Matlab tutorial (Simulink)

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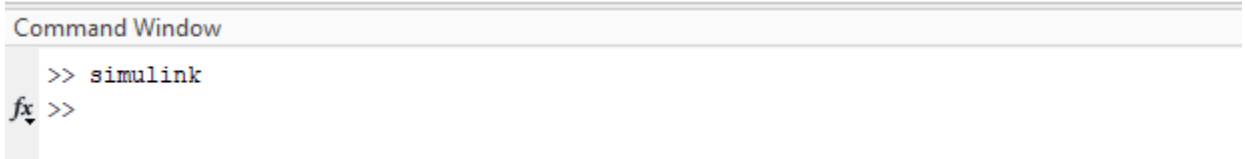
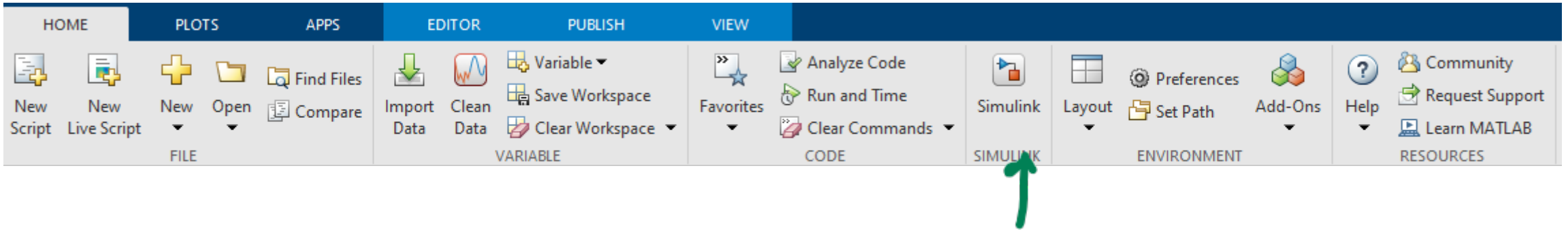
How to start simulink

Type ‘simulink’ in the command window



Or just click the symbol



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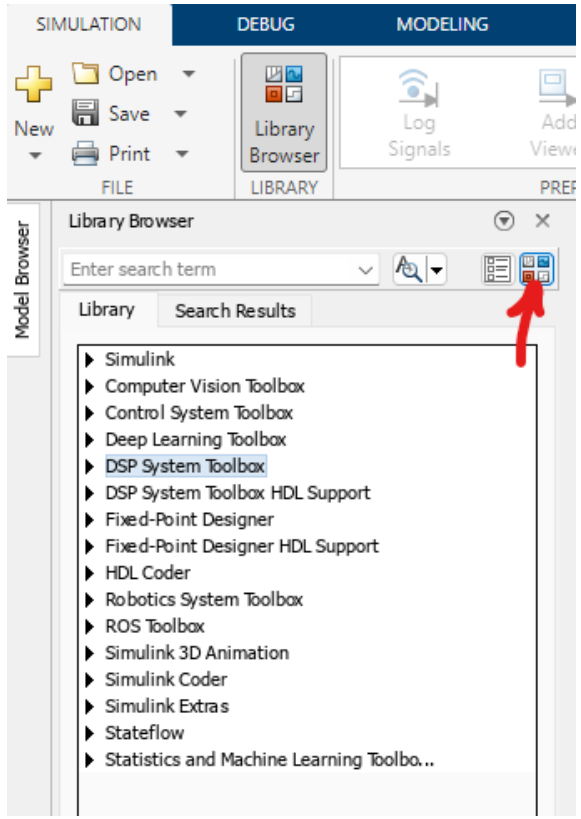
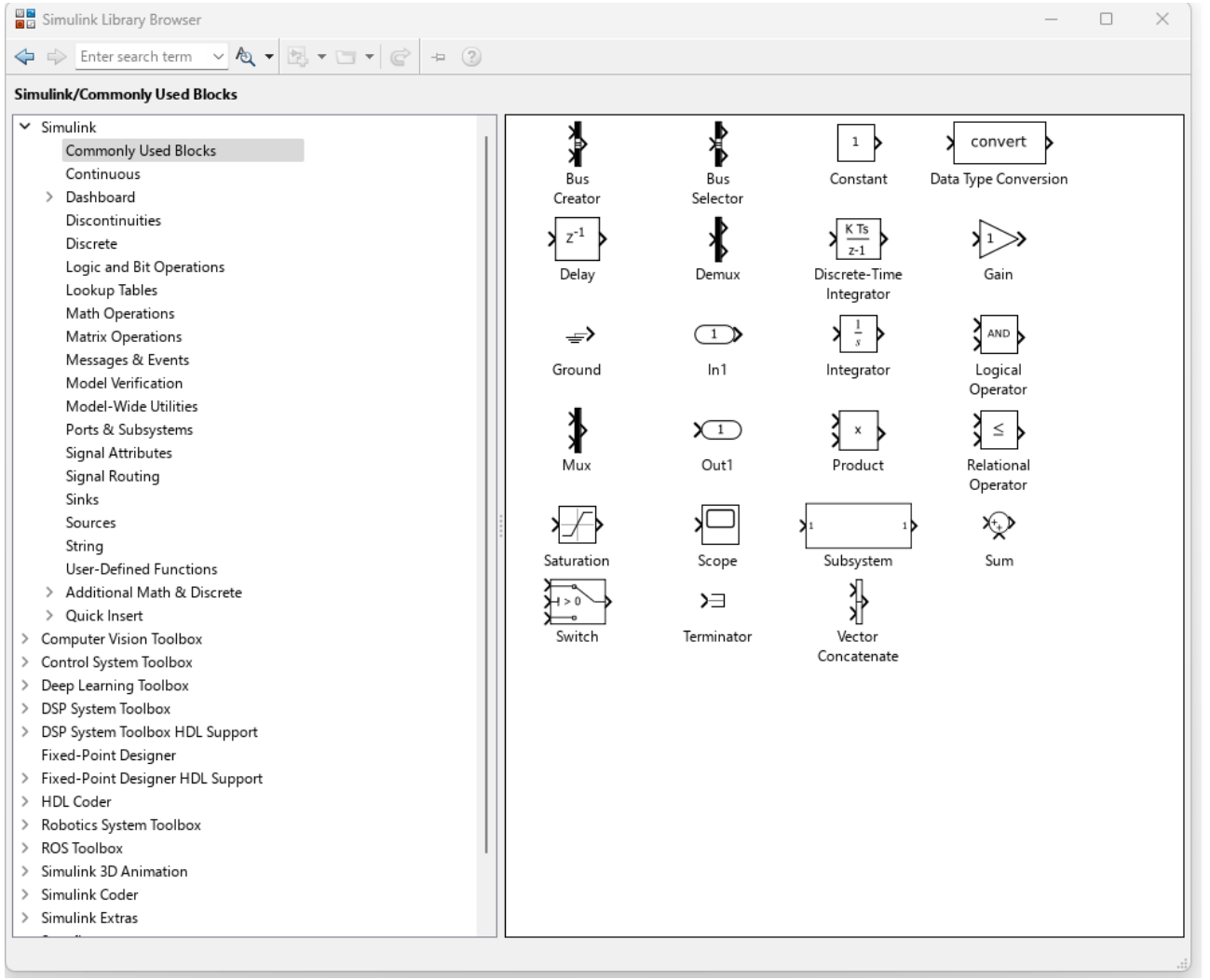
Open library - toolbox





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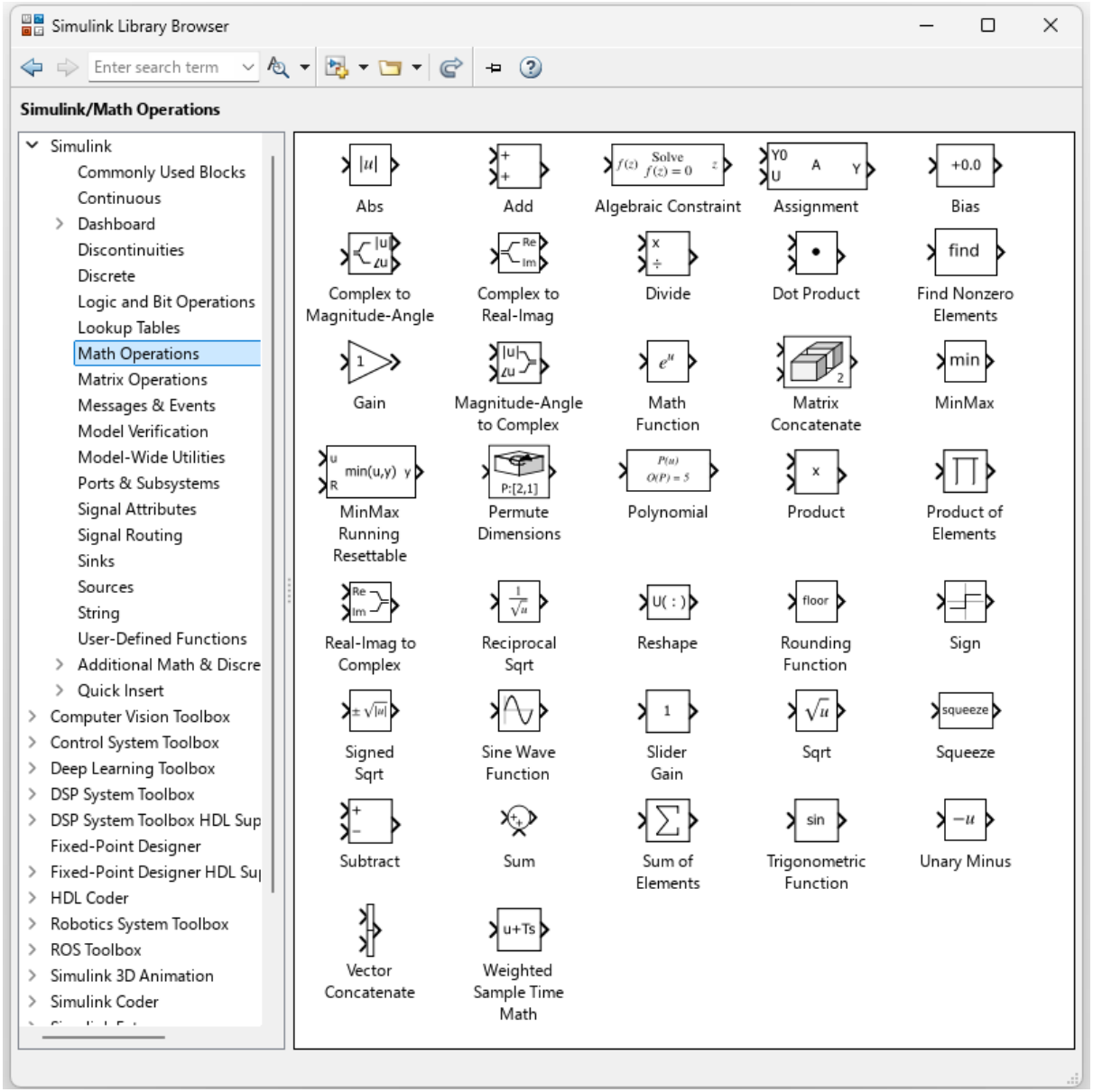
Commonly used tools

→ Simulink -> Discrete
  → Delay
  → Discrete Filter
→ Simulink -> Math Operations
  → Gain
  → Sum
  → A lot more …
→ Simulink -> Sinks
  → Scope
→ Simulink -> Sources
  → Sine Wave

Drag the symbol, place them onto the workspace, use lines to connect them.
Then press ‘run’



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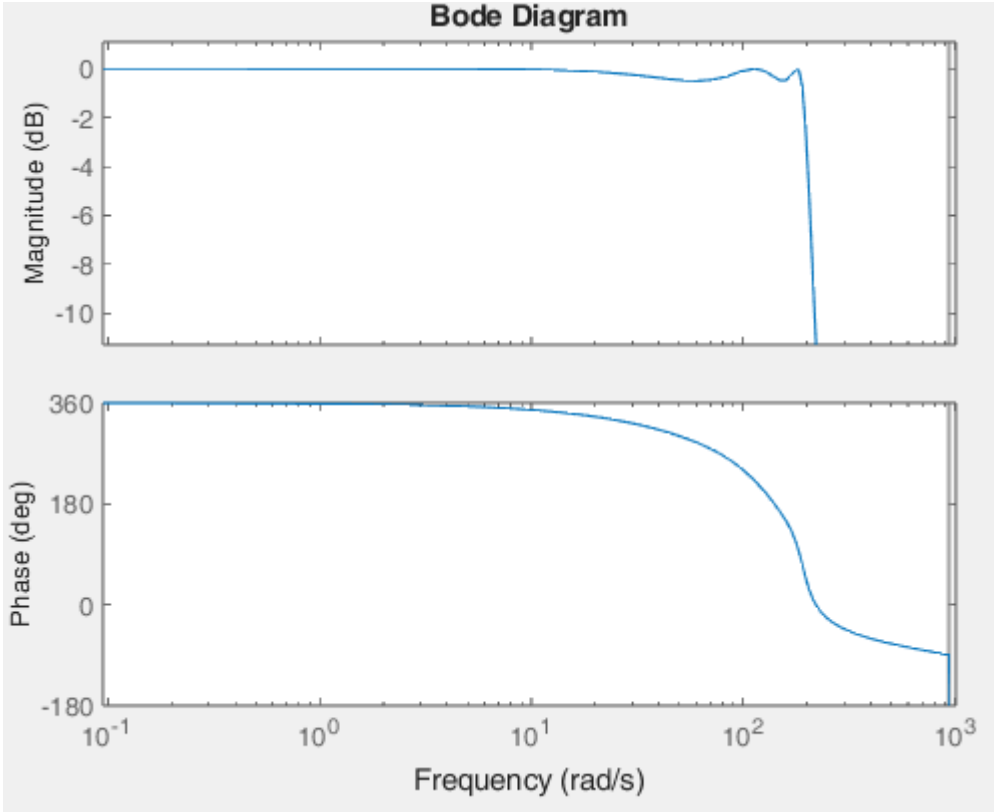
Let’s draw the 5th order 0.5 dB Chebyshev lowpass filter

```
fc = 30; % cut off frequency 30 Hz
fs = 100; % sampling frequency 100 Hz
[b,a] = cheby1(5,0.5,fc/(fs/2));
H_z = tf(b,a,1/fs)
bode(H_z)
```




```
% you will receive
ans =

 0.06654 z^5 + 0.3327 z^4 + 0.6654 z^3 + 0.6654 z^2 + 0.3327 z + 0.06654
  ----------------------------------------------------------------------
      z^5 + 0.1825 z^4 + 1.001 z^3 - 0.2126 z^2 + 0.268 z - 0.1098
```

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Let’s realize it using

→ Direct type I
→ Direct type II

I will show you how to do that.

Please do experiments on having only 3 digits after the decimal.

→ Cascade structure
→ Parallel structure

The realization of these two will be your exercise!