的点击事件中调用popup.open()方法或者popup.visible = true.

|  |  |
| --- | --- |
| import QtQuick 2.15  import QtQuick.Window 2.15  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  Component.onCompleted: {  //popup.open()  *popup*.visible = true  }  Popup{  id:*popup*  width:300  height: 200  //visible: true  }  } |  |

popup的外观很像Rectangle。

也可以调用popup.close()方法来关闭一个popup

#### 注意：1.在qml中如果父控件的visible属性为false，即使子控件的visible属性为true，父子控件都不会显示，但是popup是例外的：

**实例，对比两种情况**

|  |  |
| --- | --- |
| import QtQuick 2.15  import QtQuick.Window 2.15  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  Rectangle{  width: 200  height:100  color: "pink"    Popup{  id:*popup*  width:80  height: 40  visible: true  }  }  } | import QtQuick 2.15  import QtQuick.Window 2.15  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  Rectangle{  width: 200  height:100  color: "pink"  visible: false  Popup{  id:*popup*  width:80  height: 40  visible: true  }  }  } |
| **效果** | **效果** |

#### 2.一般来说，当两个qml元素互相遮挡的时候，z值大的会覆盖z值小的元素，但是popup又是一个例外，popup总是在最上面，即使你将他的z值设置为负数，也没有用

**实例**

|  |  |
| --- | --- |
| import QtQuick 2.15  import QtQuick.Window 2.15  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  Rectangle{  width: 200  height:100  color: "pink"  //z:0  }  Popup{  id:*popup*  width:200  x:100  height: 100  visible: true  //z:-1  }  **}** | import QtQuick 2.15  import QtQuick.Window 2.15  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  Rectangle{  width: 200  height:100  color: "pink"  z:10  }  Popup{  id:*popup*  width:200  x:100  height: 100  visible: true  z:-1  } |
|  |  |

#### 实际上，popup的z值只有当两个popup互相遮挡的时候才有意义，z值大的popup覆盖z小的popup。其他情况z不起作用，都是popup覆盖其他元素

#### Popup还有modal，focus和closePolicy等等属性

|  |
| --- |
| Popup{  id:*popup*  width:200  x:100  height: 100  visible: true  z:-1  modal: true  focus: true//设置为可以获取输入焦点  closePolicy: Popup.CloseOnEscape|Popup.CloseOnReleaseOutsideParent  } |

#### 还可以将Popup的closePolicy设置为：NoAutoClose，此时按下esc键或者点击父窗体Popup不会关闭

#### 还有一个dims属性，控制非模态方式显示Popup时父窗体的颜色

#### enter和exit，可以在这两个属性在设置过渡效果，让透明度从0到1和透明度从1到0

例子，利用按钮控制Popup的显示隐藏并且显示过渡效果

|  |  |
| --- | --- |
| import QtQuick 2.15  import QtQuick.Window 2.15  Window {  width: 640  height: 480  visible: true  title: *qsTr*("Hello World")  Button{  anchors.centerIn: *parent*  width: 100  height: 50  background:Rectangle {  color: "orange"  Text {  id: *txt*  text: *qsTr*("show/hide")  anchors.centerIn: *parent*  }  }  onClicked: *popup*.visible = !*popup*.visible  }  Popup{  id:*popup*  width:200  x:100  height: 100  visible: true  z:-1  focus: true  closePolicy: Popup.CloseOnEscape|Popup.CloseOnReleaseOutsideParent  enter: Transition {  NumberAnimation { property: "opacity"; from: 0.0; to: 1.0 ;duration: 1000}  }  exit: Transition {  NumberAnimation { property: "opacity"; from: 1.0; to: 0.0; duration: 1000 }  }  }  } | 点击按钮之前：    点击一次，隐藏    再点击一次，又显示，一直点击一直交替。。。。 |

#### Popup也有contentItem，可以在里面设置文本，背景等等

如：

|  |  |
| --- | --- |
| import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  Button{  anchors.centerIn: *parent*  width: 100  height: 50  background:Rectangle {  color: "orange"  Text {  id: *txt*  text: *qsTr*("show/hide")  anchors.centerIn: *parent*  }  }  onClicked: *popup*.visible = !*popup*.visible  }  Popup{  id:*popup*  width:200  x:100  height: 100  visible: true  z:-1  focus: true  contentItem: Rectangle{  anchors.fill: *parent*  color: "deeppink"  Text {  id: *txt1*  text: *qsTr*("i am popup")  anchors.centerIn: *parent*  }  }  closePolicy: Popup.CloseOnEscape|Popup.CloseOnReleaseOutsideParent  enter: Transition {  NumberAnimation { property: "opacity"; from: 0.0; to: 1.0;duration: 1000}  }  exit: Transition {  NumberAnimation { property: "opacity"; from: 1.0; to: 0.0 ;duration: 500}  }  }  } |  |

overlay属性参考qt assit

## 11.Repeater

#### 用于绘制n个完全相同的元素，以下是基本使用，model可以是常数，也可以是list，下面是常数，表示一共绘制第三个控件

|  |  |
| --- | --- |
| Row{  Repeater{  model: 4  Rectangle{  width: 120  height: 60  color: "deeppink"  border.color: "yellow"  }  }  } |  |

