

Icarus Verilog Installation Guide

Outline

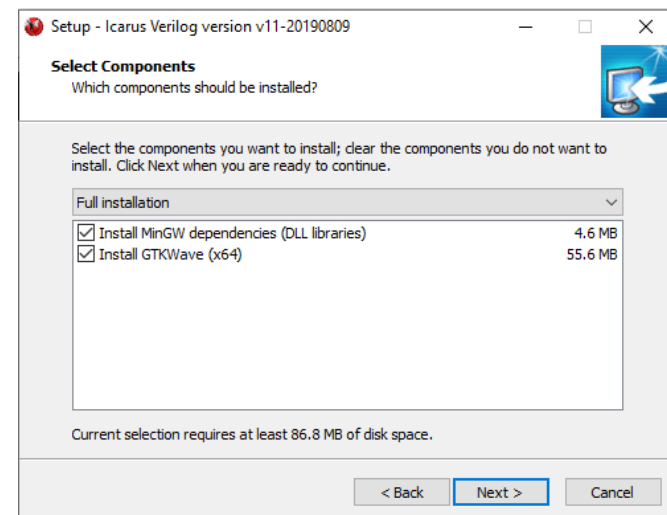
- Download
- Usage
- Demo

Install Icarus Verilog

- Windows
 - <http://bleyer.org/icarus/>
- MacOS
 - `$ brew install icarus-verilog`
- Linux
 - `$ sudo apt install iverilog`

Install gtkwave

- Windows
 - Make sure that you check “Install GTKWave (x64)” when installing iverilog then it will be automatically installed with it.
 - `C:\iverilog\gtkwave\bin\gtkwave.exe`
- MacOS
 - `$ brew install gtkwave`
- Linux
 - `$ sudo apt install gtkwave`



Usage

- iverilog: compiler
- gtkwave: visualization tool
- Compile:
 - `$ iverilog [-o output_file] <source_1.v> [source_2.v] ...`
- Run simulation:
 - `$ vvp <output_file>`

Generate the waveform

- Insert two lines in the testbench.v
 - `$dumpfile("file_name.vcd");`
 - `$dumpvars;`
- The waveform file (.vcd) will be generated after the execution of vvp

