



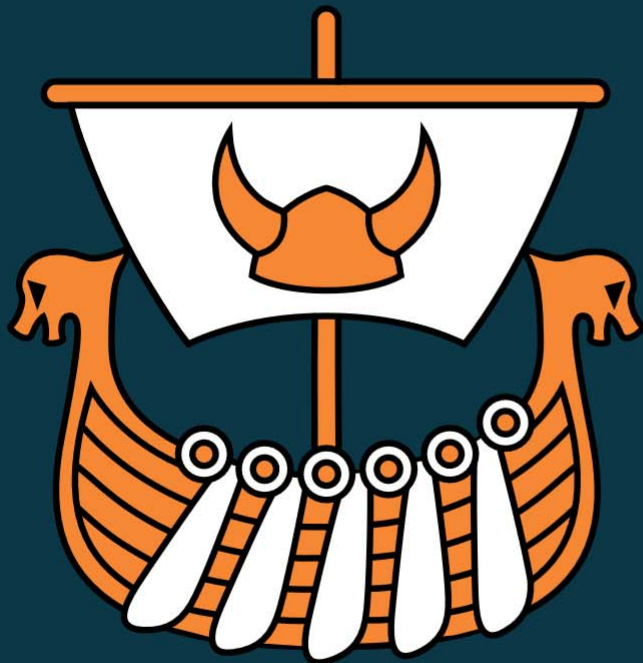
DYALOG



APL Germany

New Ways of Working With APL 2021 Update

Morten Kromberg, CTO, Dyalog Ltd



DYALOG

New Ways of Working with APL

Morten Kromberg, CXO, Dyalog

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Stuttgart, May 14th 2019

New Ways of Working with APL

1. Source Code
in Text Files

3. Creating and Using
Simple Services

2. Running on
Multiple Platforms

4. Cloud Computing



Why is Text

• Sigh...

Source Code Mgt Demo

- All tools shown here downloaded from internet, none of them knew about APL in any way.

```

C:\Users\vmkrom\AppData\Local\Temp\MyApp.dyalog-revBASE.svn001.tmp.dyalog
:Namespace MyApp
A This is a Very Simple Application done for APL Germany

U+##.U A Make a Link to Utils

  ▽ Main:Berlin
  'Berlin'⎕WC'Form' 'Hello World!'('Size'(35 200))('Coo
  'Berlin.OK'⎕WC'Button'(U.ucase'ok')(10 10)(θ 100)('Eve
  ⎕DQ'Berlin'
  A I think this is a mistake
  ⎕OFF
  ▽
:EndNamespace

10-10-2008 11:04:01 WIN UTF8 Ln 4 Col 1

C:\myapp\MyApp.dyalog
:Namespace MyApp
A This is a Very Simple Application done for APL Germany

U+##.U A Link to Utils

  ▽ Main:Berlin
  'Berlin'⎕WC'Form' 'Hello Berlin!'('Size'(35 200))('Coo
  'Berlin.OK'⎕WC'Button'(U.ucase'ok')(10 10)(θ 100)('Eve
  ⎕DQ'Berlin'
  ⎕DQ'Berlin'
  ⎕OFF
  ▽
:EndNamespace

10-10-2008 10:21:59 WIN UTF8 Ln 4 Col 1
Source Only (1) Dest only Changed (2) EDIT OVR CAPS NUM
  
```



Why is Text **IMPORTANT** ?

- With source code in text files we can use *extremely* attractive tools developed outside the APL community
 - Tools for editing, comparing, mergeing, refactoring, sharing, building, testing, computing statistics, ...
- ... in addition to all our own tools



Visual Studio Code



Jenkins



Why is Text **IMPORTANT** ?



File Edit Selection View Go Debug Terminal Help FileSystemWatcher.apln (0f00180) ↔ FileSystemWatcher.apln (2e934c5) - Link - Visual Studio Code

GITLENS

REPOSITORIES

- Link master 251 0t • ~4 -1 • Last fetched 9:29pm...
- master 251 0t ⇌ origin/master
 - Over a month ago
 - Handle listing links with no linked members ...
 - Don't init globals +0 ~1 -0 • abrudz, 2 months...
 - Exception trap +0 ~1 -0 • abrudz, 2 months ago
 - Merge branch 'master' of https://github.com...
 - Add general casing util +0 ~1 -0 • abrudz, 2 ...
 - Actually apply the case code, not just remov...
 - Fix #74 +0 ~1 -0 • abrudz, 2 months ago
 - Fixes #75: Src files incorrectly updated after)...
 - Fixes #77: FileSystemWatcher threading issu...
 - FileSystemWatcher.apln StartupS...**
 - Fixed #76: Add "ViewMetaData" +1 ~0 -0 • Y...
 - Show More Commits
 - 25 commits behind
 - 5 files changed
 - Compare master (working) with <branch, tag, ...

FILE HISTORY

LINE HISTORY

COMPARE

SEARCH COMMITS

FileSystemWatcher.apln (0f00180) ↔ FileSystemWatcher.apln (2e934c5)

```

c: > Devt > Link > StartupSession > Link > FileSystemWatcher.apln
27 r+LNEM Disposable watcher A wrap a de: 27 r+LNEM Disposable watcher A wrap
28 r.[DF 1φ']['',##.U.WinSlash>args 28 r.[DF 1φ']['',##.U.WinSlash>args
29
29
30 :Class Disposable 30 :Class Disposable
31 :Field Public Object 31 :Field Public Object
32
32
33 :Access Public 33 :Access Public
34 :Implements Constructor 34 :Implements Constructor
35 Object+ref 35 Object+ref
36
36
37 :do_dispose ref 37 :do_dispose ref
38 :Trap 0 38 :Trap 0
39 | ref.Dispose 39 | ref.Dispose
40 :EndTrap 40 :EndTrap
41
41
42 - :do_dispose;tid 42 + :do_dispose You, 2 months a
43 :Implements Destructor 43 :Implements Destructor
44 Object.EnableRaisingEvents+0 44 Object.EnableRaisingEvents+0
45 - tid+do_dispose&Object 45 + do_dispose Object
46
46
47 :EndClass 47 :EndClass
48 :EndNamespace 48 :EndNamespace
49
49

```

Ln 42, Col 1 Spaces: 2 UTF-8 with BOM APL

Fixes #77: FileSystemWatcher thr...