#### Repeater 有一个index属性，可以利用这个属性乘于一个常数来调整控件的位置

|  |  |
| --- | --- |
| Repeater{  model: 4  Rectangle{  y:index\*70  width: 120  height: 60  color: "deeppink"  border.color: "yellow"  }  } |  |

#### 如果将model改为一个数组，在数组里面放置不同的控件名称可以一次创建几个不同的控件，数组的长度是创建的个数，数组元素是创建的类型

|  |  |
| --- | --- |
| Repeater{  model: ["Button","Rectangle","MouseArea"] //数量还是3，他会计算数组的长度  Rectangle{  y:index\*70  width: 120  height: 60  color: "deeppink"  border.color: "yellow"  Text {  text: modelData  }  }  } |  |

## 12.ListView

#### ListView是一个使用频率非常高的组件，最简单的用法

|  |  |
| --- | --- |
| import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ListView{  width: 100  height: 100  model:3  delegate: Text{  text:index  }  }  } |  |

#### delegate可以是任何类型如Rectangle，spacing属性可以控制列表项的间隔

|  |  |
| --- | --- |
| import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ListView{  width: 100  height: 100  model:3 //model可以是数字  delegate: Rectangle{  width: 100  height: 30  spacing: 5 //设置一个列表项的间隔  border.color: "deeppink"  color:"yellow"  Text {  text: "Rect"+index  }  }  }  } |  |

#### model还可以是一个数组

|  |  |
| --- | --- |
| import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ListView{  width: 100  height: 100  spacing: 5 //设置一个列表项的间隔  model: ["Button","Rectangle","MouseArea"]  delegate: Rectangle{  x:10  width: 100  height: 30  border.color: "deeppink"  color:"yellow"  Text {  text:modelData  anchors.centerIn: *parent*  }  }  } |  |

#### ListView需要一个数据模型：ListModel，在数据模型里面放置ListElement元素，每一个元素有自己的属性

实例1

|  |  |
| --- | --- |
| import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ListModel{  id:*data*  ListElement{  name:"Jack"  number:13532788888  }  ListElement{  name:"Mary"  number:13532766666  }  ListElement{  name:"Jack"  number:13533788555  }  }  ListView{  width: 200  height: 320  model:*data*  delegate: Text {  text: name + " " + number  }  }  } |  |

#### 当然也可以将ListModel放到例外一个qml文件，在ListView的model属性中加载该文件

|  |  |  |
| --- | --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ListView{  width: 200  height: 100  model: ContactModel{}//一个qml文件就是一个组件  delegate: Text { //绘制数据  text: name+ " " +number + " "+ email  }  }  } | //ContactModel.qml //数据文件  import QtQuick 2.15  import QtQuick.Controls 2.15  ListModel {  ListElement {  name: "Bill Smith"  number: "555 3264"  email:"Bill123@gmail.com"  }  ListElement {  name: "John Brown"  number: "555 8426"  email:"Johnb@yahoo.com"  }  ListElement {  name: "Sam Wise"  number: "555 0473"  email:"Sam123@outlook.com"  }  } |  |

#### 可以设置ListView的高亮highlight属性，可以通过键盘的上下方向键来移动列表项，被选中的会高亮显示，注意必须就列表项的颜色设置为透明

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ListView{  width: 100  height: 100  spacing: 5 //设置一个列表项的间隔  highlight: Rectangle{color:"orange";radius: 8} //必须要将元素的颜色设置为透明否则效果不好  focus: true  model: ["Button","Rectangle","MouseArea"]  delegate: Rectangle{  x:10  width: 100  height: 30  //border.color: "deeppink"  color:"transparent"  Text {  text:modelData  anchors.centerIn: *parent*  }  }  }  } |  |