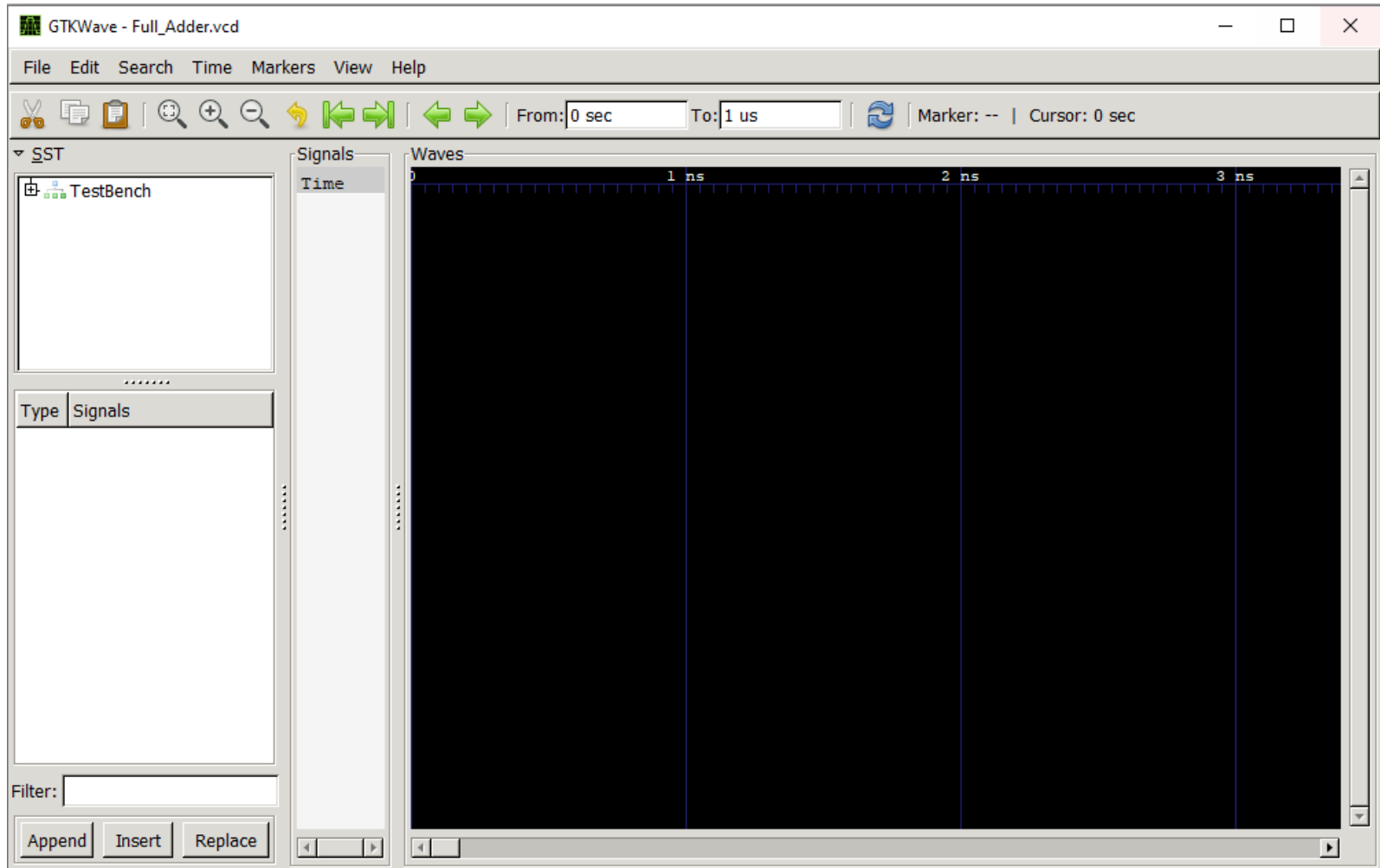
iverilog -- Windows

```
C:\Users\Mike\Documents\CA2019>C:\iverilog\bin\iverilog.exe -o FullAdder.out Full_Adder.v testbench.v

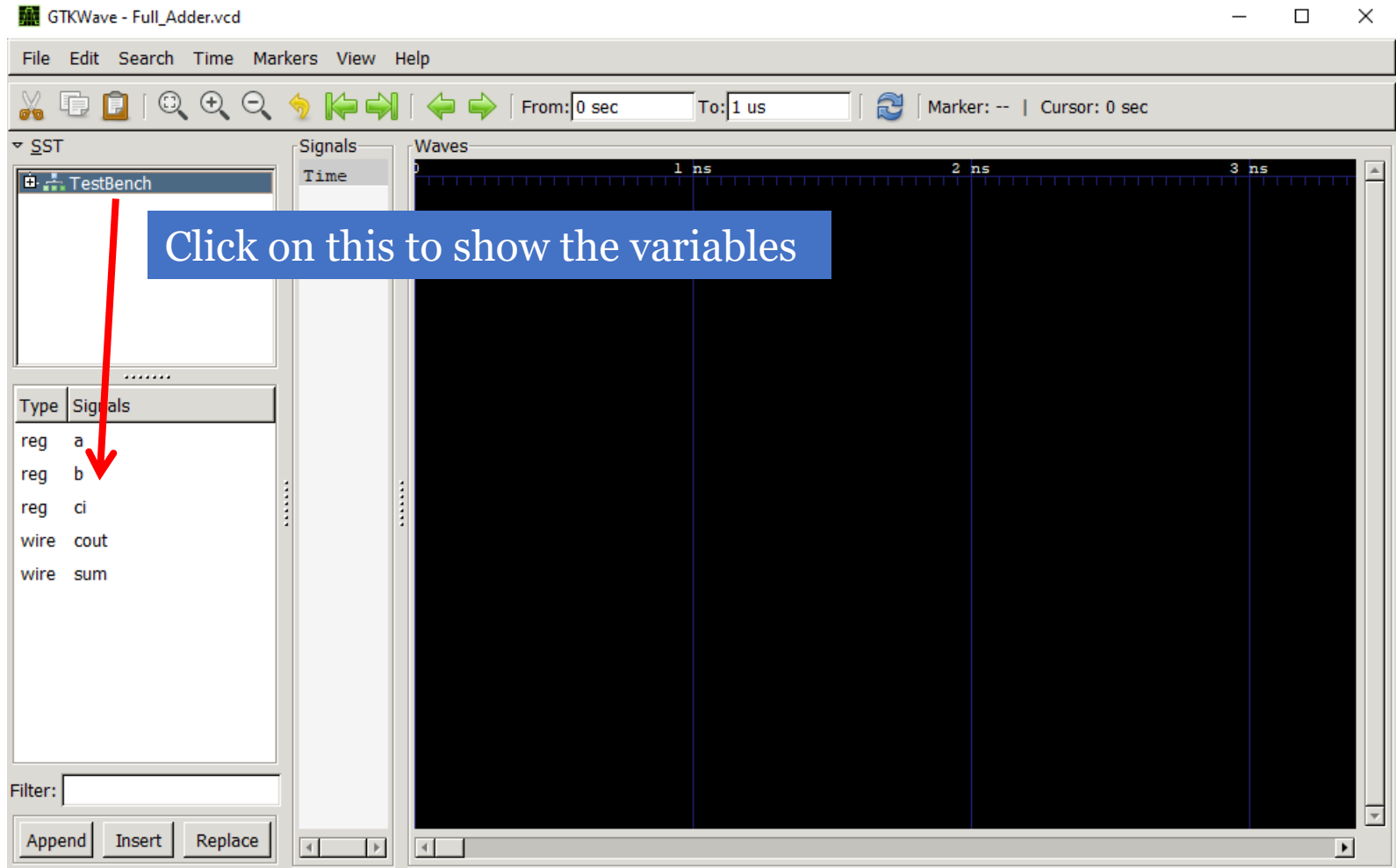
C:\Users\Mike\Documents\CA2019>vvp FullAdder.out
VCD info: dumpfile Full_Adder.vcd opened for output.
Time      0 ns, a=0 b=0 ci=0 sum=0 cout=0
Time     50 ns, a=1 b=0 ci=0 sum=1 cout=0
Time    100 ns, a=0 b=1 ci=0 sum=1 cout=0
Time    150 ns, a=1 b=1 ci=0 sum=0 cout=1
Time    200 ns, a=0 b=0 ci=1 sum=1 cout=0
Time    250 ns, a=1 b=0 ci=1 sum=0 cout=1
Time    300 ns, a=0 b=1 ci=1 sum=0 cout=1
Time    350 ns, a=1 b=1 ci=1 sum=1 cout=1
Time    400 ns, a=0 b=0 ci=0 sum=0 cout=0
Time    450 ns, a=1 b=0 ci=0 sum=1 cout=0
Time    500 ns, a=0 b=1 ci=0 sum=1 cout=0
Time    550 ns, a=1 b=1 ci=0 sum=0 cout=1
Time    600 ns, a=0 b=0 ci=1 sum=1 cout=0
Time    650 ns, a=1 b=0 ci=1 sum=0 cout=1
Time    700 ns, a=0 b=1 ci=1 sum=0 cout=1
Time    750 ns, a=1 b=1 ci=1 sum=1 cout=1
Time    800 ns, a=0 b=0 ci=0 sum=0 cout=0
Time    850 ns, a=1 b=0 ci=0 sum=1 cout=0
Time    900 ns, a=0 b=1 ci=0 sum=1 cout=0
Time    950 ns, a=1 b=1 ci=0 sum=0 cout=1
** VVP Stop(0) **
** Flushing output streams.
** Current simulation time is 1000 ticks.
> finish
** Continue **
```

