GNU APL

on Macintosh.
A brief installation guide
by

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Version 1.03 Page 10 and 11 revised on 14 August 2014
- to use new URL for the Dyalog fonts
-and MacAplAlt.keylayout provided with the release

Version 1.02 Pages 4 and 5 revised on 2 May 2014
- to point to latest release url
Version 1.01 Page 11 items (2) and (3) revised on 22 March 2014
-better terminal instructions

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Introduction

For a long time I've been looking for a way to run APL on my Mac. There were and are a number of implementations, both commercial and free, but the ones I tried didn't satisfy me. Not their fault - just my pickiness.

In the last little while I had a programming problem that was going to be fairly easily solved using APL as opposed to C++, C, or Obj-C. So I revisited what solutions there might be for APL. Like so much in life, timing is important and this time I lucked out by finding GNU APL at http://www.gnu.org/software/apl/.

Dr Jürgen Sauermann has made a recent implementation of the ISO standard 13751 *[aka. Programming Language APL, Extended]*. By recent I mean October 10 2013, the earliest date shown on the above website. It only took me a few scattered hours, over a couple of days, to get it installed and working like a charm. And it's scriptable!!!

Essentially there were only 2 issues - *building and installing it* and *setting up the keyboard*. Below are instructions based on my experience. YMMV.

Building & Installing

For those familiar with using Xcode and Terminal for developing on the Mac, go to the section Quick Start on page 4 for the steps I used to successfully build and install everything. For a more detailed approach please go to the Detailed Build section on page 5.

Quick Start

(0) Download the current stable release zipped tar ball, usually named apl-<version>.tar.gz, which you can get from the home site, `ftp://ftp.gnu.org/gnu/apl/`. Optionally also download the corresponding apl-<version>.tar.gz.sig and verify that the download has not been corrupted - a wise thing to do IMHO.

If you prefer the most current source you can get that from `http://svn.savannah.gnu.org/svn/apl/trunk` (see details at `http://www.gnu.org/software/apl/`).

(1) Use Terminal to unzip and decompress the tar.

(2) My current environment is OS X Mountain Lion 10.8.5 and Xcode 5.1.1.[1]When I installed Xcode I didn't bother with the Command Line Tools. You need to install them if you haven't already done so. See Obtaining the Xcode Command Line Tools on page 8.

Incidentally I was also able to build and install in OS X Lion 10.7.6 which is how I discovered the need to install the CL tools. In Lion GCC was installed as part of Xcode. Not so in ML - see this note in the "What's New in Xcode" document - "NOTE: LLVM_GCC is not included in Xcode 5."

[1]this also applies to Mavericks

(3) Assuming you are already in the correct directory perform the classic build steps: `./configure, make, [make check], make install, [make installcheck]`. If all this worked for you go to the Keyboard Setup section on page 10.

Detailed build

This section assumes you are a somewhat experienced programmer but are new to Macintosh and OS X.[2] If you are an experienced Unix or Linux user then there won't be much of a learning curve because OS X is a *nix OS based on XNU.[3]

If you are coming from a Windows environment you will have quite a bit more to understand and this section only gives you the barest outlines. So lets get started.

(0) Download *It's up to you where you choose to put these files.*[4]Your browser, by default, is usually configured to place downloads in your Home directory in the Downloads folder [see Finder Go menu]

Download the current stable release zipped tar ball, usually named apl-<version>.tar.gz, which you can get from the home site, `ftp://ftp.gnu.org/gnu/apl/`. Optionally also download the corresponding apl-<version>.tar.gz.sig and verify that the download has not been corrupted - a wise thing to do IMHO.[5]

[2]Otherwise why would you want an interpreter for A Programming Language?

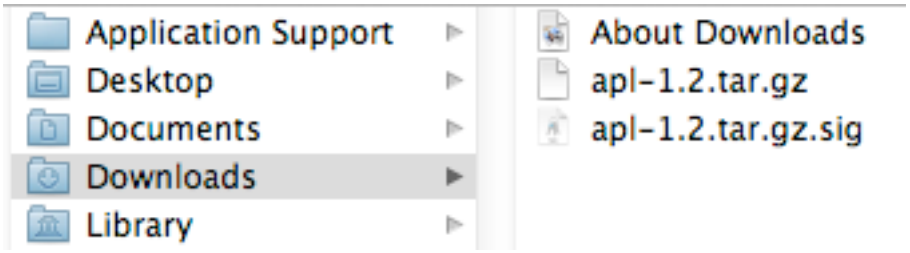
[3]http://en.wikipedia.org/wiki/XNU

[4]My code is on a separate drive and available to all releases of OS X.