GitHub, Inc. [US] | github.com/Dyalog/link/commit/2e934c527ce73dd77de79477fcb028ce2b56506

Search or jump to... Pull requests Issues Marketplace Explore

Dyalog / link Unwatch 9 Star 4 Fork 2

Code Issues 19 Pull requests 0 Projects 0 Wiki Security Insights Settings

Fixes #77: FileSystemWatcher threading issue

master [Browse files](#)

mkromberg committed on Jun 19 1 parent 767c3d0 commit 2e934c527ce73dd77de79477fcb028ce2b56506

Showing 1 changed file with 2 additions and 2 deletions. [Unified](#) [Split](#)

4 StartupSession/Link/FileSystemWatcher.apln

39	ref.Dispose	39	ref.Dispose
40	:EndTrap	40	:EndTrap
41	▽	41	▽
42	- dispose,tid	42	+ dispose
43	:Implements Destructor	43	:Implements Destructor
44	Object.EnableRaisingEvents+0	44	Object.EnableRaisingEvents+0
45	- tid=do_dispose&Object	45	+ do_dispose Object
46	▽	46	▽
47	:EndClass	47	:EndClass
48	:EndNamespace	48	:EndNamespace

Groups of Users - Requirements

Established users need to follow IT "best practices"

- Cloud Computing
- Continuous Integration Pipelines
- Secure, containerised deployment
- Make it easier to attract and employ new APLers (see below)

New Users Expect

- All of the above (fortunately)
- Modern, on line training materials
- A lively on line community
- Open-source tools they can see and contribute to
- Ability to combine APL with Python, etc...

Using Text for

- APL source
- APL Configuration
- APL Documentation ("markdown")

... makes ALL of this easier!

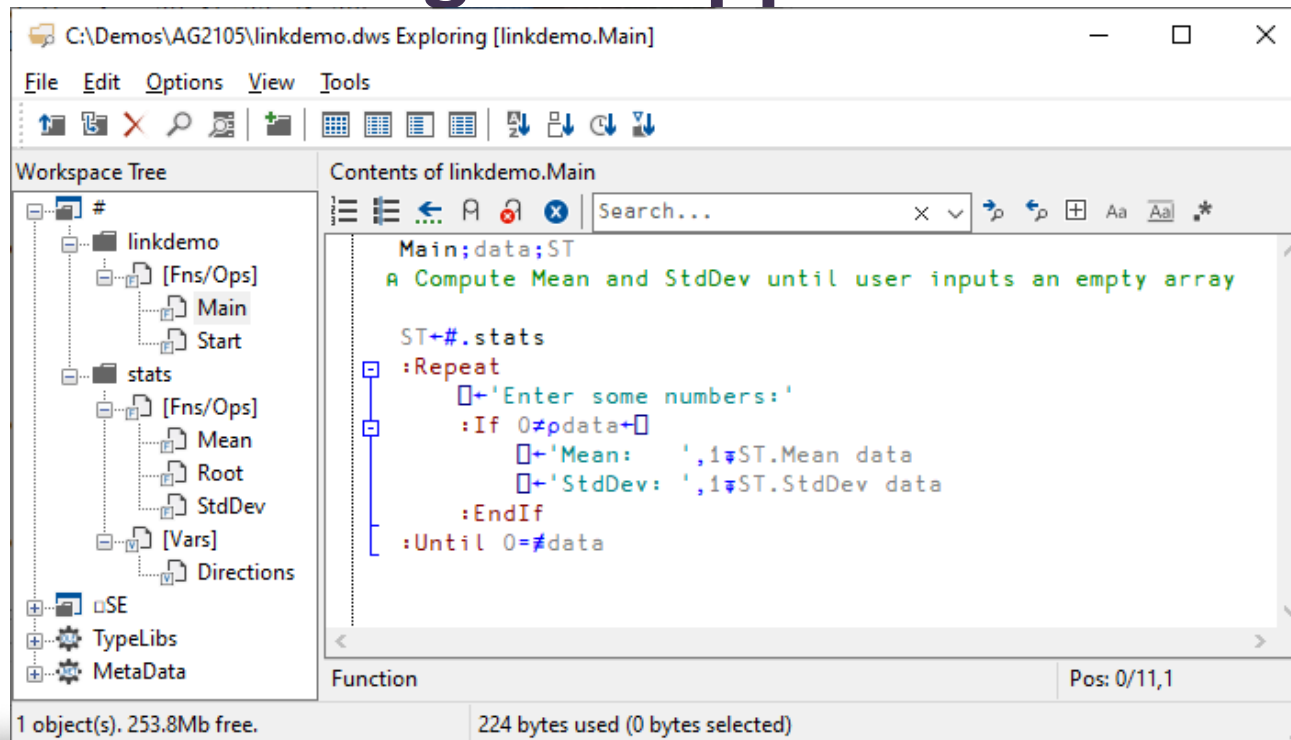


Using Text Files to Manage APL Processes

- Pre-18.0 interpreters can be launched on
 - a binary workspace (.dws)
 - a "dyalog application file" (.dyapp) primitive text format, now deprecated
- Version 18.0 adds
 - Functions (.aplf)
 - Namespaces (.aplN)
 - Classes (.aplc)
 - Configuration files (.dcfg)
- Version 18.1 adds
 - Shebang (!) scripts