#### ListView有一个currentIndex属性它代表当前选中的对象，可以index属性一起使用配合MouseArea实现点击列表项高亮显示的效果

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ListView{  id:*lv*  width: 100  height: 100  spacing: 5 //设置一个列表项的间隔  highlight: Rectangle{x:10;color:"orange";radius: 8} //必须要将元素的颜色设置为透明否则效果不好  focus: true  model: ["Button","Rectangle","MouseArea"]  delegate: Rectangle{  x:10  width: 100  height: 30  //border.color: "deeppink"  color:"transparent"  Text {  text:modelData  anchors.centerIn: *parent*  }  MouseArea{ //实现点击改变高亮的效果  anchors.fill: *parent*  onClicked: {*lv*.currentIndex = index}  }  }  }  } |  |

#### 还可以为ListView添加header和footer

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  Rectangle{  //anchors.centerIn: parent  border.color:"yellow"  ListView{  id:*lv*  width: 100  height: 100  spacing: 5 //设置一个列表项的间隔  header:Rectangle{  x:10;  color:"lightsteelblue";  width:*parent*.width;  height: 10  }  footer:Rectangle{  x:10;  color:"lightsteelblue";  width:*parent*.width;  height: 10  }  highlight: Rectangle{x:10;color:"orange";radius: 8} //必须要将元素的颜色设置为透明否则效果不好  focus: true  model: ["Button","Rectangle","MouseArea"]  delegate: Rectangle{  x:10  width: 100  height: 30  //border.color: "deeppink"  color:"transparent"  border.color: "yellow"  Text {  text:modelData  anchors.centerIn: *parent*  }  MouseArea{ //实现点击改变高亮的效果  anchors.fill: *parent*  onClicked: {*lv*.currentIndex = index}  }  }  }  }  } |  |

#### 利用ListView的section属性属性列表项分类显示，比较复杂

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ListModel{  id:*animalsModel*  ListElement{  name:"Parrot"  size:"Small"  }  ListElement{  name:"Guinea pig"  size:"Small"  }  ListElement{  name:"Dog"  size:"Medium"  }  ListElement{  name:"Cat"  size:"Medium"  }  ListElement{  name:"Cow"  size:"Large"  }  ListElement{  name:"Elephant"  size:"Large"  }  }  // The delegate for each section header  Component {  id: *sectionHeading*  Rectangle {  width: 300  height: *childrenRect*.height  color: "lightsteelblue"  required property string section  Text {  text: *parent*.section  font.bold: true  font.pixelSize: 20  }  }  }  ListView {  id: *view*  anchors.top: *parent*.top  width: 300  height: 300  model: *animalsModel*  delegate: Text {  required property string name  text: *name*  font.pixelSize: 18  }  section.property: "size"  section.criteria: ViewSection.FullString  section.delegate: *sectionHeading*  }  } |  |

## 13 ComboBox

#### 最简单的ComboBox实例如下，model是一个数字

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ComboBox{  model:3  }  } |  |

#### model也可以是一个数组

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ComboBox{  model: model:["Button","Rectangl","MouseArea"]  }  } |  |

#### 可以编辑的ComboBox

需要将editable属性设置为true，而且需要在onAccepted事件中添加代码

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  //可以编辑的ComboBox  ComboBox{  id:*cbx*  editable: true  model:ListModel{  id:*listMod*  ListElement{text:"apple"}  ListElement{text:"banana"}  ListElement{text:"pineapple"}  }  onAccepted: {//这个的作用是将编辑框中的内容添加到ComboBox的列表项，  if(*find*(*editText*)===-1) //先在列表项在查找文本，没有才添加不要重复添加  {  *listMod*.append({text:*editText*})  }  }  }  } | 编辑前    编辑并且按回车确认后： |

#### currentIndex可以修改当前选中项，currentValue是当前列表项的值是一个只读属性

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  //可以编辑的ComboBox  ComboBox{  id:*cbx*  editable: true  currentIndex:1  model:ListModel{  id:*listMod*  ListElement{text:"apple"}  ListElement{text:"banana"}  ListElement{text:"pineapple"}  }  Component.onCompleted: *console*.log(*currentValue*)//currentValue是一个只读属性  onAccepted: {//这个的作用是将编辑框中的内容添加到ComboBox的列表项，  if(*find*(*editText*)===-1) //先在列表项在查找文本，没有才添加不要重复添加  {  *listMod*.append({text:*editText*})  }  }  }  } |  |

思考：currentValue和currentText有什么区别？

当ComboBox的列表项只有一个值并且是string的情况下两者是一样的。如果有两个值，

currentValue是指当前项的valueRole指定的子项的值，currentText是指当前项的textRole指定的子项的值

实例1

|  |  |
| --- | --- |
|  | 结果： |

实例2

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ComboBox {  textRole: "text"  valueRole: "value"  Component.onCompleted: {  *console*.log("currentText:",*currentText*)  *console*.log("currentValue:",*currentValue*)  }  model: [  { value: 100, text: *qsTr*("Enter") },  { value: 200, text: *qsTr*("Shift") },  { value: 300, text: *qsTr*("Control") }  ]  }  } |  |

