**Lab Exercise 7 – QML Widgets**

Creating widgets in QML is an essential part of building user interfaces in Qt Quick applications. Widgets in QML are components or elements that provide user interface elements like buttons, text inputs, labels, and more. In this tutorial, we'll cover the basics of creating and using widgets in QML.

**Prerequisites:**

Before you start, ensure you have Qt and Qt Creator installed. You can download Qt from the official website (https://www.qt.io/download).

**Step 1: Creating a Basic QML Application**

Open Qt Creator and create a new Qt Quick Application project.

In your project directory, locate the main.qml file. This is where we'll create our QML widgets.

**Step 2: Creating a Label Widget**

Let's start by creating a simple label widget.

import QtQuick 2.15

import QtQuick.Controls 2.15

ApplicationWindow {

visible: true

width: 400

height: 200

title: "Widget Example"

Label {

text: "Hello, QML Widgets!"

anchors.centerIn: parent

}

}

Here, we import the QtQuick.Controls module for creating widgets. We've added a Label widget with the text "Hello, QML Widgets!" centered within the window.

**Step 3: Running the Application**

Build and run your application. You should see a window displaying the label.

**Step 4: Creating a Button Widget**

Let's add a button widget that displays a message when clicked.

import QtQuick 2.15

import QtQuick.Controls 2.15

ApplicationWindow {

visible: true

width: 400

height: 200

title: "Widget Example"

Label {

text: "Hello, QML Widgets!"

anchors.centerIn: parent

}

Button {

text: "Click Me"

anchors.horizontalCenter: parent.horizontalCenter

anchors.top: label.bottom

onClicked: {

label.text = "Button Clicked!"

}

}

}

We added a Button widget with the text "Click Me" and a Label with the initial text. When the button is clicked, it changes the label's text.

**Step 5: Creating an Input Field (TextField) Widget**

Next, let's add an input field where users can enter text.

import QtQuick 2.15

import QtQuick.Controls 2.15

ApplicationWindow {

visible: true

width: 400

height: 200

title: "Widget Example"

Label {

text: "Hello, QML Widgets!"

anchors.centerIn: parent

}

Button {

text: "Click Me"

anchors.horizontalCenter: parent.horizontalCenter

anchors.top: label.bottom

onClicked: {

label.text = "Button Clicked!"

}

}

TextField {

placeholderText: "Enter text"

anchors.horizontalCenter: parent.horizontalCenter

anchors.top: button.bottom

onTextChanged: {

label.text = "You entered: " + text

}

}

}

We've added a TextField widget with a placeholder text "Enter text." When the text in the input field changes, it updates the label with "You entered: " followed by the entered text.

**Step 6: Running the Final Application**

Build and run your application again. You should now see a label, a button, and an input field.

This tutorial covers the basics of creating and using widgets in QML. You can explore more widgets and their properties in the Qt documentation (https://doc.qt.io/qt-5/qmltypes.html).