

Tuesday – part 4

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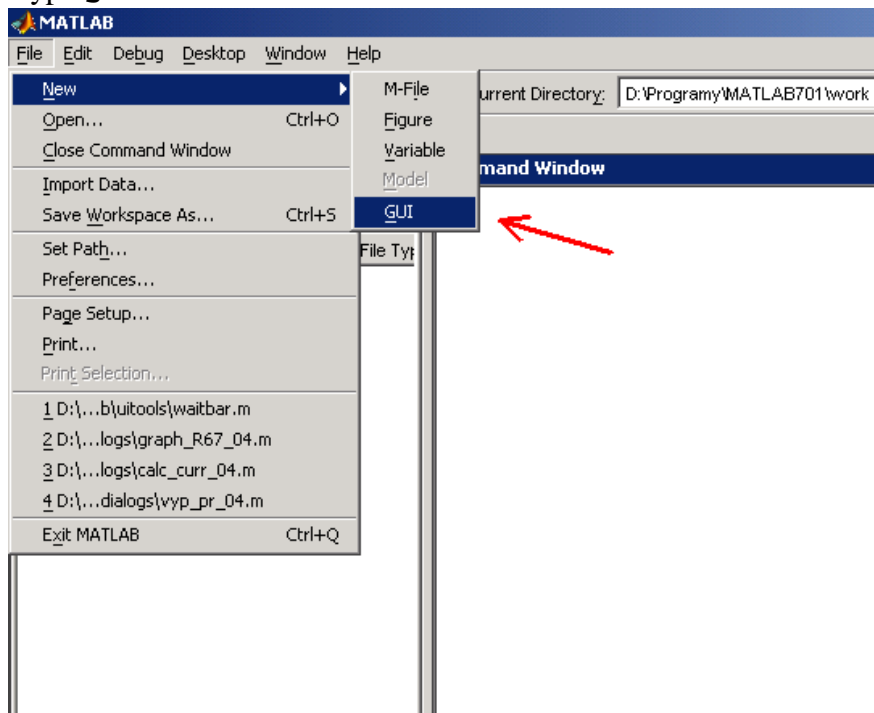
MATLAB – GUI and multimedia

6. Graphical user interface – drawing layout, development, basic skills. Development of a simple graphical user interface application.

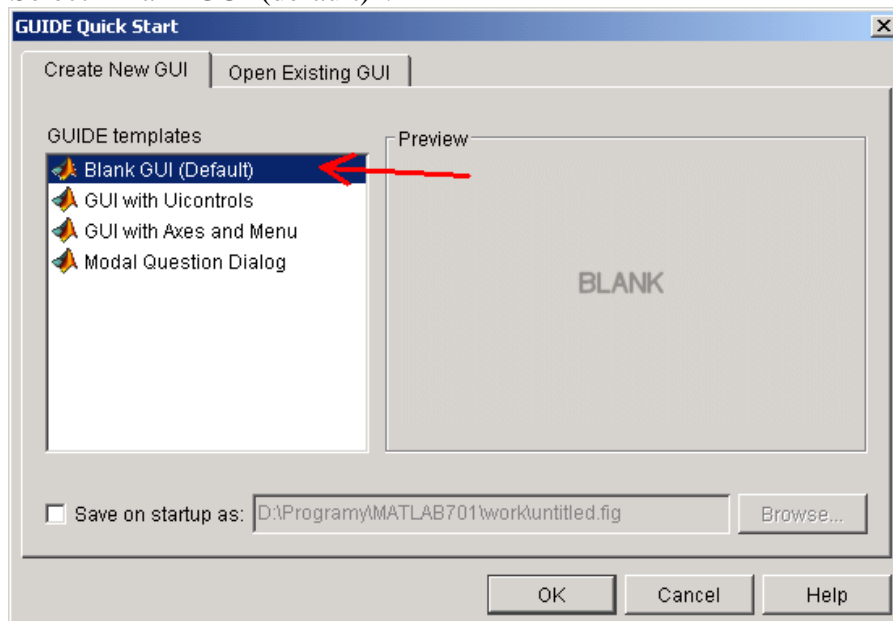
Example:

Simple GUI application development:

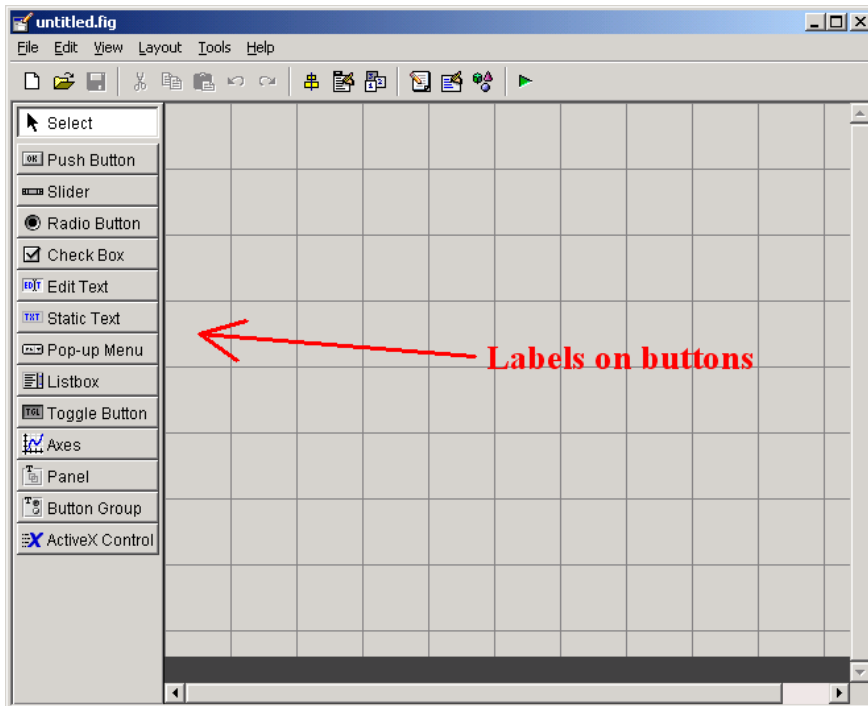
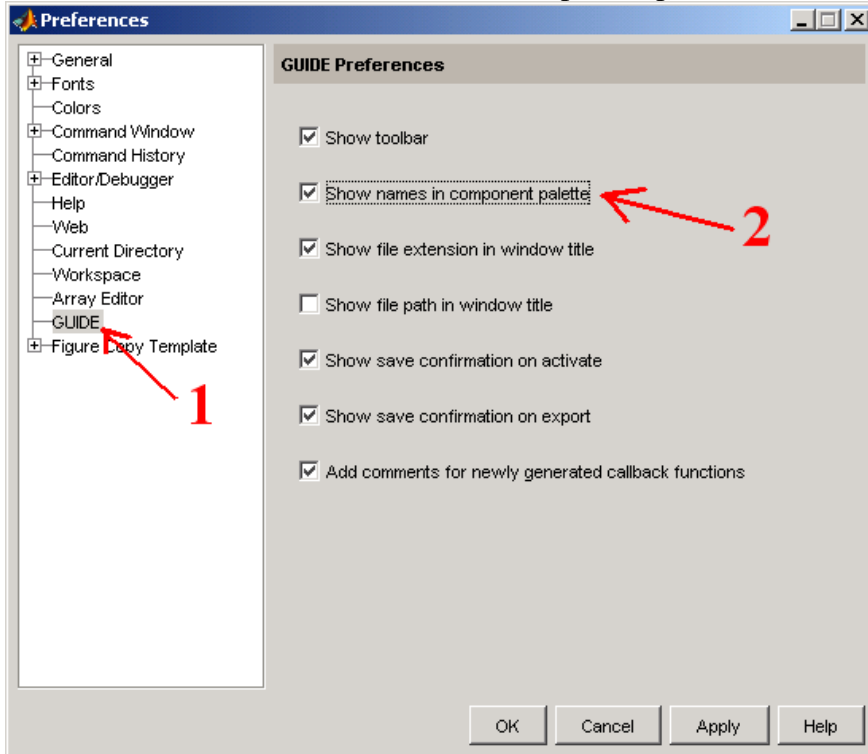
1. Type **guide** in MATLAB command window or start it from menu File -> New -> GUI.



