

```
julia> # this is a comment, it does nothing

julia> x = 5 # assign the integer 5 to the variable x
5

julia> x + 6 # can do integer arithmetic
11

julia> 2^10 # carets mean power to
1024

julia> 2^63 # integers can be somewhat large
-9223372036854775808

julia> 2^62 # integers can be somewhat large
4611686018427387904

julia> 2^63 # be careful!! we'll come back to this
-9223372036854775808

julia> 5/6 # division of integers returns a "real" (a float)
0.8333333333333334

julia> # but there's error!

julia> x + 1 == 6 # we can test equality using ==
true

julia> 5.3 # we can make our own floats
5.3

julia> 4.0 # this is a float, which is different then the integer 4
4.0

julia> exp(2) # many special functions are inbuilt
7.38905609893065

julia> # we can make our own functions using the function command

julia> function f(x)
    x^2
end
f (generic function with 1 method)

julia> f(2) # returns an int corresponding to 2^2
4

julia> f(2.0) # returns a float
4.0

julia> # we sometimes like to write functions on one-lin

julia> g(x) = 2x^2 + 3x + 2
g (generic function with 1 method)

julia> g(2)
16
```

```
julia> # We can load external packages. Here we load a testing package that gives us a "macro" called @test
```

```
julia> using Test
```

```
julia> @test g(2) == 16
Test Passed
```

```
julia> @test g(3) == 16
Test Failed at REPL[24]:1
Expression: g(3) == 16
Evaluated: 29 == 16
```

```
ERROR: There was an error during testing
```

```
julia> # lets add some external packages we will use in this module
```

```
julia> # lets add some external packages we will use in this module. Hit ] to change to package mode
```


```
(@v1.10) pkg> add SetRounding ColorBitstring Plots IJulia
Resolving package versions...
Installed Wayland_protocols_jll — v1.31.0+0
Installed ExceptionUnwrapping — v0.1.10
Installed DataStructures — v0.18.16
Downloaded artifact: Wayland_protocols
Updating `~/.julia/environments/v1.10/Project.toml`
[ce91de38] + ColorBitstring v0.2.0
[91a5bcdd] + Plots v1.39.0
[3cc68bcd] + SetRounding v0.2.1
Updating `~/.julia/environments/v1.10/Manifest.toml`
[d1d4a3ce] + BitFlags v0.1.8
[944b1d66] + CodecZlib v0.7.3
[ce91de38] + ColorBitstring v0.2.0
[35d6a980] + ColorSchemes v3.24.0
[3da002f7] + ColorTypes v0.11.4
[c3611d14] + ColorVectorSpace v0.10.0
[5ae59095] + Colors v0.12.10
[34da2185] + Compat v4.10.1
[f0e56b4a] + ConcurrentUtilities v2.3.0
[d38c429a] + Contour v0.6.2
[9a962f9c] + DataAPI v1.15.0
[864edb3b] + DataStructures v0.18.16
[8bb1440f] + DelimitedFiles v1.9.1
[460bff9d] + ExceptionUnwrapping v0.1.10
[c87230d0] + FFMPEG v0.4.1
[53c48c17] + FixedPointNumbers v0.8.4
[59287772] + Formatting v0.4.2
⌕ [28b8d3ca] + GR v0.72.10
[42e2da0e] + Grisu v1.0.2
[cd3eb016] + HTTP v1.10.1
[1019f520] + JLFzf v0.1.7
[b964fa9f] + LaTeXStrings v1.3.1
[23fbe1c1] + Latexify v0.16.1
[e6f89c97] + LoggingExtras v1.0.3
[1914dd2f] + MacroTools v0.5.12
[442fdcd] + Measures v0.3.2
[e1d29d7a] + Missings v1.1.0
```

```
[77ba4419] + NaMath v1.0.2
[4d8831e6] + OpenSSL v1.4.1
[b98c9c47] + Pipe v1.3.0
[ccf2f8ad] + PlotThemes v3.1.0
[995b91a9] + PlotUtils v1.4.0
[91a5bcd] + Plots v1.39.0
[3cdc5f2] + RecipesBase v1.3.4
[01d81517] + RecipesPipeline v0.6.12
[189a3867] + Reexport v1.2.2
[05181044] + RelocatableFolders v1.0.1
[6c6a2e73] + Scratch v1.2.1
[3cc68bcd] + SetRounding v0.2.1
[992d4aef] + Showoff v1.0.3
[777ac1f9] + SimpleBufferStream v1.1.0
[a2af1166] + SortingAlgorithms v1.2.1
[82ae8749] + StatsAPI v1.7.0
[2913bbd2] + StatsBase v0.34.2
[62fd8b95] + TensorCore v0.1.1
[3bb67fe8] + TranscodingStreams v0.10.2
[5c2747f8] + URIs v1.5.1
[1cfade01] + UnicodeFun v0.4.1
[1986cc42] + Unitful v1.19.0
[45397f5d] + UnitfulLatexify v1.6.3
[41fe7b60] + Unzip v0.2.0
[6e34b625] + Bzip2_jll v1.0.8+0
[83423d85] + Cairo_jll v1.16.1+1
[2702e6a9] + EpollShim_jll v0.0.20230411+0
[2e619515] + Expat_jll v2.5.0+0
[b22a6f82] + FFMPEG_jll v4.4.4+1
[a3f928ae] + Fontconfig_jll v2.13.93+0
[d7e528f0] + FreeType2_jll v2.13.1+0
[559328eb] + FriBidi_jll v1.0.10+0
[0656b61e] + GLFW_jll v3.3.9+0
✎ [d2c73de3] + GR_jll v0.72.10+0
[78b55507] + Gettext_jll v0.21.0+0
[7746bdde] + Glib_jll v2.76.5+0
[3b182d85] + Graphite2_jll v1.3.14+0
[2e76f6c2] + HarfBuzz_jll v2.8.1+1
[aacddb02] + JpegTurbo_jll v3.0.1+0
[c1c5ebd0] + LAME_jll v3.100.1+0
[88015f11] + LERC_jll v3.0.0+1
[1d63c593] + LLVMOpenMP_jll v15.0.7+0
[dd4b983a] + LZ0_jll v2.10.1+0
✎ [e9f186c6] + Libffi_jll v3.2.2+1
[d4300ac3] + Libgcrypt_jll v1.8.7+0
[7e76a0d4] + Libglvnd_jll v1.6.0+0
[7add5ba3] + Libgpg_error_jll v1.42.0+0
[94ce4f54] + Libiconv_jll v1.17.0+0
[4b2f31a3] + Libmount_jll v2.35.0+0
✎ [89763e89] + Libtiff_jll v4.5.1+1
[38a345b3] + Libuuid_jll v2.36.0+0
[e7412a2a] + Ogg_jll v1.3.5+1
[458c3c95] + OpenSSL_jll v3.0.12+0
[91d4177d] + Opus_jll v1.3.2+0
[30392449] + Pixman_jll v0.42.2+0
[c0090381] + Qt6Base_jll v6.5.3+1
[a44049a8] + Vulkan_Loader_jll v1.3.243+0
[a2964d1f] + Wayland_jll v1.21.0+1
```

```

[2381bf8a] + Wayland_protocols_jll v1.31.0+0
[02c8fc9c] + XML2_jll v2.12.2+0
[aed1982a] + XSLT_jll v1.1.34+0
[ffd25f8a] + XZ_jll v5.4.5+0
[f67eecfb] + Xorg_libICE_jll v1.0.10+1
[c834827a] + Xorg_libSM_jll v1.2.3+0
[4f6342f7] + Xorg_libX11_jll v1.8.6+0
[0c0b7dd1] + Xorg_libXau_jll v1.0.11+0