Introducing the Application



The screenshot shows the Dyalog APL IDE interface. The title bar indicates the file path: C:\Demos\AG2105\linkdemo.dws Exploring [linkdemo.Main]. The menu bar includes File, Edit, Options, View, and Tools. The toolbar contains various icons for file operations and editing. The Workspace Tree on the left shows a hierarchical structure with a root node #, containing linkdemo and stats namespaces. The linkdemo namespace includes [Fns/Ops], Main, and Start. The stats namespace includes [Fns/Ops], Mean, Root, StdDev, [Vars], and Directions. The SE, TypeLibs, and MetaData nodes are also visible. The main editor window displays the contents of linkdemo.Main, which is a function named Main that computes the mean and standard deviation of an array of numbers until the user inputs an empty array. The code is as follows:

```
Main;data;ST
A Compute Mean and StdDev until user inputs an empty array

ST+#.stats
:Repeat
  ⎕←'Enter some numbers:'
  :If 0≠pdata+⎕
    ⎕←'Mean: ',1⌶ST.Mean data
    ⎕←'StdDev: ',1⌶ST.StdDev data
  :EndIf
:Until 0≠#data
```

The status bar at the bottom shows 1 object(s), 253.8Mb free, and 224 bytes used (0 bytes selected). The position indicator shows Pos: 0/11,1.

Two Namespaces

- linkdemo:
main application
- stats:
statistics library



Demos / Cases

1. Introducing the application



Introducing

```
Administrator: Command Prompt
C:\Demos\AG2105>dyalog -x linkdemo
C:\Demos\AG2105>
```

C:\Demos\AG2105\linkdemo.dws Exploring [linkdemo.Main]

File Edit Options View Tools

Workspace Tree

- #
 - linkdemo
 - [Fns/Ops]
 - Main
 - Start
 - stats
 - [Fns/Ops]
 - Mean
 - Root
 - StdDev
 - [Vars]
 - Directions
- USE
- TypeLibs
- MetaData

Contents of linkdemo.Main

```

Main;data;ST
A Compute Mean and StdDev until user inputs an empty

ST+#.stats
:Repeat
  + 'Enter some numbers:'
  :If 0≠pdata+
    + 'Mean: ',1≠ST.Mean data
    + 'StdDev: ',1≠ST.StdDev data
  :EndIf
:Until 0=≠data
    
```

Function Pos: 0/11

1 object(s). 253.8Mb free. 224 bytes used (0 bytes selected)

.linkdemo.dws (linkdemo)- Dyalog APL/W-64

File Edit View Windows Session Log Action Options Tools
Threads Help

WS Object Tool Edit Session

Language Bar

Dyalog APL/W-64 Version 18.1.40465
Serial number: 000013 - pre-release software
Mon May 3 19:34:38 2021
.linkdemo.dws saved Mon May 3 19:29:49 2021

```

#linkdemo.Start 1
  VR 'linkdemo.Start'
  Start run
  [1] IO+ML+1
  [2]
  [3] :If run
  [4]   Main
  [5]   OFF
  [6] :EndIf
  lx
Enter some numbers:
:
  1 4 2 3 7
Mean: 3.4
StdDev: 2.1
Enter some numbers:
:
  0
    
```

Debugger

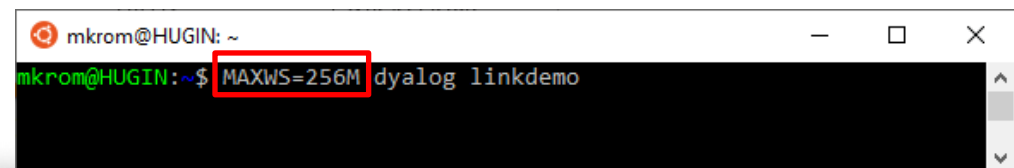
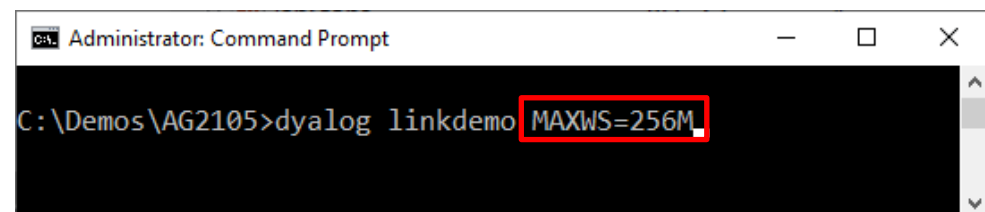
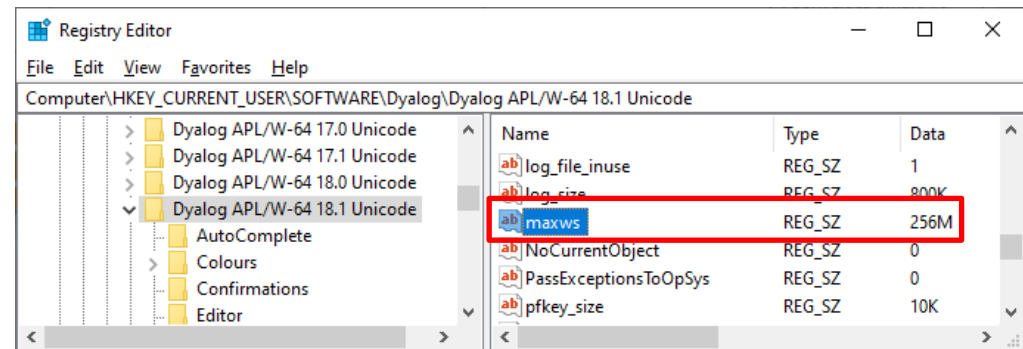
Ready... Ins NUM