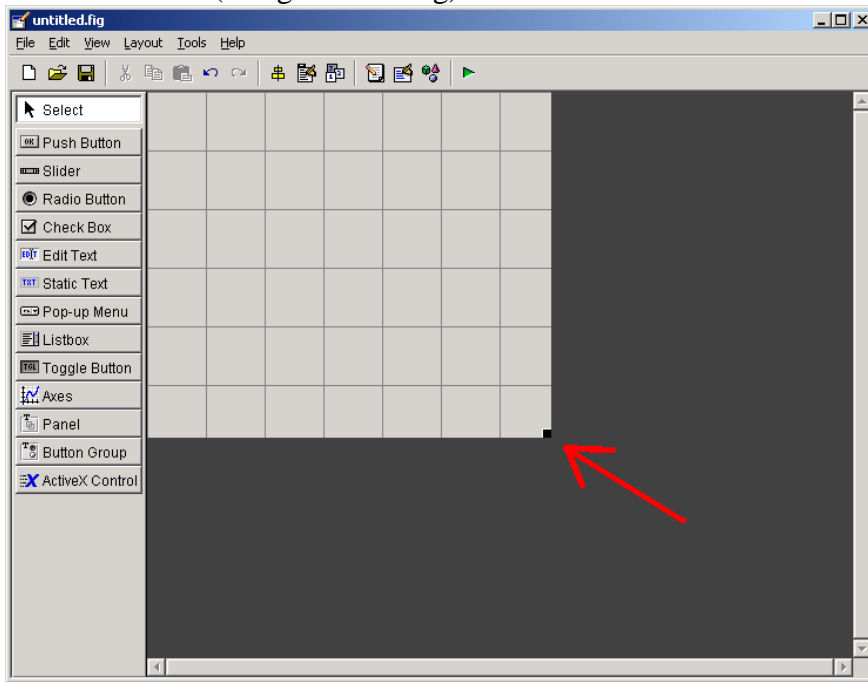
2. Select “Blank GUI (default)”.



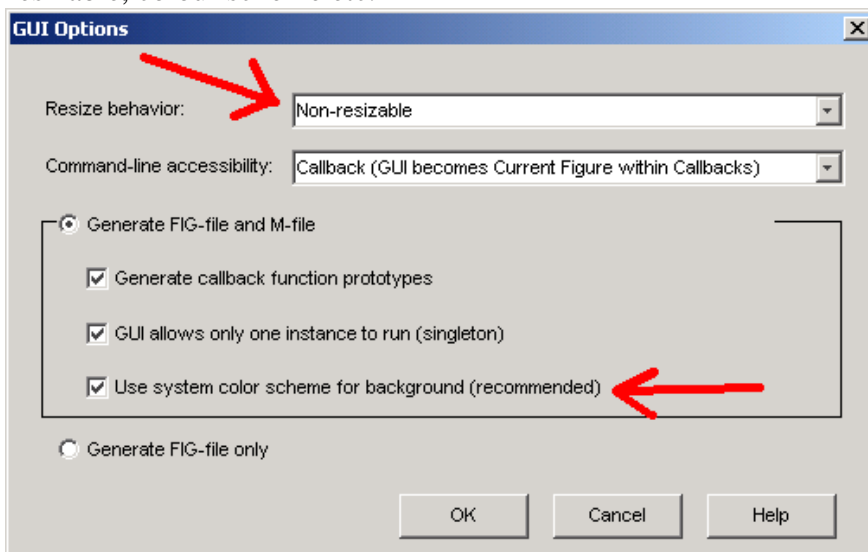
3. Select menu File -> Preferences.
4. Here select GUIDE -> Show names in component palette (and check it).



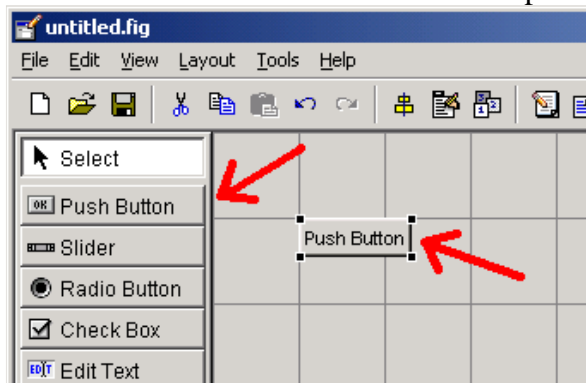
5. Resize the GUI (using mouse drag).



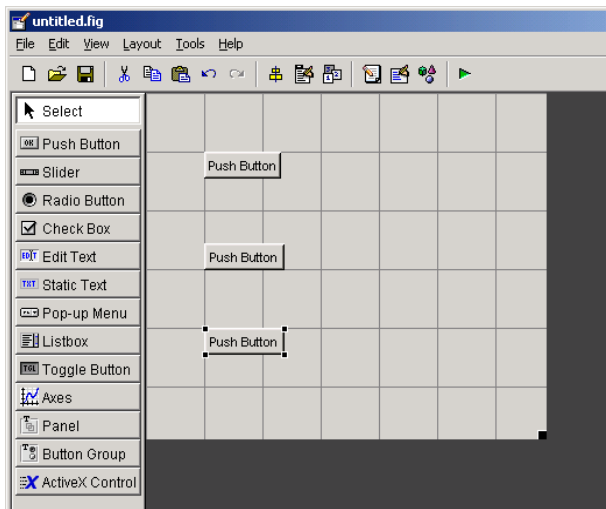
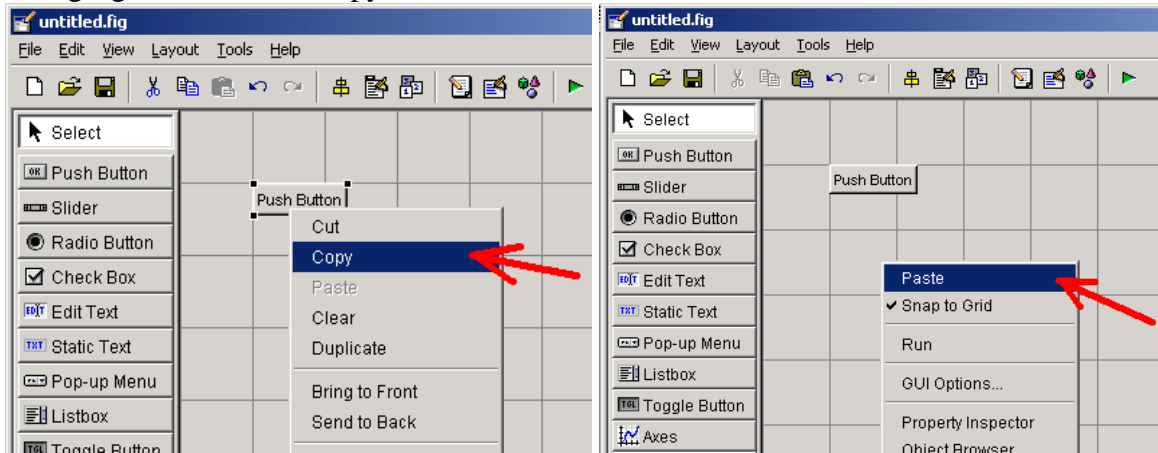
6. Menu Tools -> GUI Options – there is possible to set-up some parameters of GUI, for exaple, if it resizable, colour scheme etc.