gtkwave -- Windows

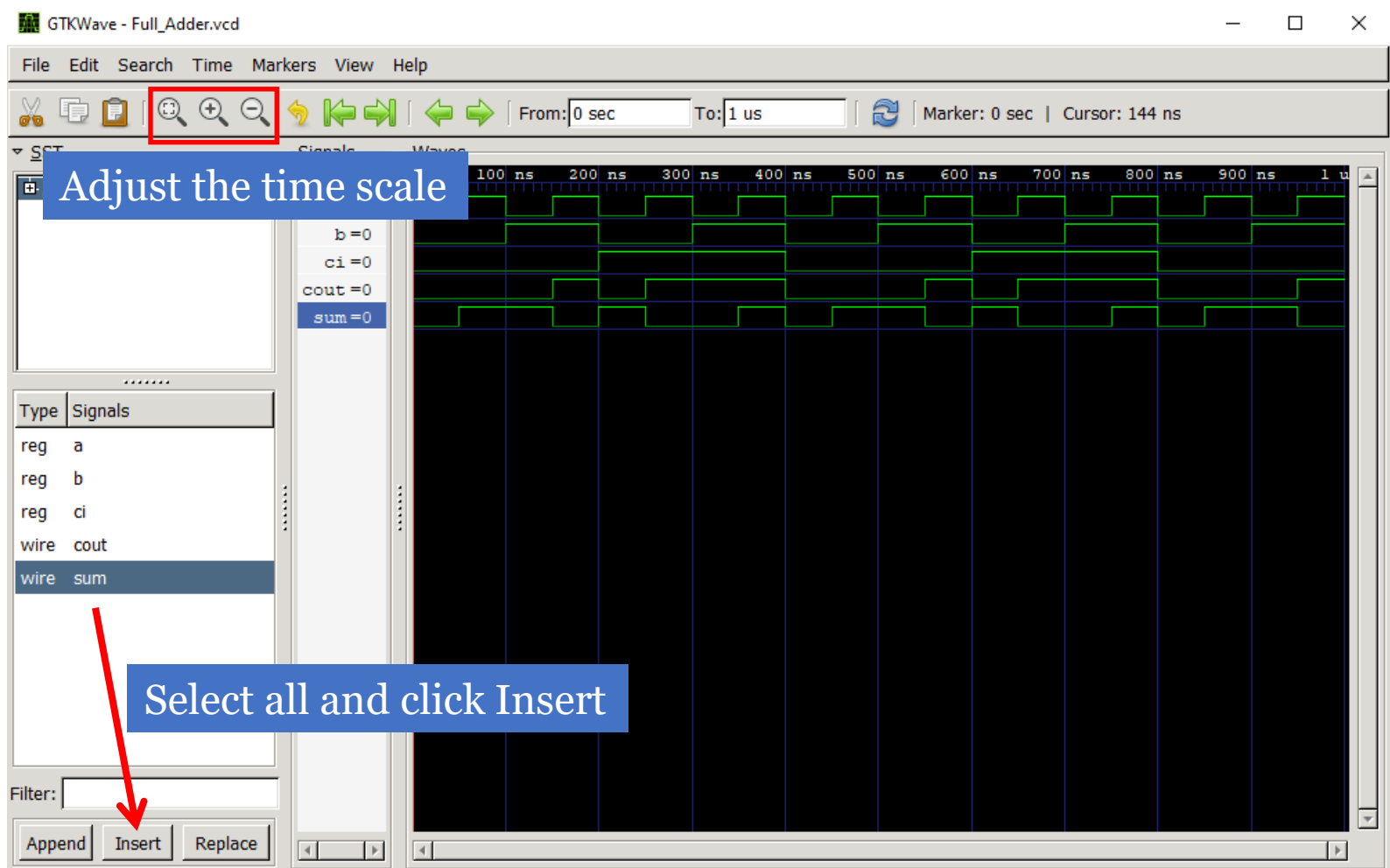
```
$ C:\iverilog\gtkwave\bin\gtkwave.exe Full_Adder.vcd
```