[5] If you don't know how to do this on Mac go to `https://gpgtools.org/gpgsuite.html` as a starting point.

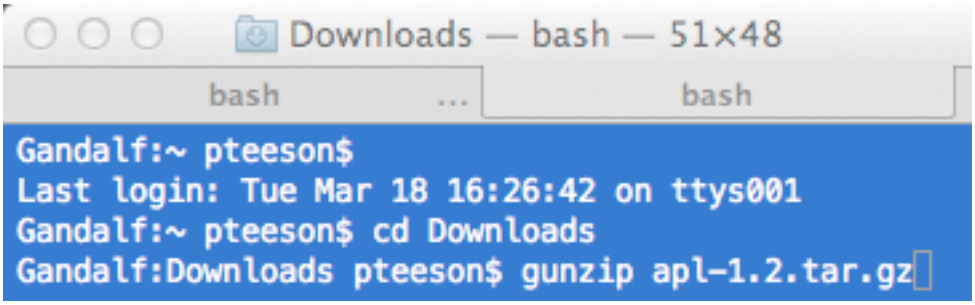
If you prefer the most current source you can get that from http://svn.savannah.gnu.org/svn/apl/trunk (see details at http://www.gnu.org/software/apl/).

Navigate to your Downloads folder by selecting it from the Finder Go menu. If you've done this correctly you'll see something like this:

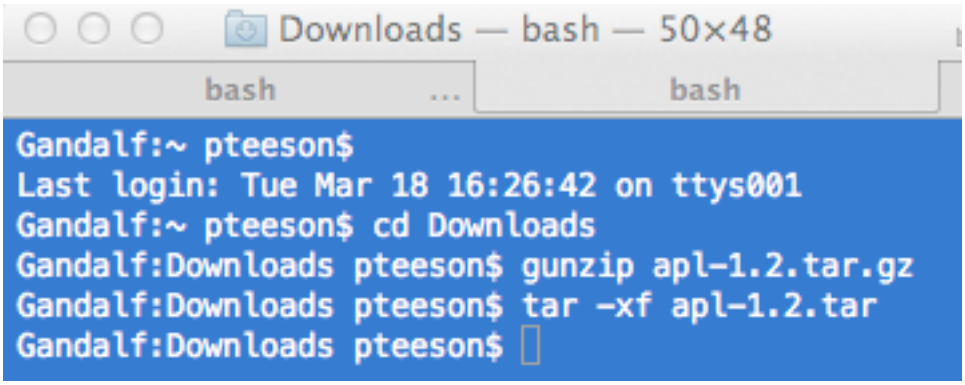


(1) Terminal Now we have the files we can open a Terminal window because we want to unzip the file and decompress the tar. It's located in the Utilities folder [see Finder Go menu]. Double click on it to launch it. Note the ~ because by default Terminal will open a window on your Home directory.

We actually want the Downloads directory where the files are, so type `cd Downloads` and press enter. Now type `gunzip apl-<version>.tar.gz` and press enter. If you've done it correctly you will see something similar to this:

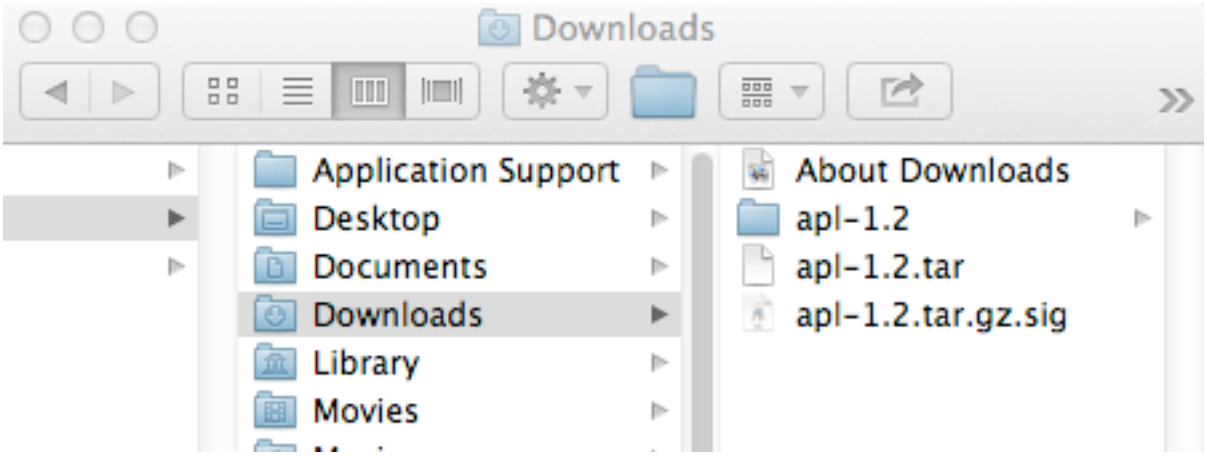


Press the enter key to unzip the file. Then type `tar -xf apl-<version>.tar`.You should now see this in Terminal:



Again click in the Finder and from the Go menu choose Downloads.

Note that the .tar file no longer has the .gz extension. Also note the new folder labelled `apl-<version>`.



Now we are ready to build but we need Apple's Xcode Command Line Tools.[6]

[6]It's the easiest way to proceed. If you don't want to use them you're on your own

(2) Obtaining and installing the Xcode Command Line Tools

To do this you need to have an AppleID. If you have more than one any one of them should work. In your browser go to `https://developer.apple.com/downloads/index.action`. You will be presented with a login window. If you already have an ID just login. Otherwise register for one.

You should then be at the download page which looks like this:

Uncheck all the Categories in the left hand pane except Developer Tools. Select the most recent version of the Command Line Tools *for your version of OS X*, scrolling down if necessary, and download them.

In your Downloads folder you should see a file named like this:
`commandline_tools_os_x_mountain_lion_for_xcode__march_2014.dmg`

Double click on the file to mount it and on the .mpkg file to launch the installer and press the `Continue` button. Assuming everything was installed you are now ready to build GNU APL.

Click on the Terminal window because we want to type these commands, in sequence, pressing enter after each one. The ones in brackets are optional but recommended.

```
./configure
make
[make check]
make install
[make installcheck]
```

If everything has worked we can check it by typing `apl` or `APL`. You should see a welcome screen. Type `)off` or `)OFF` to exit the interpreter. This completes the Build & Install phase. We now need to setup the keyboard for APL.

Keyboard Setup

To make the keyboard work correctly with the APL interpreter we need two things - a correct APL font and a mapping of the keyboard key codes. Fortunately these are both available. The fonts I used are from http://dyalog.com/apl-font-keyboard.htm. Here is a quote from that page:

```
This page contains resources that are believed to be of general interes
The fonts are freely available to everyone, irrespective of whether you
(or any other APL system for that matter).
```

Indeed they are and we applaud their generosity in making them available.

(1) Installing the APL Fonts. Download the APL385 font, and also APL333 if you want a proportional version. You can save them in your usual download place and manually install them. Alterately when prompted select the default `Open with Font Book`. Installing it in `/Library/Fonts/` will make it available to all Accounts on this computer. In my case I placed it in my user account at `~/Library/Fonts/` instead. That was easy.

(2) A keyboard layout. There is one available on the same web page but it is for UK Dyalog users. For GNU APL there is a recommended one provided in the distribution which fully matches that displayed with the]keyb command. You can find it in the support-files folder in the folder named OS-X-keyboard.

You install it by copying it to `/Library/Keyboard Layouts` which makes it available for all users or `~/Library/Keyboard Layouts` for just that user.

(3) Terminal Settings The supplement gives instructions for these. However you might not want to use those for your default Terminal use. My personal preference is to make a new Tab or Window from the `Shell` menu by selecting `New Tab` or `New Window` and then choosing `MacAplAlt`

(4) Using Terminal with APL Start a Terminal window and, from the Input Source (a.k.a. Language) menu, *top right on the Menu Bar*, select `Dyalog Alt`. Also select `Show Keyboard Viewer` from the same menu. Now you can see the key mappings; press the alt key and voila your familiar APL symbols. Try Shift+Alt to get the rest. Type `apl` in the terminal window and enjoy.