CurObj 8:1 □DQ:0 □TRAP □SI:2 □IO:1 □ML:1



Configuration Mechanisms

- Windows Registry
- Win/DOS Command Line
- 'Nix Environment Vars

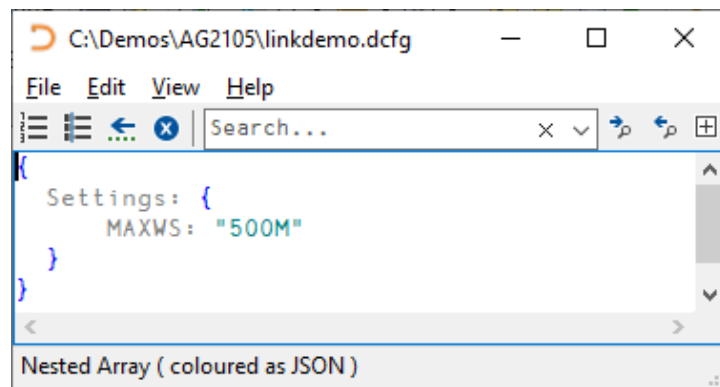


Demos / Cases

1. Introducing the application
2. Configuring the Interpreter with Text



Configuration Files



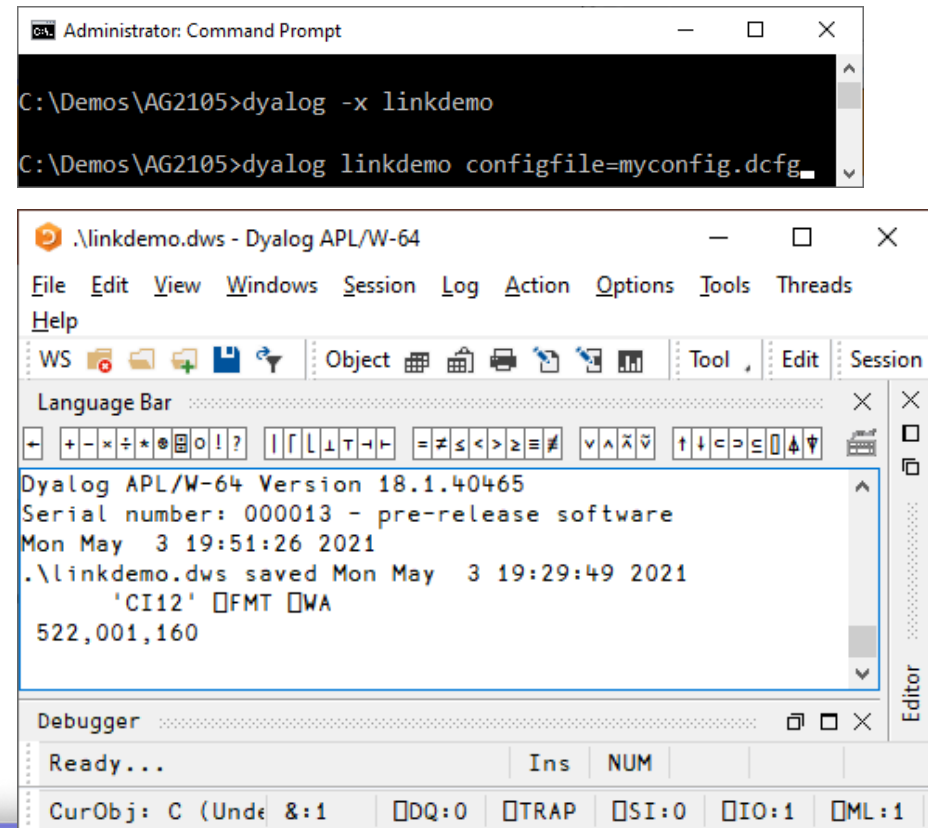
```

Settings: {
  MAXWS: "500M"
}

```

Nested Array (coloured as JSON)

If a config file with the same name as the workspace exists, it is used →



Administrator: Command Prompt

```

C:\Demos\AG2105>dyalog -x linkdemo
C:\Demos\AG2105>dyalog linkdemo configfile=myconfig.dcfg_

```

.\linkdemo.dws - Dyalog APL/W-64

```

Dyalog APL/W-64 Version 18.1.40465
Serial number: 000013 - pre-release software
Mon May  3 19:51:26 2021
.\linkdemo.dws saved Mon May  3 19:29:49 2021
'CI12'  FMT  WA
522,001,160

```

Debugger

```

Ready...
CurObj: C (Unde &:1  DQ:0  TRAP  SI:0  IO:1  ML:1

```



Configuration Files can *Cascade*

```
Client.dcfg - Notepad
File Edit Format View Help
{ extend: "App.dcfg",
  settings: {
    /* Application Client Configuration */
    app_server_address: "localhost",
  }
}
```

maxws
app_server_port
use_secure_sockets
are decided by
App.dcfg

app_server_address
by Client.dcfg

```
App.dcfg - Notepad
File Edit Format View Help
{ Settings: {
  /* Dyalog Configuration */
  maxws: "128M",
  /* Application Configuration */
  app_server_port: 5556,
  use_secure_sockets: 1,
}
```

```
Server.dcfg - Notepad
File Edit Format View Help
{ extend: "App.dcfg",
  settings: {
    /* Dyalog Configuration */
    maxws: "1G",
    /* Application Server Configuration */
    server_debug: 1,
  }
}
```

Server.dcfg
overrides
the maxws setting

More about configuration files at
dyalog.tv "Highlights of v18.0"



Demos / Cases

1. Introducing the application
2. Configuring the Interpreter with Text
3. Run one function



```
helloworld.aplf - Notepad
File Edit Format View Help
helloworld dummy

⎕←'Hello World! ⎕WA=',,'CI12' ⎕FMT ⎕WA
```

```
C:\Demos\AG2105\helloworld.dcfg
File Edit View Help
Search...
[
  Settings: {
    MAXWS: "500M"
  }
]
Nested Array ( coloured as JSON )
```

```
Select Administrator: Command Prompt
C:\Demos\AG2105>dyalog load=helloworld.aplf
C:\Demos\AG2105>
```