gtkwave -- Windows



gtkwave -- Windows

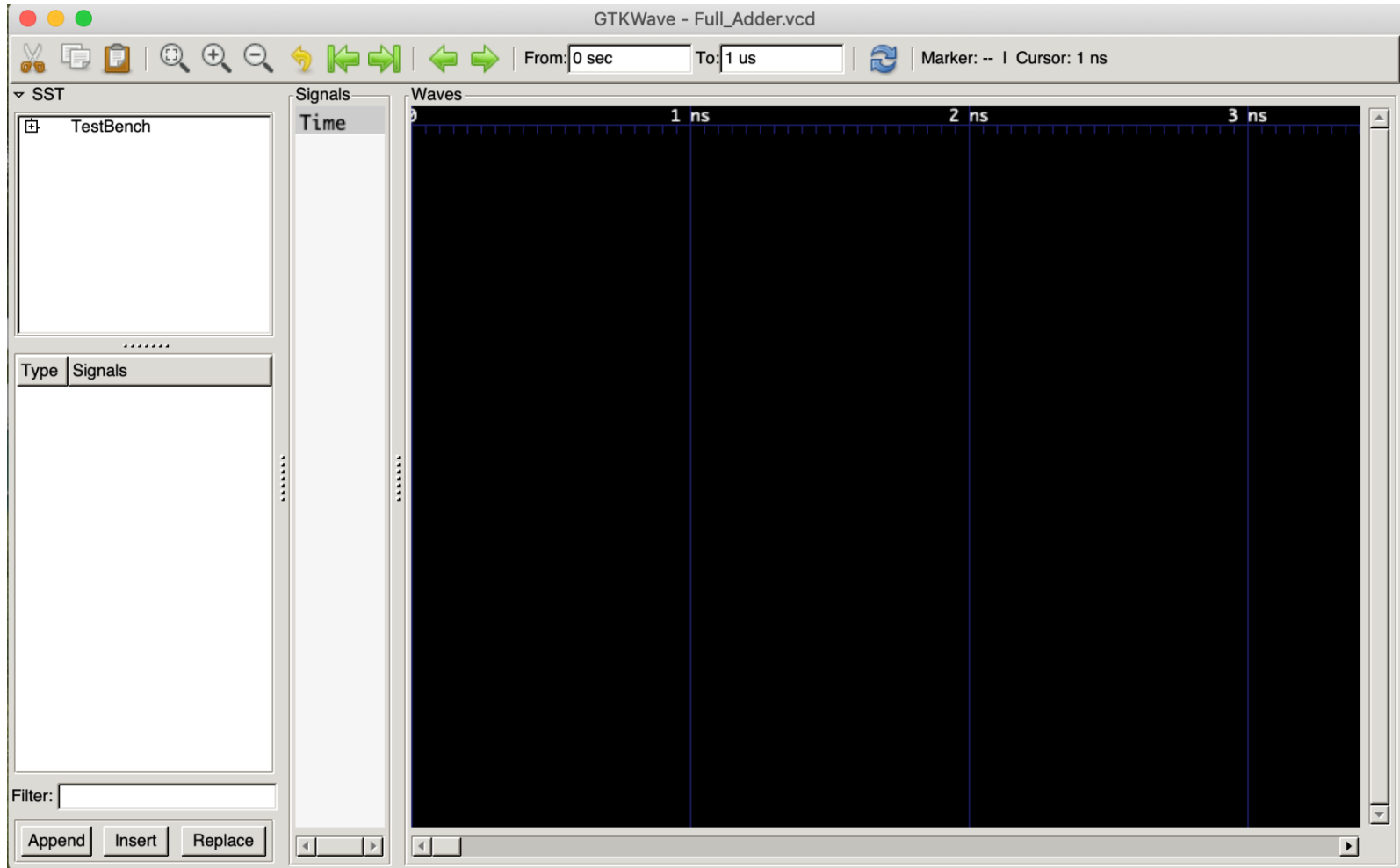


iverilog – MacOS & Linux

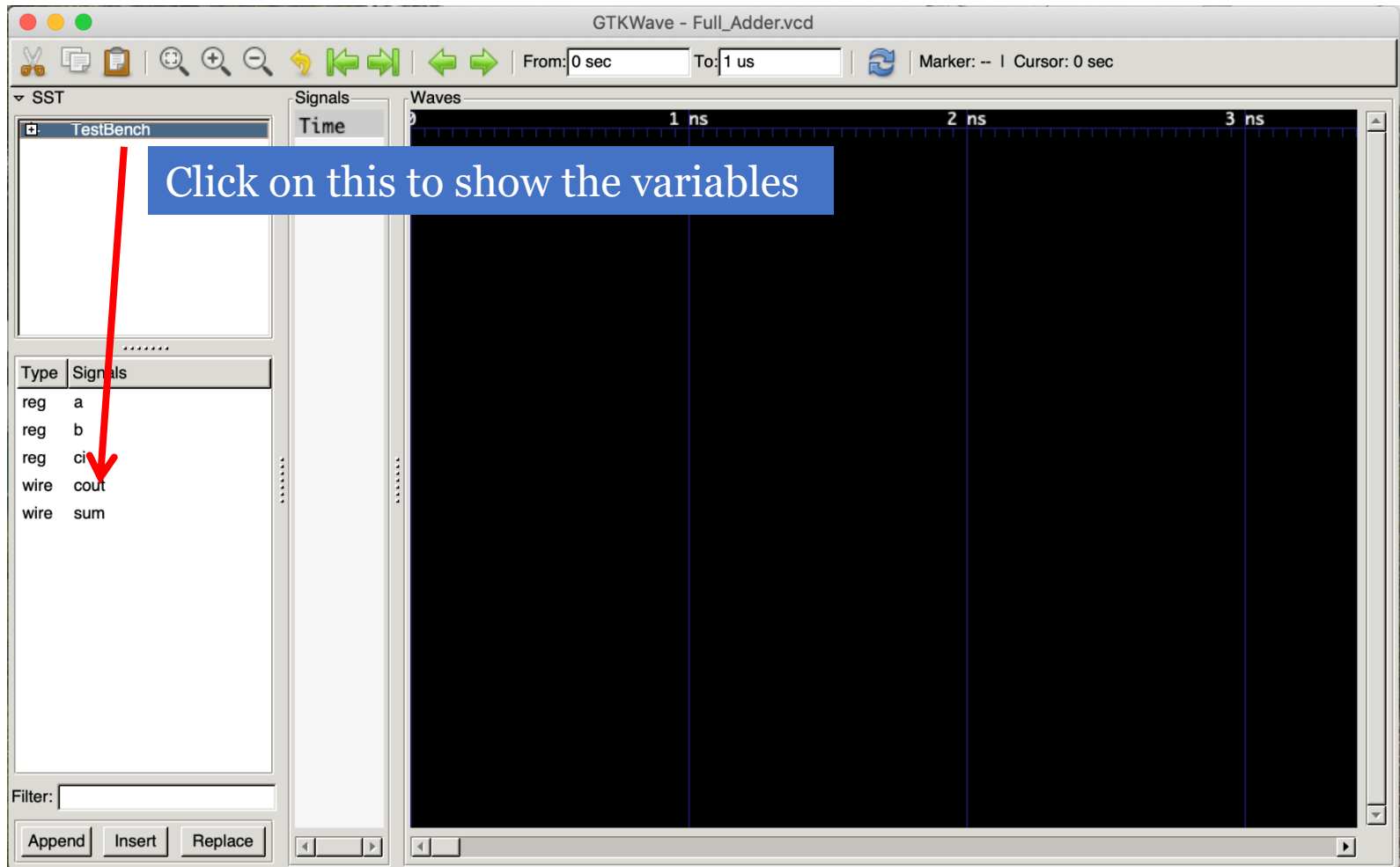
```
MacBook-Pro-3: Mike 11:53 ~
$ iverilog -o Full_Adder.out Full_Adder.v testbench.v
MacBook-Pro-3: Mike 11:53 ~
$ ./Full_Adder.out
VCD info: dumpfile Full_Adder.vcd opened for output.
Time      0 ns, a=0 b=0 ci=0 sum=0 cout=0
Time     50 ns, a=1 b=0 ci=0 sum=1 cout=0
Time    100 ns, a=0 b=1 ci=0 sum=1 cout=0
Time    150 ns, a=1 b=1 ci=0 sum=0 cout=1
Time    200 ns, a=0 b=0 ci=1 sum=1 cout=0
Time    250 ns, a=1 b=0 ci=1 sum=0 cout=1
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Time    350 ns, a=1 b=1 ci=1 sum=1 cout=1
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Time    700 ns, a=0 b=1 ci=1 sum=0 cout=1
Time    750 ns, a=1 b=1 ci=1 sum=1 cout=1
Time    800 ns, a=0 b=0 ci=0 sum=0 cout=0
Time    850 ns, a=1 b=0 ci=0 sum=1 cout=0
Time    900 ns, a=0 b=1 ci=0 sum=1 cout=0
Time    950 ns, a=1 b=1 ci=0 sum=0 cout=1
** VVP Stop(0) **
** Flushing output streams.
** Current simulation time is 1000 ticks.
> finish
** Continue **
```