实例3

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ComboBox {  textRole: "text"  valueRole: "title"  onCurrentTextChanged: {  *console*.log("currentText:",*currentText*)  }  onCurrentValueChanged: {  *console*.log("currentValue:",*currentValue*)  }  model: [  { value: 100, text: *qsTr*("Enter"),title:"first" },  { value: 200, text: *qsTr*("Shift") ,title:"second"},  { value: 300, text: *qsTr*("Control"),title:"third" }  ]  } |  |

#### ComboBox有一个displayText属性，可以修改列表项显示的内容：

实例4

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ComboBox {  textRole: "text"  valueRole: "title"  displayText: *currentText* +":" +*currentValue*  onCurrentTextChanged: {  *console*.log("currentText:",*currentText*)  }  onCurrentValueChanged: {  *console*.log("currentValue:",*currentValue*)  }  model: [  { value: 100, text: *qsTr*("Enter"),title:"first" },  { value: 200, text: *qsTr*("Shift") ,title:"second"},  { value: 300, text: *qsTr*("Control"),title:"third" }  ]  }  } |  |

#### ComboBox的验证器：可以限制输入，只允许输入符合条件的数值

如：整数验证器，只允许输入0-9的数字

|  |  |
| --- | --- |
| //main.qml  import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ComboBox {  model: 10  editable: true  validator: IntValidator { //整数验证器，只允许输入指定范围的数字  top: 9  bottom: 0  }  }  }  //注意，当你将top修改为20，你会发现即使你输入了99，也能接受，这是为什么？  //这是因为ComboBox有一个叫做acceptableInput的属性引起的。怎么解决？ |  |

正则表达式验证器

|  |
| --- |
|  |

#### 自定义绘制ComboBox

|  |  |  |
| --- | --- | --- |
| import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ComboBox {  id: *control*  model: ["First", "Second", "Third"]  delegate: ItemDelegate {//控制model中每一项的绘制  width: *control*.width  contentItem: Text {  text: modelData  // color: "#21be2b"  color: "orange" //修改列表项的颜色，可以使用%取模的方法实现一个ComboBox的列表项有不同颜色的效果  font: *control*.font  elide: Text.ElideRight  verticalAlignment: Text.AlignVCenter  }  highlighted: *control*.highlightedIndex === index  }  indicator: Canvas { //控制ComboBox右边的小箭头的绘制，可以不要  id: *canvas*  x: *control*.width - *width* - *control*.rightPadding  y: *control*.topPadding + (*control*.availableHeight - *height*) / 2  width: 12  height: 8  contextType: "2d"  Connections {  target: *control*  function onPressedChanged() { *canvas*.requestPaint(); }  }  onPaint: {  *context*.reset();  *context*.moveTo(0, 0);  *context*.lineTo(*width*, 0);  *context*.lineTo(*width* / 2, *height*);  *context*.closePath();  *context*.fillStyle = *control*.pressed ? "#17a81a" : "#21be2b";  *context*.fill();  }  }  contentItem: Text {  leftPadding: 0  rightPadding: *control*.indicator.width + *control*.spacing  text: *control*.displayText  font: *control*.font  color: *control*.pressed ? "#17a81a" : "#21be2b"  verticalAlignment: Text.AlignVCenter  elide: Text.ElideRight  }  background: Rectangle {//只会改变ComboBox的编辑框所在区域的背景  implicitWidth: 120  implicitHeight: 40  border.color: *control*.pressed ? "#17a81a" : "#21be2b"  border.width: *control*.visualFocus ? 2 : 1  radius: 2  }  popup: Popup {//修改ComboBox列表取的显示属性  y: *control*.height - 1 //控制ComboBox的下拉控件的显示位置当设置的太大，ComboBox会倒过来显示  width: *control*.width  implicitHeight: *contentItem*.implicitHeight  padding: 1  contentItem: ListView {  clip: true  implicitHeight: *contentHeight*  model: *control*.popup.visible ? *control*.delegateModel : null  currentIndex: *control*.highlightedIndex  ScrollIndicator.vertical: ScrollIndicator { } //滚动条，可以改为ScrollBar  }  background: Rectangle {  border.color: "#21be2b"  radius: 2  }  }  }  } | |  | | --- | |  | |