CLEAR WS - Dyalog APL/W-64

File Edit View Windows Session Log Action Options Tools Threads Help

WS Object Tool Edit Session

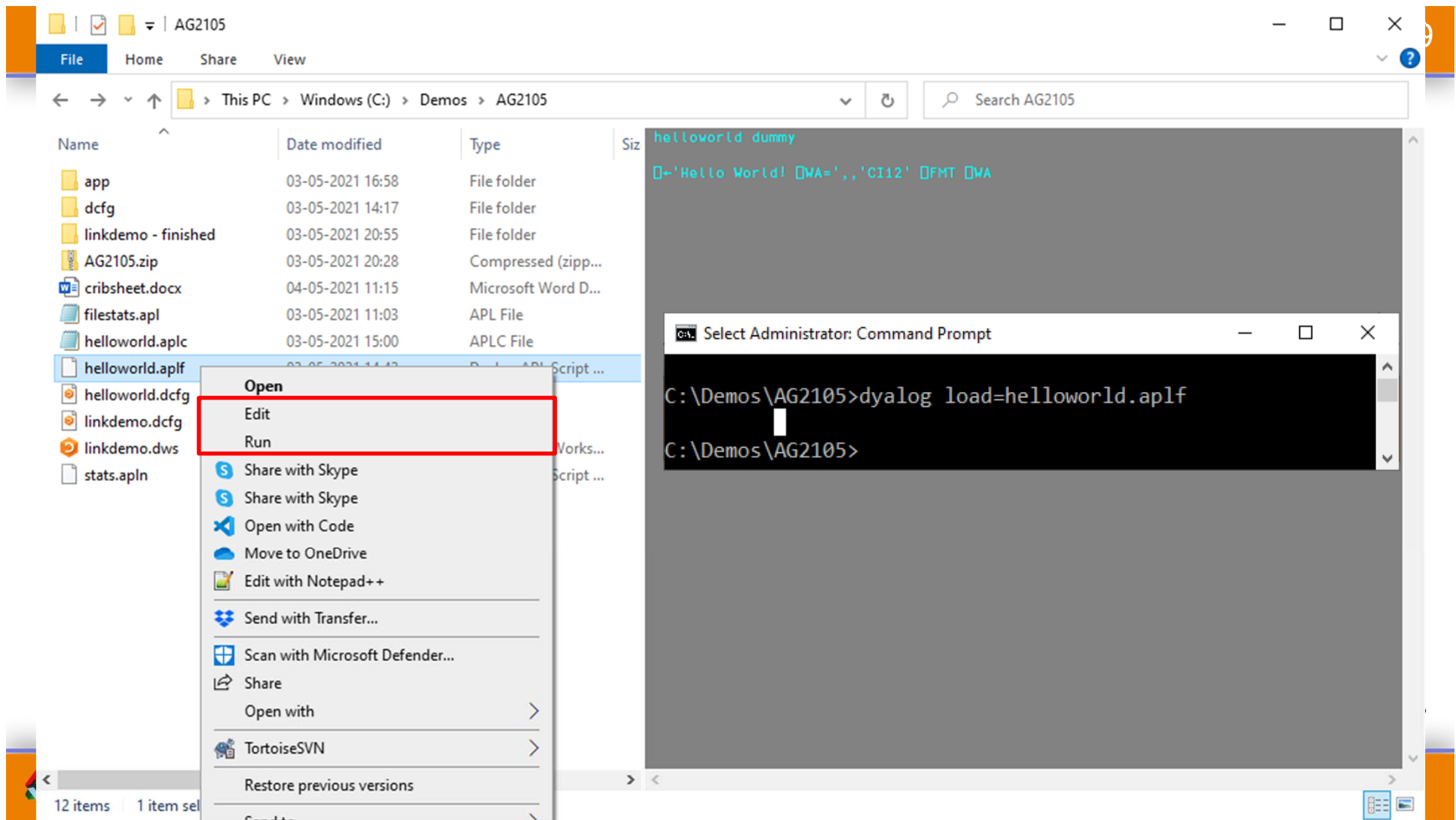
Language Bar

```
Dyalog APL/W-64 Version 18.1.40465
Serial number: 000013 - pre-release software
Mon May 3 20:07:49 2021
Hello World! ⎕WA= 522,011,720
```

Debugger

Ready...

CurObj: &:1 ⎕DQ:0 ⎕TRAP ⎕SI:0 ⎕IO:1 ⎕ML:1



Demos / Cases

1. Introducing the application
2. Configuring the Interpreter with Text
3. Run one Function (and show config files also apply)
4. Run one Class



```

helloworld.aplc - Notepad
File Edit Format View Help
:Class helloworld

  ML+3 A Germany

  Run dummy;Z
  :Access Shared Public

  ←''
  ←↑'__de__"Hello Germany," hh:mm "UTC" dddd'(1200±) 1 DT'Z'
  ←'WA=',, 'CI12' FMT WA
  ←''
  ←'Press enter...' ⋄ Z←
  ←'' 'bye...'
  DL 3
  OFF
  ▽

:EndClass
    
```

```

Administrator: Command Prompt
C:\Demos\AG2105>dyalog load=helloworld.aplc
C:\Demos\AG2105>
    
```

CLEAR WS - Dyalog APL/W-64

File Edit View Windows Session Log Action Options Tools Threads Help

WS Object Tool Edit Session

Language Bar

Dyalog APL/W-64 Version 18.1.40465
 Serial number: 000013 - pre-release software
 Mon May 3 20:07:49 2021
 Hello World! WA= 522,011,720

Debugger Ready... Ins NUM

CurObj: &:1 DQ:0 TRAP SI:0 IO:1 ML:1



Demos / Cases

1. Introducing the application
2. Configuring the Interpreter with Text
3. Run one Function (and show config files also apply)
4. Run one Class
5. Run one Namespace



C:\Demos\AG2105\stats.apln

File Edit View Help

Search...