gtkwave – MacOS & Linux

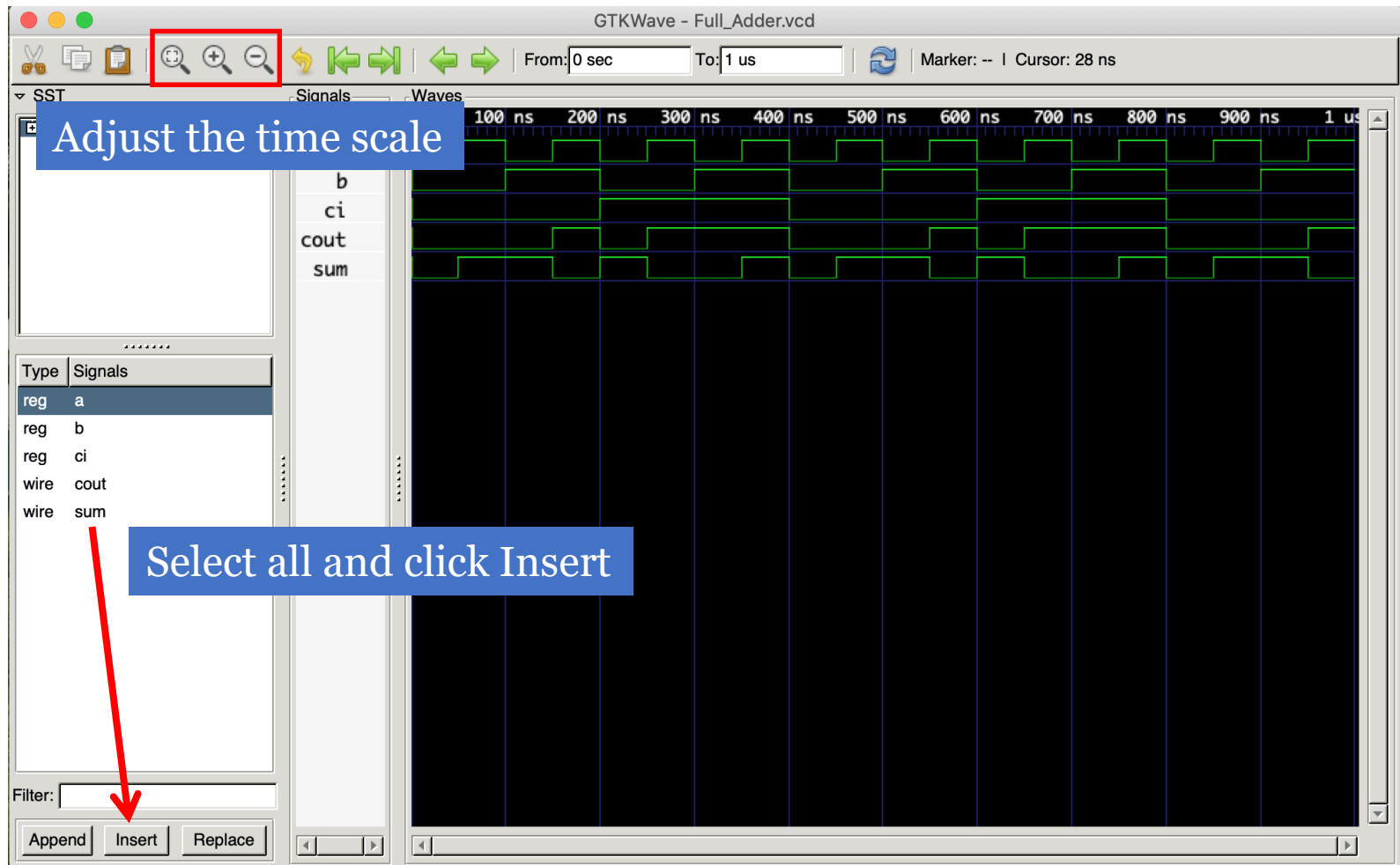
```
$ gtkwave Full_Adder.vcd
```



gtkwave – MacOS & Linux



gtkwave – MacOS & Linux



Appendix

- Adding C:\iverilog\bin into \$PATH in Windows 10
 - <https://www.architectryan.com/2018/08/31/how-to-change-environment-variables-on-windows-10/>
- Install Homebrew on a Mac
 - <https://treehouse.github.io/installation-guides/mac/homebrew>