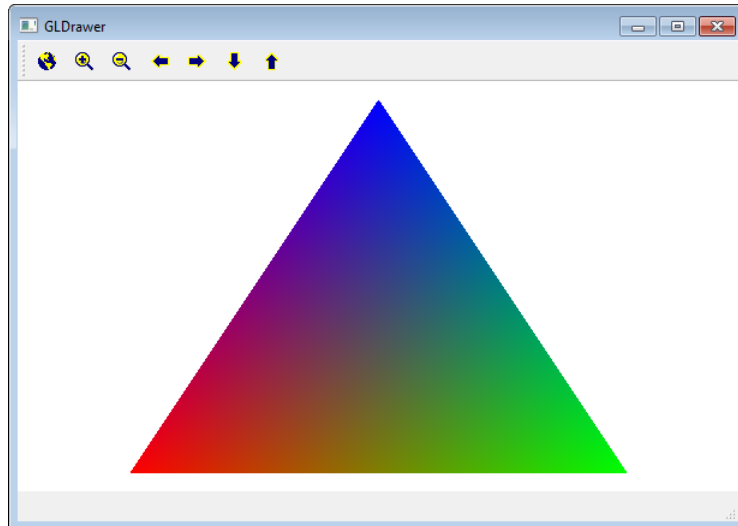


# Introduction to Computer Graphics for Engineering

Short Course - 16th -18th June 2014

## *Implementation of a simple graphics program with window-viewport manipulation*



Complete the graphics program available in the course homepage:

[http://www.tecgraf.puc-rio.br/~lfm/HW2\\_GLDrawerViewCtrl.zip](http://www.tecgraf.puc-rio.br/~lfm/HW2_GLDrawerViewCtrl.zip).

This program uses Qt interface system and OpenGL graphics system.

Understanding the given code is part of the assignment.

An executable program, which is the solution of the assignment, is provided:

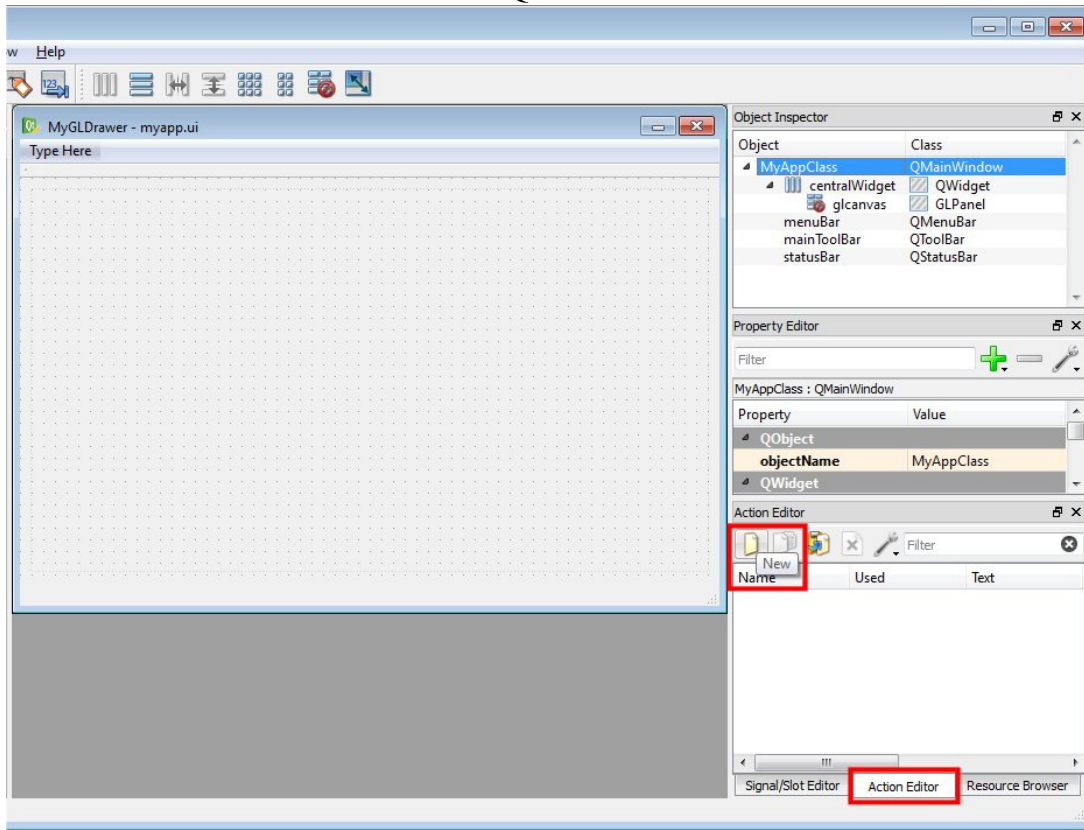
[http://www.tecgraf.puc-rio.br/~lfm/HW2\\_GLDrawerViewCtrl-solution.zip](http://www.tecgraf.puc-rio.br/~lfm/HW2_GLDrawerViewCtrl-solution.zip).