#:Namespace.C:\Dem

- [Methods]
- ... Run
- [Namespaces]
- ST
- [Methods]
- Mean
- Root
- StdDev

```
:Namespace stats
  IO+ML+1
  :Namespace ST A Statistics functions
    [0] mean+Mean vals;sum
    [1] sum++f,vals
    [2] mean+sum+1f p,vals
    [3]
    [0] Root+{α+2
    [1] ω*÷α}
    StdDev+{2 Root (+.*÷p), ω-Mean ω}
  :EndNamespace
  [0] Run dummy;data
  [1] A Compute Mean and StdDev until user inputs an empty array
  [2]
  [3] :Repeat
  [4]   '+'Enter some numbers:'
  [5]   :If 0≠pdata+
  [6]     '+'Mean: ',1fST.Mean data
  [7]     '+'StdDev: ',1fST.StdDev data
  [8]   :EndIf
  [9]   :Until 0= #data
  [10]  OFF
  [11]
  :EndNamespace
```

Namespace Pos: 4/33,0

Administrator: Command Prompt

```
C:\Demos\AG2105>dyalog load=stats.apln
C:\Demos\AG2105>
```

CLEAR WS (stats)- Dyalog APL/W-64

File Edit View Windows Session Log Action Options Tools

Threads Help

WS Object Tool Edit Session

Language Bar

Dyalog APL/W-64 Version 18.1.40465
Serial number: 000013 - pre-release software
Mon May 3 20:19:36 2021

Enter some numbers:
[]: 1 4 2 7 9 2
Mean: 4.2
StdDev: 2.9

Enter some numbers:
[]: 0

Debugger

Ready... Ins NUM

CurOb &:1 []DQ:0 []TRAP []SI:1 []IO:1 []ML:1



Demos / Cases

1. Introducing the application
2. Configuring the Interpreter with Text
3. Run one Function (and show config files also apply)
4. Run one Class
5. Run one Namespace
6. Launch a Script



"Shebang" scripting New in Version 18.1

- Shebang (#!) scripts are a standard 'Nix mechanism
- Shebang scripts begin with #!
Followed by the interpreter name
- The interpreter executes the script as if typed by a user

```

/home/mkrom/filestats.apl - mkrom@odin - Editor - WinSCP
Encoding Color
#!/usr/local/bin/dyalogscript

▽ r←Report txt;start;end
r←txt                               Ⓜ Vec-of-vecs to matrix
| (start end)←3↓5↑! ' =r[1;],' ' Ⓜ Start and End of 5th column
r←2>□VFI,start↓[2] end↑[2] r Ⓜ Validate and fix input
r←'Avg size: ' 'Stddev:','CI12' □FMT r(Mean,StdDev)r
▽

Ⓜ --- Statistics Functions ---

▽ mean←Mean vals;sum
sum←+/vals
mean←sum÷1↑p,vals
▽

Root←{α←2
      ω*+α}

StdDev←{2 Root (+,x~÷p), ω-Mean ω}

Ⓜ --- I/O Utilities

▽ r←ReadInput
Ⓜ Collect all input (until EOF)
r←0p␣''
:Trap 1005 Ⓜ EOF
:Repeat
  r,←␣
:EndRepeat
:EndTrap
▽

Ⓜ --- Here we go!

□←Report ReadInput

Line: 5/36 Column: 1 Character: 32 (0x20) Encoding: U

```

```

mkrom@thor8: ~
mkrom@thor8:~$
mkrom@thor8:~$ ls *.dws -al
-rw-r--r-- 1 mkrom mkrom 35528 Apr 10 2020 Boot.dws
-rw-rw-r-- 1 mkrom mkrom 61336 Apr 6 2020 fswtest2.dws
-rw-rw-r-- 1 mkrom mkrom 51272 Mar 3 2020 fswtest.dws
mkrom@thor8:~$
mkrom@thor8:~$ ls -al | ./filestats.apl
Avg size:          15,240
Stddev:            3,691
mkrom@thor8:~$

```

Demos / Cases

1. Introducing the application
2. Configuring the Interpreter with Text
3. Run one Function (and show config files also apply)
4. Run one Class
5. Run one Namespace
6. Launch a Script (and modify it?)
7. Launch a Docker Container



```
Administrator: Command Prompt
C:\Dev\docker>docker run -v c:\Demos\AG2105\app:/app dyalog/dyalog:18.1
DIALOG
https://www.dyalog.com
*****
* This software is for non-commercial evaluation ONLY *
* https://www.dyalog.com/uploads/documents/Private_Personal_Educational_Licence.pdf *
*****
found aplf file Launching with LOAD=/app/helloworld.aplf
Dyalog APL/S-64 Version 18.1.39961
Serial number: UNREGISTERED - not for commercial use
+-----+
| Dyalog is free for non-commercial use but is not free software. |
| A non-commercial licence can be used for experiments and       |
| proof of concept until the point in time that it is of value.  |
| For further information visit                                   |
| https://www.dyalog.com/prices-and-licences.htm                 |
+-----+
Mon May 3 17:17:23 2021
Rebuilding user command cache... done
Hello World! Workspace Available is 266,566,176
APL: Linux-64 18.1.39961.0 S Development
OS: Linux 5.4.72-microsoft-standard-WSL2
C:\Dev\docker>
```