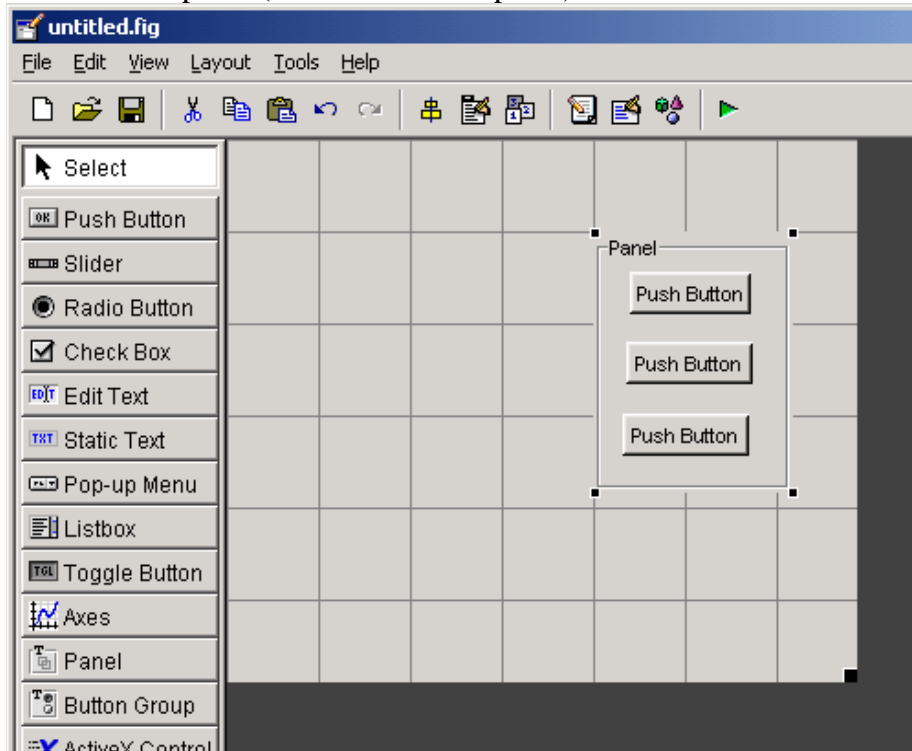
7. Select Push button from the left-handed panel and drag it into GUI.



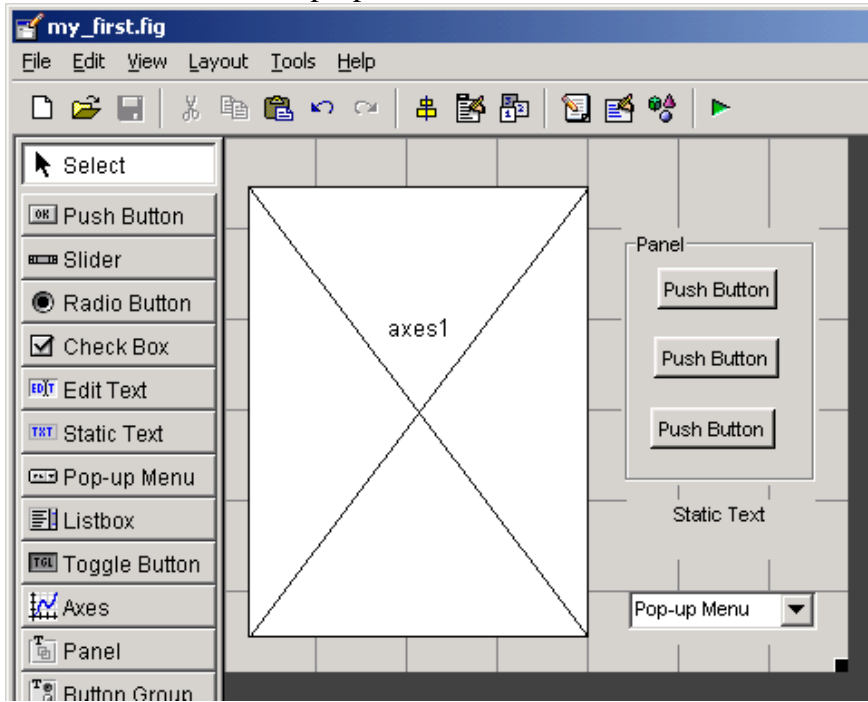
8. Using right-click menu, copy two times this button.