|  |
| --- |
|  |

|  |
| --- |
|  |

#### 实现阴影效果

|  |  |
| --- | --- |
| import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  ComboBox {  id: *control*  model: ["First", "Second", "Third"]  delegate: ItemDelegate {//控制model中每一项的绘制  width: *control*.width  contentItem: Text {  text: modelData  // color: "#21be2b"  color: "orange" //修改列表项的颜色，可以使用%取模的方法实现一个ComboBox的列表项有不同颜色的效果  font: *control*.font  elide: Text.ElideRight  verticalAlignment: Text.AlignVCenter  layer.enabled: true  layer.effect: DropShadow{//增加阴影效果  horizontalOffset: 3  verticalOffset: 3  radius: 8.0  //radius: 0.0  samples: 17  //color: "#80000000"  color: "lightsteelblue"  }  }  highlighted: *control*.highlightedIndex === index  }  indicator: Canvas { //控制ComboBox右边的小箭头的绘制，可以不要  id: *canvas*  x: *control*.width - *width* - *control*.rightPadding  y: *control*.topPadding + (*control*.availableHeight - *height*) / 2  width: 12  height: 8  contextType: "2d"  Connections {  target: *control*  function onPressedChanged() { *canvas*.requestPaint(); }  }  onPaint: {  *context*.reset();  *context*.moveTo(0, 0);  *context*.lineTo(*width*, 0);  *context*.lineTo(*width* / 2, *height*);  *context*.closePath();  *context*.fillStyle = *control*.pressed ? "#17a81a" : "#21be2b";  *context*.fill();  }  }  contentItem: Text {  leftPadding: 0  rightPadding: *control*.indicator.width + *control*.spacing  text: *control*.displayText  font: *control*.font  color: *control*.pressed ? "#17a81a" : "#21be2b"  verticalAlignment: Text.AlignVCenter  elide: Text.ElideRight  }  background: Rectangle {//只会改变ComboBox的编辑框所在区域的背景  implicitWidth: 120  implicitHeight: 40  border.color: *control*.pressed ? "#17a81a" : "#21be2b"  border.width: *control*.visualFocus ? 2 : 1  radius: 2  }  popup: Popup {//修改ComboBox列表取的显示属性  y: *control*.height - 1 //控制ComboBox的下拉控件的显示位置当设置的太大，ComboBox会倒过来显示  width: *control*.width  implicitHeight: *contentItem*.implicitHeight  padding: 1  contentItem: ListView {  clip: true  implicitHeight: *contentHeight*  model: *control*.popup.visible ? *control*.delegateModel : null  currentIndex: *control*.highlightedIndex  ScrollIndicator.vertical: ScrollIndicator { } //滚动条，可以改为ScrollBar  }  background: Rectangle {  border.color: "#21be2b"  radius: 2  layer.enabled: true  layer.effect: DropShadow{//增加阴影效果  horizontalOffset: 3  verticalOffset: 3  radius: 8.0  //radius: 0.0  samples: 17  //color: "#80000000"  color: "lightgray"  }  }  }  }  } |  |

## 14 FocusScope

#### FocusScope简单使用

|  |  |
| --- | --- |
| import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  import QtGraphicalEffects 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  FocusScope{ //没有border属性,没有background属性  id:*fss*  TextInput{  id:*input*  focus: true  text: "focus " + *focus*+" "+"activeFocus " +*activeFocus*  }  }  FocusScope{ //没有border属性,没有background属性  id:*fss2*  y:100  TextInput{  id:*input2*  focus: true  text: "focus " + *focus*+" "+"activeFocus " +*activeFocus*  }  }  } |  |

#### 解决有多个控件同时有输入焦点或者焦点丢失的方法

|  |  |
| --- | --- |
| import QtQuick 2.15  import QtQuick.Window 2.15  import QtQuick.Controls 2.15  import QtQuick.Layouts 1.15  import QtGraphicalEffects 1.15  //Component 和Loader  Window {  width: 640  height: 480  visible: true  title: *qsTr*("My QML Demo")  FocusScope{ //没有border属性,没有background属性  id:*fss*  Button{  id:*btn1*  width: 100  height:50  focus: true  background: Rectangle{  anchors.fill: *parent*  color: *btn1*.activeFocus? "green":"gray"  }  }  }  FocusScope{ //没有border属性,没有background属性  id:*fss2*  y:100  Button{  id:*btn2*  width: 100  height:50  focus: false  focusPolicy:*Qt*.NoFocus  background: Rectangle{  anchors.fill: *parent*  color: *btn2*.activeFocus? "green":"gray"  }  onClicked: {  *btn2*.forceActiveFocus()//解决多焦点  }  }  }  } |  |