

# DSP Lab Demo 4 Exercise 2

## Major Code Changes

### 1. Added GUI Slider for Cutoff Frequency

```
sld = uislider(fig, ...
    'Position',[100 75 300 3], ...
    'Limits',[100 4000], ...
    'Value',1000, ...
    'ValueChangedFcn',@(sld,event) updatePlot(ax,sld.Value,Fs));
```

### 2. Filter Update

```
function updatePlot(ax,fc,Fs)
    [b,a] = butter(4,fc/(Fs/2)); % 4th-order Butterworth
    [h,w] = freqz(b,a,1024,Fs);
    plot(ax,w,abs(h))
    xlabel(ax,'Frequency (Hz)')
    ylabel(ax,'Magnitude')
    title(ax,['Low-pass Filter, fc = ', num2str(fc), ' Hz'])
end
```

### 3. Displayed Frequency Response in GUI

```
ax = uiaxes(fig, ...
    'Position',[50 150 400 200]);
updatePlot(ax,1000,Fs)
```

## Outcome

The GUI allows intuitive control of filter cutoff using a slider. The frequency response plot updates in real-time, giving immediate visual feedback.