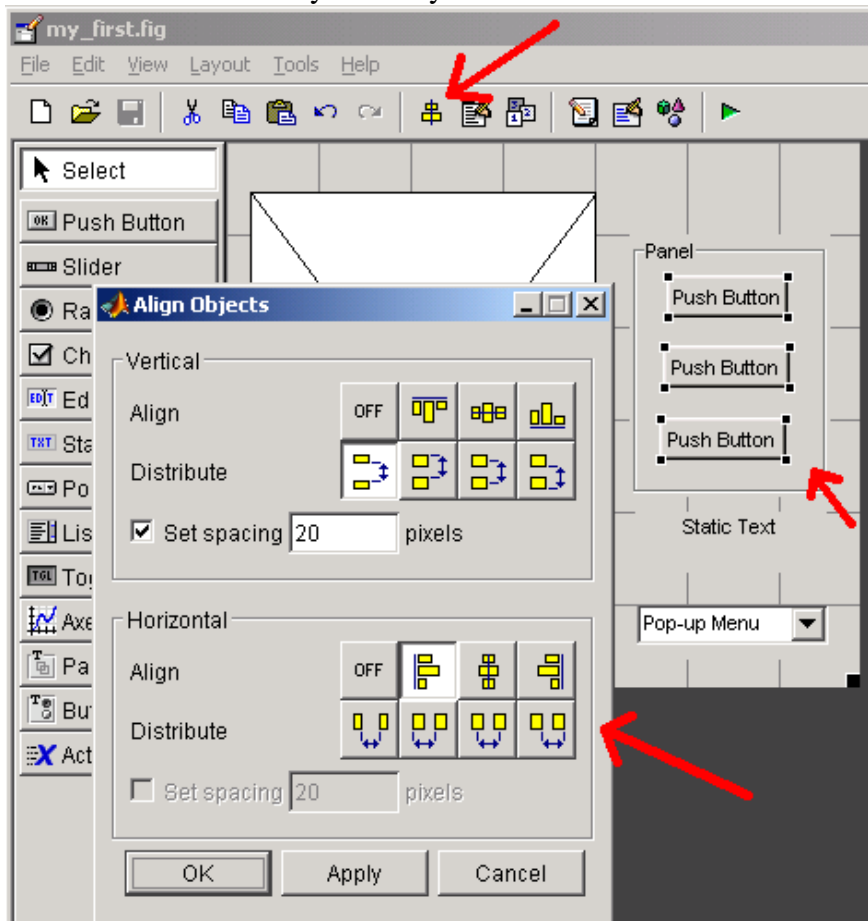
9. Create a new panel (from left-handed panel) and move buttons into this panel.



10. Create a Static Text, Pop-up Menu and Axes.

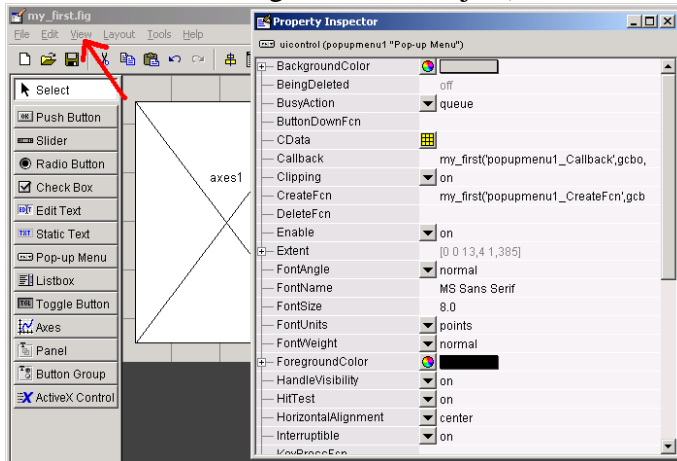


11. Align objects (for example buttons) using align menu. To select more than one object, use mouse left-click and simultaneously with key Shift or Ctrl.