### **Assignment**

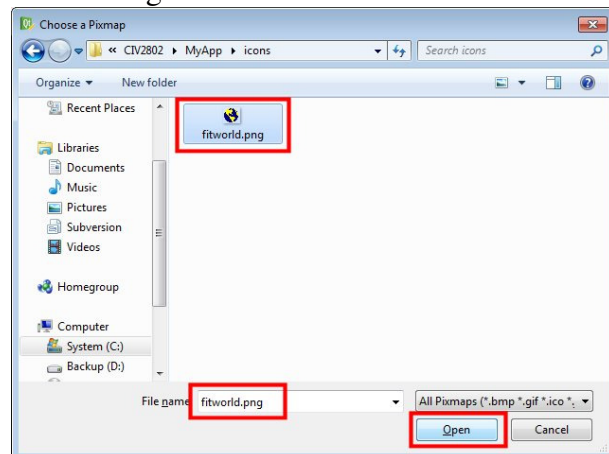
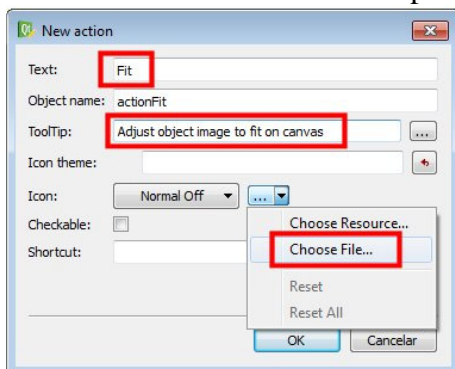
1. Complete the lines of code in file `glpanel.cpp` that are indicated by comments `/**/ COMPLETE HERE - GLPANEL: XX *//`.
2. Add the following buttons to the tool bar of the program:
  - Fit*: fit object image on program canvas.
  - Zoom in*: zoom in (increase) object image on program canvas.
  - Zoom out*: zoom out (reduce) object image on program canvas.
  - Pan left*: move object image left on program canvas.
  - Pan right*: move object image right on program canvas.
  - Pan down*: move object image down on program canvas.
  - Pan up*: move object image up on program canvas.It is required to create icon imagens for each of these buttons.
3. Modify files `myapp.h` and `myapp.cpp` to treat actions associated to these buttons.

## Tutorial to insert a button and its action in the tool bar

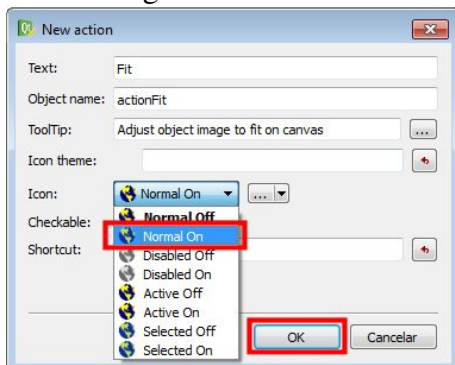
### 1. Creation of an action for a button in Qt Designer:



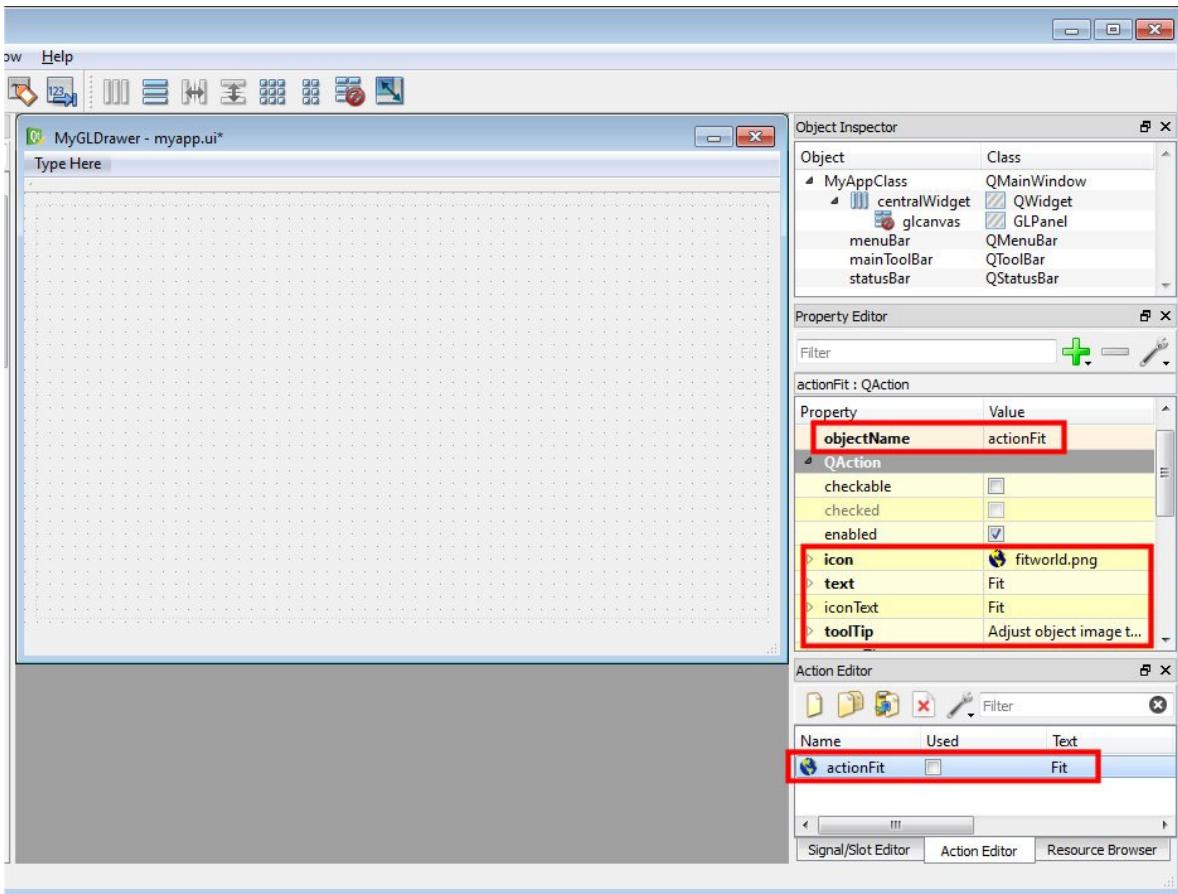
### 2. Edition of action name and tip text, and selection of image file with button icon:



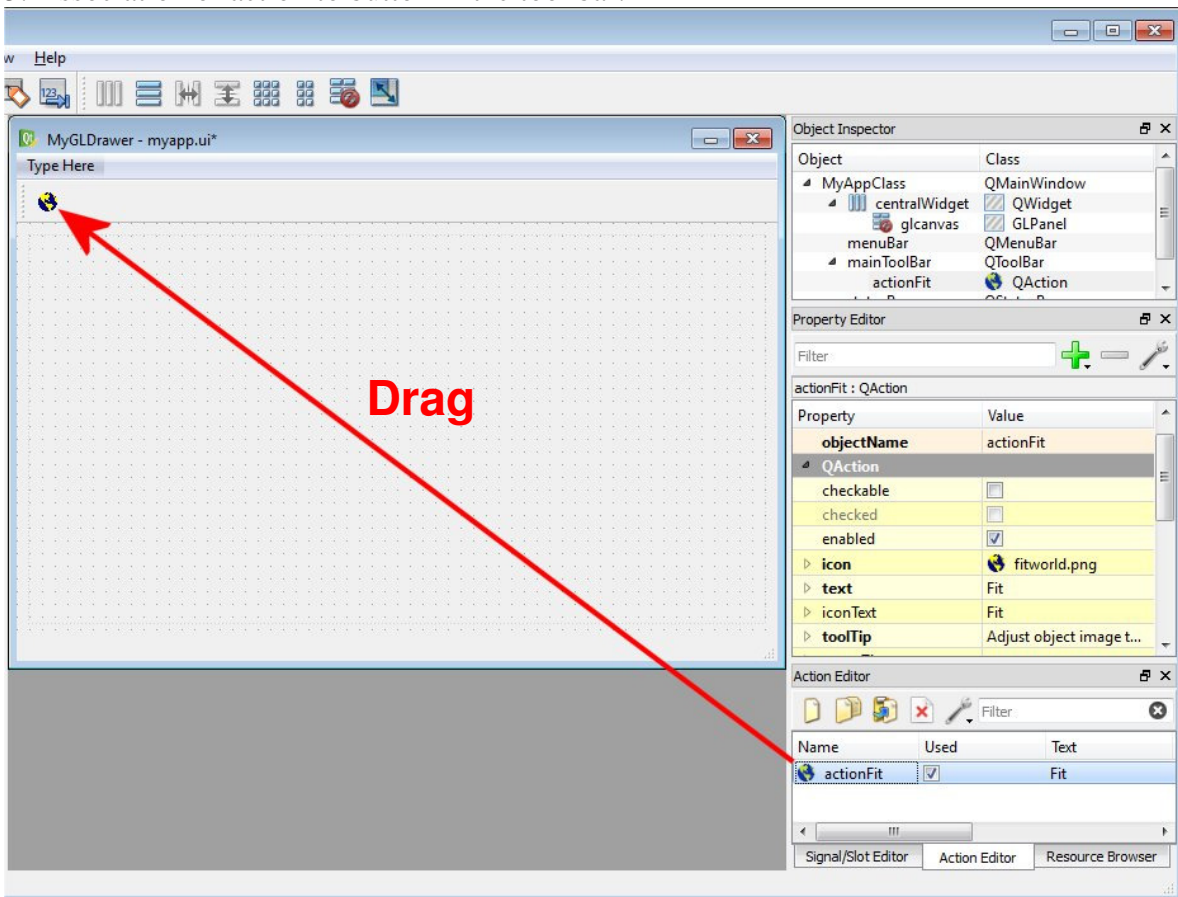
### 3. Finishing association of icon image to button:



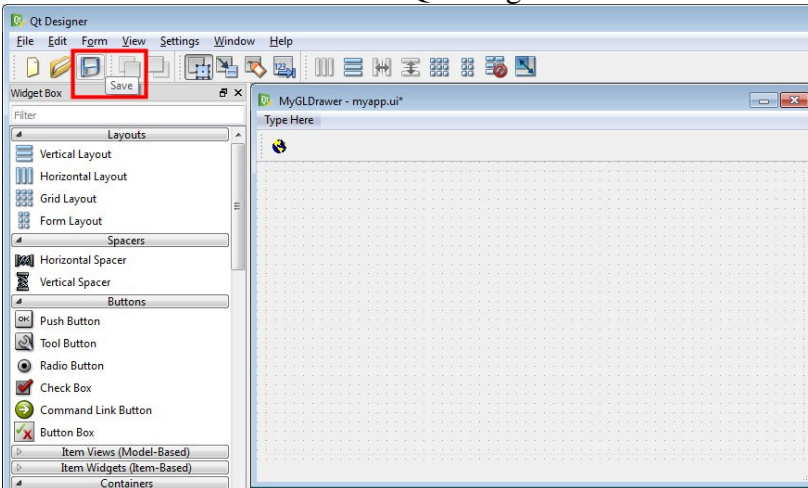
#### 4. Verification of created action:



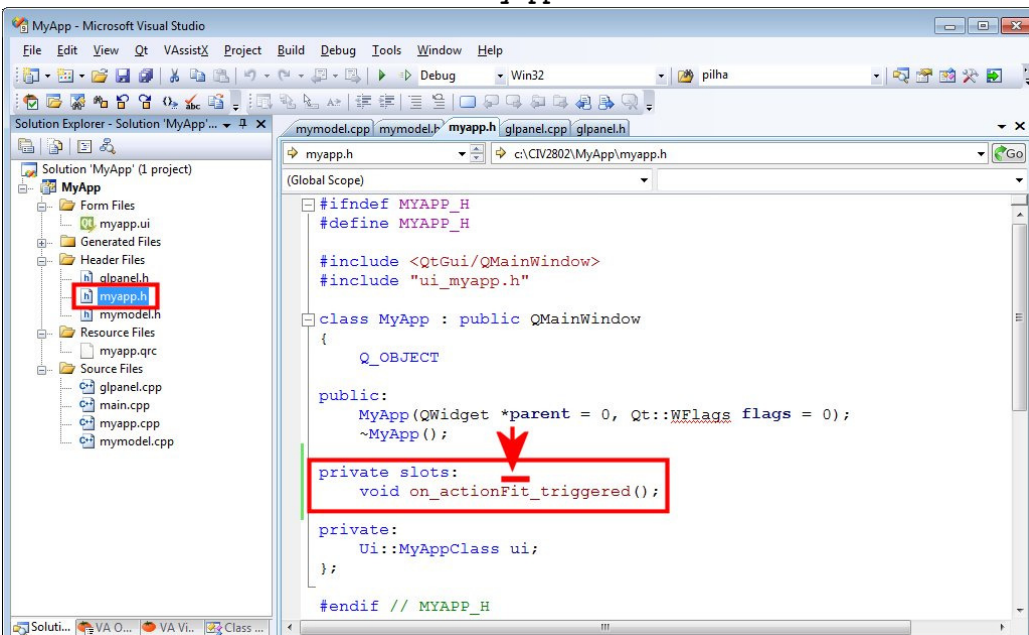
#### 5. Association of action to button in the tool bar:



## 6. Save modifications made in Qt Designer:



## 7. Declaration of slot method in file myapp.h:



## 8. Definition of slot method in file myapp.cpp:

