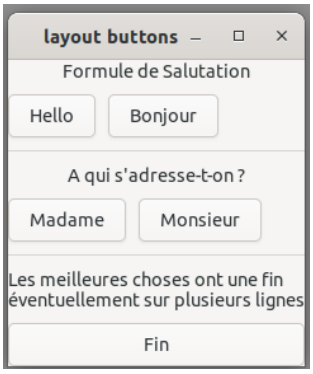
PoP Série 5 Solution

Exercice 2 (niveau 1) : **Layout et Label**



La solution ci-dessous choisit de faire afficher un passage à la ligne seulement quand on clique sur le destinataire (Madame ou Monsieur). L'ensemble du code source étant disponible dans le fichier PoP_s5_sol, on ne reprend ici que layoutbuttons.cc

Remarquer la différence d'initialisation de m_Box_Top d'une part (Verticalement) et de M_Box1 et m_Box2 d'autre part (Horizontalement). Le label m_Fin apparait sur 2 lignes dans l'interface grâce à \n

L'organisation spatiale de l'interface est obtenu avec la répartitition des widgets entre m_Box_Top et les deux autres.

```
#include <iostream>
#include "layoutbuttons.h"
using namespace std;

LayoutButtons::LayoutButtons() :
  m_Box_Top(Gtk::Orientation::VERTICAL,10),
  m_Box1(Gtk::Orientation::HORIZONTAL,10),
  m_Box2(Gtk::Orientation::HORIZONTAL,10),
  m_Label_Salutation("Formule de Salutation"),
  m_Label_Destinataire("A qui s'adresse-t-on ?"),
  m_Label_Fin("Les meilleures choses ont une fin\n"
              "éventuellement sur plusieurs lignes"),
  m_Button_Hello("Hello"),
  m_Button_Bonjour("Bonjour"),
  m_Button_Monsieur("Monsieur"),
  m_Button_Madame("Madame"),
  m_Button_Fin("Fin")
{
  // Set title and border of the window
  set_title("layout buttons");

  // Add outer box to the window (because the window
  // can only contain a single widget)
  set_child(m_Box_Top);

  //Put the inner boxes and the separator in the outer box:
  m_Box_Top.append(m_Label_Salutation);
  m_Box_Top.append(m_Box1);
  m_Box_Top.append(m_Separator1);
  m_Box_Top.append(m_Label_Destinataire);
  m_Box_Top.append(m_Box2);
  m_Box_Top.append(m_Separator2);
  m_Box_Top.append(m_Label_Fin);
  m_Box_Top.append(m_Button_Fin);
  // Put Hello / Bonjour buttons in Box1:
```

```
  m_Box1.append(m_Button_Hello);
  m_Box1.append(m_Button_Bonjour);
  // Put Madame / Monsieur buttons in Box2:
  m_Box2.append(m_Button_Madame);
  m_Box2.append(m_Button_Monsieur);

  // Connect the clicked signal of the button to
  // thier signal handler
  m_Button_Hello.signal_clicked().connect(sigc::mem_fun(*this,
              &LayoutButtons::on_button_clicked_Hello) );

  m_Button_Bonjour.signal_clicked().connect(sigc::mem_fun(*this,
              &LayoutButtons::on_button_clicked_Bonjour) );

  m_Button_Monsieur.signal_clicked().connect(sigc::mem_fun(*this,
              &LayoutButtons::on_button_clicked_Monsieur) );

  m_Button_Madame.signal_clicked().connect(sigc::mem_fun(*this,
              &LayoutButtons::on_button_clicked_Madame) );

  m_Button_Fin.signal_clicked().connect(sigc::mem_fun(*this,
              &LayoutButtons::on_button_clicked_Fin) );

}

LayoutButtons::~LayoutButtons()
{
}

void LayoutButtons::on_button_clicked_Hello()
{
  cout << "Hello " ;
}

void LayoutButtons::on_button_clicked_Bonjour()
{
  cout << "Bonjour " ;
}

void LayoutButtons::on_button_clicked_Monsieur()
{
  cout << "Monsieur" << endl;
}

void LayoutButtons::on_button_clicked_Madame()
{
  cout << "Madame" << endl;
}

void LayoutButtons::on_button_clicked_Fin()
{
  hide(); //to close the application.
}
```

Exercice 3 (niveau 1) : **Coordinates conversion from the Model space to the Application's window width and height / preventing distortion (in English)**

a) *[see source code archive folder GTK_conversion_avec_translate_et_scale]*

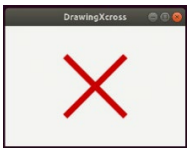
For clarity purpose the solution defines a **struct Frame** that gathers both the Model space framing = [**xMin,xMax**] and [**yMin,yMax**], the window parameters **width** and **height** and the aspect-ratio width/height named **asp**.

A default variable of this type named **default_frame** is used to initialize the added **frame** attribute to the MyArea class. Its value is set by the default constructor.

The static function **orthographic_projection** is hidden within the class implementation as it is only defined to highlight its purpose of setting the conversion from the Model space to the window space (principle of abstraction). It is called within the overriden method **on_draw()** after the **frame** attribute is updated with the current window **width** and **height**. After the call to this function the drawing is done with coordinates expressed in the Model space.

When changing the window size, the conversion is updated BUT the scaling factor along X and Y might be different in absolute value, hence introducing a distorsion (the lines may not be orthogonal anymore).

expected result with initial window size :



Distorsions introduced when changing the window size :

b) *[see source code archive folder GTK_conversion_sans_distorsion]*

The difference with answer a) is the addition of the **adjustFrame** method that changes the Model framing so that :

1) its aspect ratio **(xMax-xMin)/(yMax-yMin)** becomes the same as the one the window : **width/height**,
2) the drawing is always centered in the window

There are 2 strategies for adjustment depending on the value of the new window aspect-ratio **width/height**

3.1) *if it is bigger or equal than the default one* (i.e. the new window is more flat than the initial one) Then keep the default yMin and yMax and adjust xMin and xMax to get the same aspect ratio

3.2) *if it is smaller than the default one* (i.e. the new window is less flat than the initial one) Then keep the default xMin and xMax and adjust yMin and yMax to get the same aspect ratio

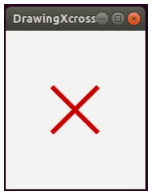
The **adjustFrame** method has to be called at the beginning of **on_draw**() to update the Model framing based on the new values of width and height. After the Model framing adjustment is done the conversion and the drawing calls are put in place as in the previous question.

expected result with initial window size :

NO MORE Distorsions introduced when changing the window size :

3.1)

3.2)



Exercice 4 (niveau 1) : **convertir le type paramétré Form de la Série3 en une hiérarchie de classes tirant parti du Polymorphisme** *[see source code archive sub-folder polymorphism_exo4]*