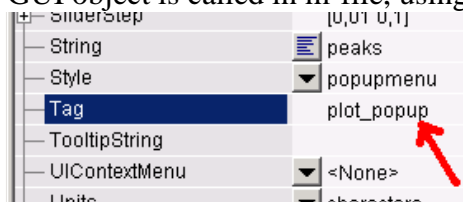


12. Small adjustments of selected objects position are possible using arrows keys.

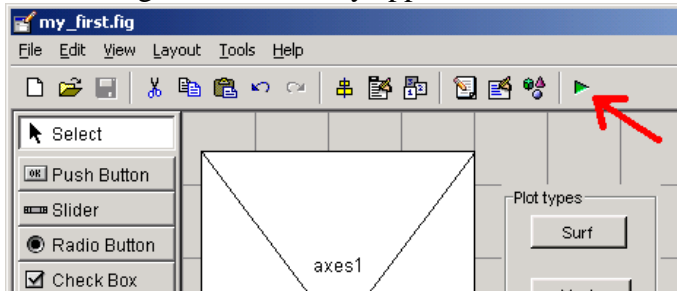
13. Now we can change some objects properties. Select menu View -> Property Inspector (it is available with use of mouse right-click on object).



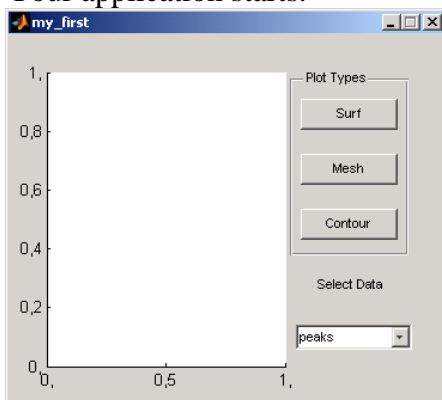
14. A high important attribute is the **Tag** property. It is used to “communicate” between m-file and GUI, i.e. GUI object is called in m-file, using this **Tag**.



15. Now it is the time to activate the GUI. Use green triangle at the right side of the GUI editor. An Save as... dialogue automatically appears and automatically will be opened m-file editor with source code.

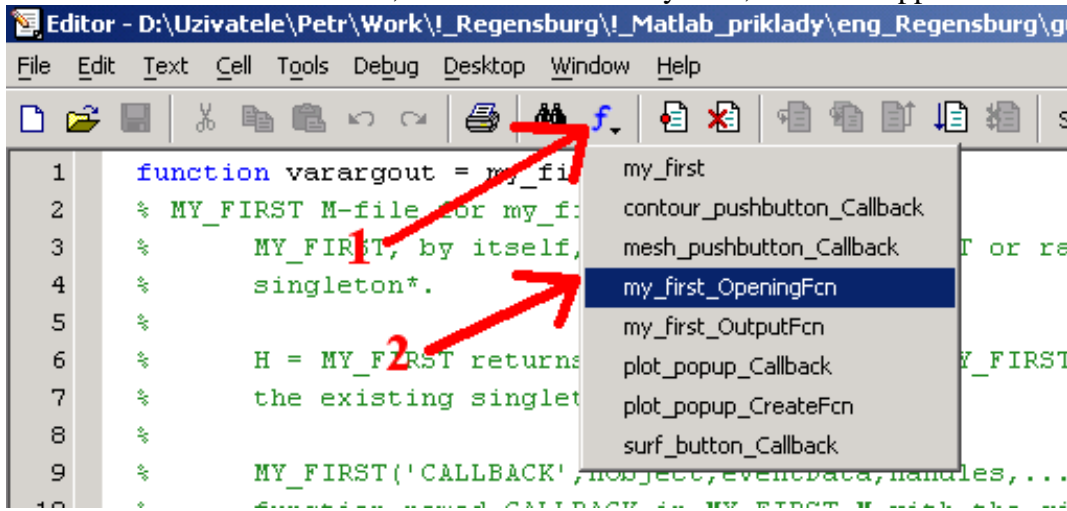


16. Your application starts.



17. Generated code now should be completed by integrated your code, which implements computations, implementation of equations, calling another m-files etc. This custom code is known as “**call-back functions**”.