Start Docker Container using Text

`-v C:\Demos\AG2105\app:/app`
 Maps our demo as /app in the container

New folder	New item	Easy access	Properties	Open	History	Select all	Select none	Invert selection
New			Open			Select		

```
helloworld dummy
[]+'Hello World! Workspace Available is ',,'CI12' []FMT []WA
[]+'APL:' 'OS:',;('.' []WG 'APLVersion') ([]SH 'uname -s -r')
[]OFF
```



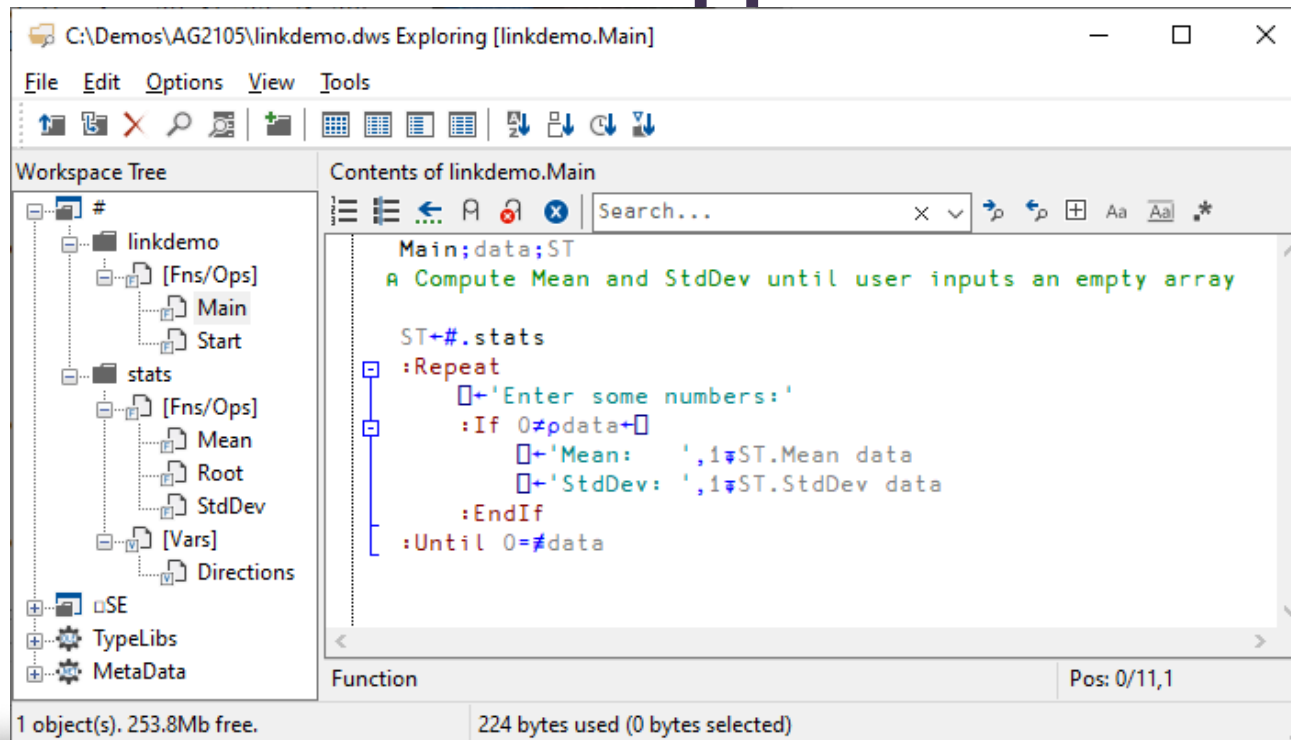
Windows (C:) | Public (P:) | 1 item | 1 item selected 171 bytes

Demos / Cases

1. Introducing the application
2. Configuring the Interpreter with Text
3. Run one Function (and show config files also apply)
4. Run one Class
5. Run one Namespace
6. Launch a Script
7. Launch a Docker Container
8. Switch from Workspaces to Text Files



Remember our Application



The screenshot shows the Dyalog APL IDE interface. The title bar indicates the file path: C:\Demos\AG2105\linkdemo.dws Exploring [linkdemo.Main]. The menu bar includes File, Edit, Options, View, and Tools. The toolbar contains various icons for file operations and editing. The Workspace Tree on the left shows a project structure with folders for linkdemo, stats, and SE, and sub-folders for [Fns/Ops], [Vars], and Directions. The main editor window displays the contents of linkdemo.Main, which is a function that computes the mean and standard deviation of an array of numbers until an empty array is entered. The code is as follows:

```
Main;data;ST
A Compute Mean and StdDev until user inputs an empty array

ST←#.stats
:Repeat
  ⎕←'Enter some numbers:'
  :If 0≠pdata←⎕
    ⎕←'Mean: ',1↖ST.Mean data
    ⎕←'StdDev: ',1↖ST.StdDev data
  :EndIf
:Until 0≠data
```

The status bar at the bottom shows 1 object(s), 253.8Mb free, and 224 bytes used (0 bytes selected).

Two Namespaces

- linkdemo:
main application
- stats:
statistics library



```
Administrator: Command Prompt
C:\Demos\AG2105>dyalog -x linkdemo
C:\Demos\AG2105>
```

.\linkdemo.dws - Dyalog APL/W-64

File Edit View Windows Session Log Action Options Tools Threads Help

WS Object Tool Edit Session

Language Bar

```
Serial number: 000013 - pre-release software
Mon May 3 20:45:14 2021
.\linkdemo.dws saved Mon May 3 19:29:49 2021

]link.export linkdemo c:\demos\ag2105\linkdemo
Exported: #.linkdemo + c:\demos\ag2105\linkdemo

]link.create stats c:\demos\ag2105\stats -arrays
Linked: #.stats ↔ c:\demos\ag2105\stats

]link.add stats.Directions
Added: #.stats.Directions
stats.Directions
Norden Süden Osten Westen
```

Debugger

Ready... Ins NUM

CurObj: stats (&:1 □□DQ:0 □TRAP □SI:0 □IO:1 □ML:1

Editor



One File per FN, One Folder per NS

The screenshot displays the Dyalog APL IDE interface. On the left is the Workspace Tree, showing a project structure with folders for namespaces (NS) and functions (FN). The main workspace contains a folder named 'linkdemo' with subfolders '[Fns/Ops]', 'Main', and 'Start'. Below it is a folder named 'stats' with subfolders '[Fns/Ops]', 'Mean', 'Root', and 'StdDev', and a '[Vars]' folder. At the bottom of the workspace tree, it indicates '1 object(s). 253.8Mb free.'.