[935fb764] + Xorg_libXcursor_jll v1.2.0+4
[a3789734] + Xorg_libXdmcp_jll v1.1.4+0
[1082639a] + Xorg_libXext_jll v1.3.4+4
[d091e8ba] + Xorg_libXfixes_jll v5.0.3+4
[a51aa0fd] + Xorg_libXi_jll v1.7.10+4
[d1454406] + Xorg_libXinerama_jll v1.1.4+4
[ec84b674] + Xorg_libXrandr_jll v1.5.2+4
[ea2f1a96] + Xorg_libXrender_jll v0.9.10+4
[14d82f49] + Xorg_libpthread_stubs_jll v0.1.1+0
[c7cfdc94] + Xorg_libxcb_jll v1.15.0+0
[cc61e674] + Xorg_libxkbfile_jll v1.1.2+0
[e920d4aa] + Xorg_xcb_util_cursor_jll v0.1.4+0
[12413925] + Xorg_xcb_util_image_jll v0.4.0+1
[2def613f] + Xorg_xcb_util_jll v0.4.0+1
[975044d2] + Xorg_xcb_util_keysyms_jll v0.4.0+1
[0d47668e] + Xorg_xcb_util_renderutil_jll v0.3.9+1
[c22f9ab0] + Xorg_xcb_util_wm_jll v0.4.1+1
[35661453] + Xorg_xkbcomp_jll v1.4.6+0
[33bec58e] + Xorg_xkeyboard_config_jll v2.39.0+0
[c5fb5394] + Xorg_xtrans_jll v1.5.0+0
[3161d3a3] + Zstd_jll v1.5.5+0
[35ca27e7] + eudev_jll v3.2.9+0
[214eeab7] + fzf_jll v0.43.0+0
[1a1c6b14] + gperf_jll v3.1.1+0
[a4ae2306] + libaom_jll v3.4.0+0
[0ac62f75] + libass_jll v0.15.1+0
[2db6ffa8] + libevdev_jll v1.11.0+0
[f638f0a6] + libfdk_aac_jll v2.0.2+0
[36db933b] + libinput_jll v1.18.0+0
[b53b4c65] + libpng_jll v1.6.40+0
[f27f6e37] + libvorbis_jll v1.3.7+1
[009596ad] + mtdev_jll v1.1.6+0
[1270edf5] + x264_jll v2021.5.5+0
[dfaa095f] + x265_jll v3.5.0+0
[d8fb68d0] + xkbcommon_jll v1.4.1+1
[2f01184e] + SparseArrays v1.10.0
[10745b16] + Statistics v1.10.0
[efcefd7] + PCRE2_jll v10.42.0+1
[bea87d4a] + SuiteSparse_jll v7.2.1+1

```

**Info** Packages marked with  have new versions available but compatibility constraints restrict them from upgrading. To see why use ``status --outdated -m``

**Precompiling** project...

150 dependencies successfully precompiled in 61 seconds. 20 already precompiled.

**julia>** # hit delete to go back to standard mode

**julia>** # hit ; to change to command-line

```
shell> ls
Desktop      Downloads    Movies      Pictures    Public
Documents    Library     Music       Projects
```

```
shell> pwd
/Users/solver
```

```
julia> # you may need to use that to navigate to where you can see MATH50003NumericalAnalysis
```

```
julia> Lets now load Jupyter, which is provided by IJulia
```

```
ERROR: ParseError:
```

```
# Error @ REPL[33]:1:5
```

```
Lets now load Jupyter, which is provided by IJulia
```

```
# _____ — extra tokens after end of expression
```

```
Stacktrace:
```

```
[1] top-level scope
```

```
@ none:1
```

```
julia> # Lets now load Jupyter, which is provided by IJulia
```

```
julia> using IJulia
```

```
julia> notebook() # starts a Jupyter server
```