18. Now select call-back function, which is called every time, when the application starts.



19. Please insert here this code (generating first plot).

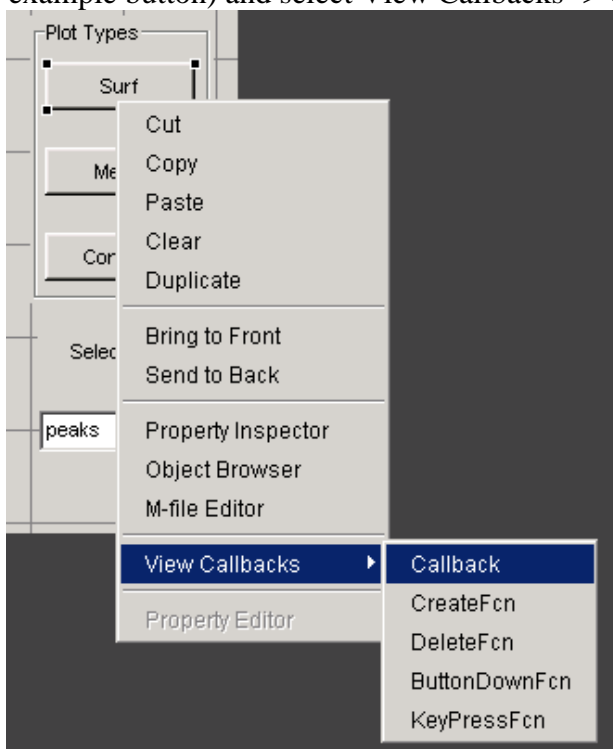
```

%Create the data to plot
handles.peaks = peaks(35);
handles.membrane = membrane;
[x,y] = meshgrid(-8:.5:8);
r = sqrt(x.^2+y.^2) + eps;
z = sin(r)./r;
handles.sinc = z;
handles.current_data = handles.peaks;
surf(handles.current_data)

```

20. Now switch back to the GUI editor and run application (green triangle).

21. It is possible to find the call-back function with help of GUI – right click mouse on the object (for example button) and select View Callbacks -> Callback.



22. Please update callback functions of buttons within this code:

```
function surf_button_Callback(hObject, eventdata, handles)
surf(handles.current_data);

function mesh_pushbutton_Callback(hObject, eventdata, handles)
mesh(handles.current_data);

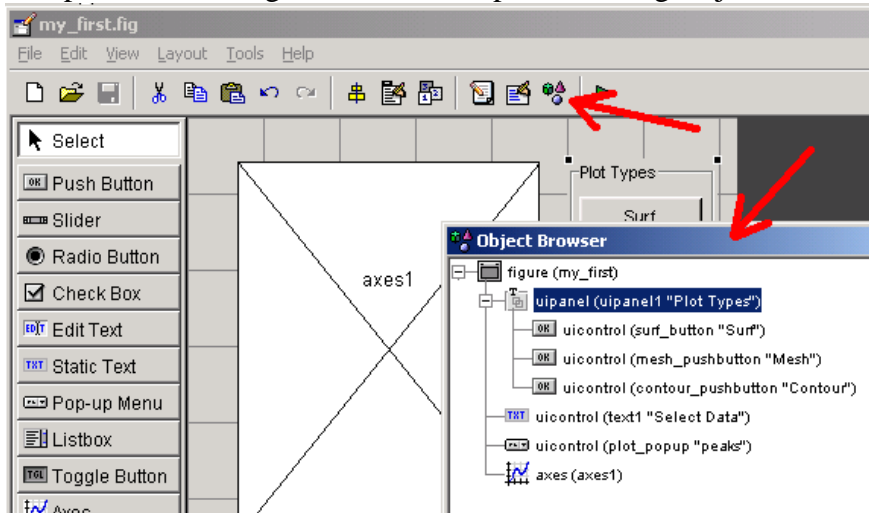
function contour_pushbutton_Callback(hObject, eventdata, handles)
contour(handles.current_data);

function plot_popup_Callback(hObject, eventdata, handles)
val = get(hObject, 'Value');
str = get(hObject, 'String');
switch str{val};
case 'peaks'
handles.current_data = handles.peaks;
case 'membrane'
handles.current_data = handles.membrane;
case 'sinc'
handles.current_data = handles.sinc;

end
guidata(hObject, handles)
```

23. Now we can bring back the GUI editor.

24. It is possible to navigate the GUI components using Object Browser.



25. Now test application using green triangle, ;) again.

26. Close GUI editor and test to run application from MATLAB Command Window.

Congratulation, your first GUI application in MATLAB is finished.