Two File Explorer windows are open. The top window shows the 'linkdemo' folder, containing 'Main.aplf' and 'Start.aplf', both 1 KB in size. The bottom window shows the 'stats' folder, containing 'Directions.apla', 'Mean.aplf', 'Root.aplf', and 'StdDev.aplf', all 1 KB in size.

The code editor shows the following APL code in the 'Main' namespace:

```

Main;data
A Compute Mean and StdDev until user inputs an empty array

:Repeat
  ⎕←'Enter some numbers:'
  :If 0≠pdata⎕
    ⎕←'Mean: ',1⍒ST.Mean data
    ⎕←'StdDev: ',1⍒ST.StdDev data
  :EndIf
:Until 0≠#data
    
```

The 'stats' folder contains the following APL code in the 'Mean' namespace:

```

mean←Mean vals;sum
sum←+/vals
mean←sum÷1⍒p,vals
    
```



Booting from Text

- A workspace is not required to launch...

linkdemo - finished

This PC > Windows (C:) > Demos > AG2105 > linkdemo - finished

Name	Date modified	Type	Size
dev.dcfg	05-03-2021 13:06	DCFG File	1 KB
Main.aplf	29-04-2021 15:33	Dyalog APL Script Editing	1 KB
run.dcfg	05-03-2021 13:06	DCFG File	1 KB
Start.aplf	29-04-2021 15:33	Dyalog APL Script Editing	1 KB

```
{  
  Settings: {  
    LX: "linkdemo.Start 0 - [+[]SE.Link.Create 'linkdemo' []SE.Link.LaunchDir"  
  }  
}
```

4 items | 1 item selected 116 bytes



Demos / Cases

1. Introducing the application
2. Configuring the Interpreter with Text
3. Run one Function (and show config files also apply)
4. Run one Class
5. Run one Namespace
6. Launch a Script
7. Launch a Docker Container
8. Switch from Workspaces to Text Files



```

1 diff+{opts}Diff ns;container;link;links;nsref; 1 diff+{opts}Diff ns;container;link;links;nsref;[]IO;[]ML
2 []IO []ML+1 1 2 []IO []ML+1 1
3 :If U.debug=2 3 :If U.debug=2
4 |(1+[]LC)[]STOP=[]SI 4 |(1+[]LC)[]STOP=[]SI
5 :EndIf 5 :EndIf
6 :Trap DEBUG+0 6 :Trap DEBUG+0
7 :Hold '[]SE.Link.Links' 7 :Hold '[]SE.Link.Links'
8- :If 0eplinks+U.GetLinks < U.Error 'Not 8+ :If ~nseplinks+U.GetLinks < U.Error 'Not Linked: ',ns < :End
9 opts+U.DefaultOpts[]NS+0*(900I0)-'opt 9 opts+U.DefaultOpts[]NS+0*(900I0)-'opts' A monadic?
10 (container ns)+([]RSI []XSI) U.Contain 10 (container ns)+([]RSI []XSI) U.ContainerNs ns
11 :if ~(<opts.arrays)ε0 1 < opts.array 11 :if ~(<opts.arrays)ε0 1 < opts.arrays+container U.NormName"o
12- :If ~0eplnsref+(0 U.GetRefTo)ns 12+ :If ~0eplnsref+(0 U.GetRefTo)container
13 :AndIf ~0eplink+links U.LookupRef nsr 13 :AndIf ~0eplink+links U.LookupRef nsref
14 0 Watcher.Pause link A FSW cann 14 0 Watcher.Pause link A FSW cannot kick in because of th
15 link+[]NS link < link.arrays+opts 15 link+[]NS link < link.arrays+opts.arrays
16 diff+U.Diff link 16 diff+U.Diff link
17 1 Watcher.Pause link A TODO : W 17 1 Watcher.Pause link A TODO : WriteFiles/FixFiles unnec
18 :Else 18 :Else
19 U.Error 'Not linked: ',ns 19 U.Error 'Not linked: ',ns
20 :EndIf 20 :EndIf
21 :EndHold 21 :EndHold
22 :Else 22 :Else
23 U.Resignal 1 23 U.Resignal 1
24 :EndTrap 24 :EndTrap
25 25
  
```



End of the Workspace?

NO! Workspaces are still supported!

- Recommended for shipping applications
- NOT recommended for storing source code (but we won't stop you)
- Valuable for crash analysis, but some functionality may be withdrawn:
 - We plan to stop)LOADing wss from other platforms or back versions workspaces *if* they have an)SI stack



Summary

Using Text to Drive APL Processes...

- ◆ Allows APL to be used according to software engineering "best practices"
 - ◆ (Michael will soon show us some more)
- ◆ Keep large corporations happy
- ◆ Make new users happy

- ◆ All without sacrificing our "inalienable APL way of life"



To Learn More

- ◆ Configuration Files, Launching from Text:
Introducing Dyalog Version 18.0
<https://dyalog.tv/Webinar/?v=BSQr203sbWc>
- ◆ Link documentation:
<https://github.com/dyalog/link/readme.md>
- ◆ Check out out other repositories at
<https://github.com/dyalog>
(please contribute changes)

