



DYALOG

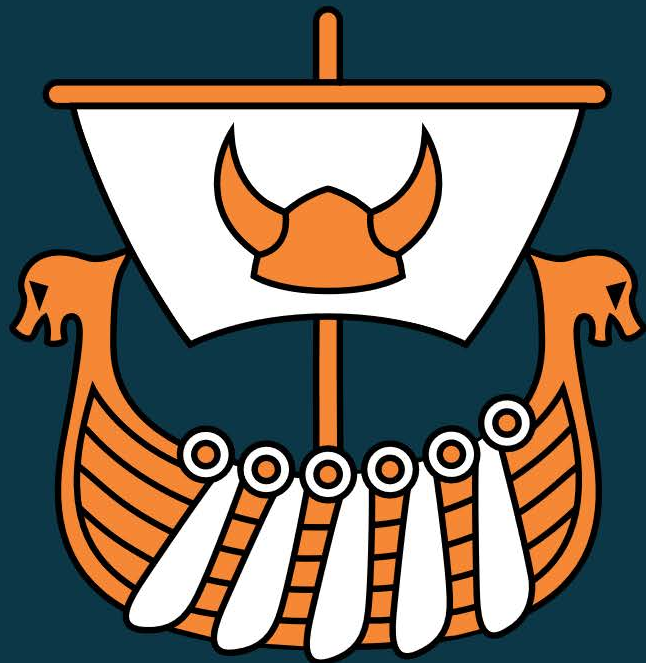


APL Germany

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 **IMPORTANT** ?

● Sigh... -_ (~) _ / -

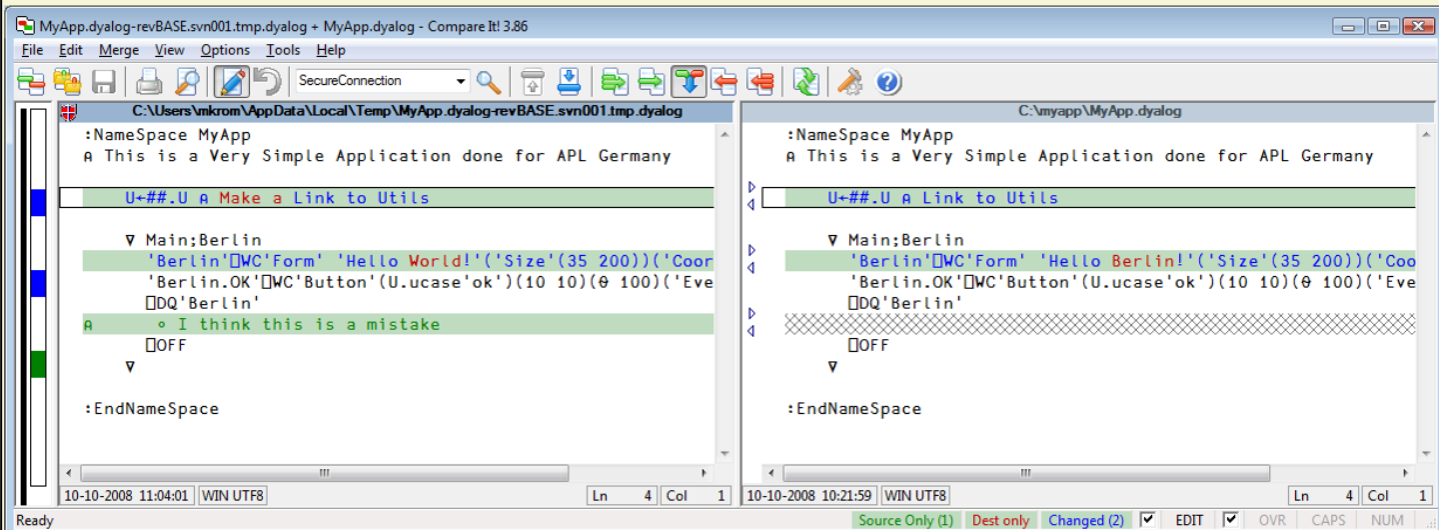


Why is Text...

🟡 Sigh...

Source Code Mgt Demo

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



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

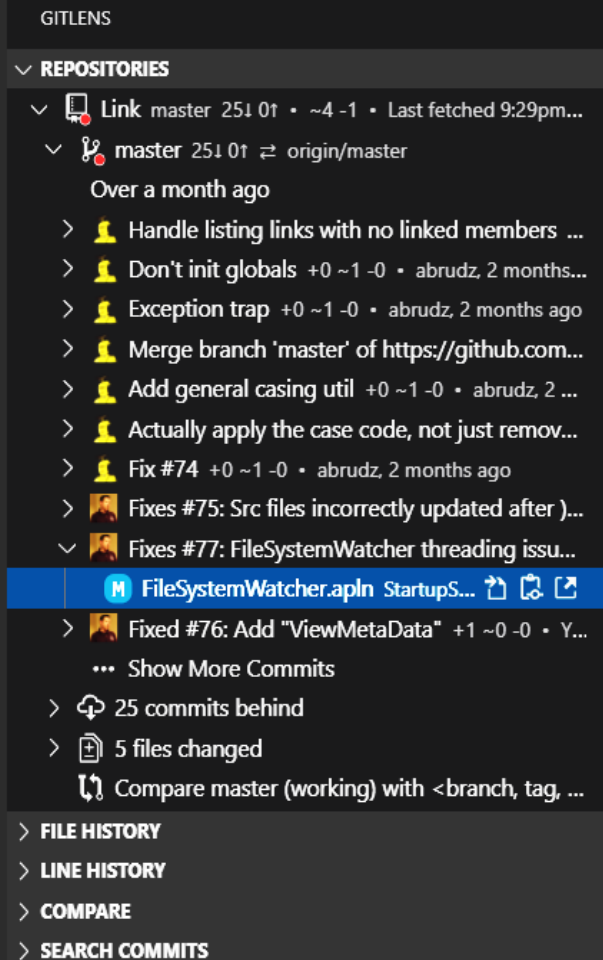


Jenkins



Why is Text **IMPORTANT** ?





```

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

```

Fixes #77: FileSystemWatcher th...

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

Apps mkromberg (Morte... APL kdb - Interprocess... The APL Orchard | c... Git Flying D19

Search or jump to...

Pull requestsIssuesMarketplaceExplore

+

Dyalog / link

Unwatch9

Star4

Fork2

<> Code

Issues19

Pull requests0

Projects0

Wiki

Security

Insights

Settings

Fixes #77: FileSystemWatcher threading issue

Browse files

master

mkromberg committed on Jun 19

1 parent 767c3d0 commit 2e934c527ce73dd77de79477fcb028ce2b56506

Showing 1 changed file with 2 additions and 2 deletions.

UnifiedSplit

4 StartupSession/Link/FileSystemWatcher.apln

@@ -39,10 +39,10 @@

39ref.Dispose

40:EndTrap

41

42- dispose;tid

43:Implements Destructor

44Object.EnableRaisingEvents+0

45- tid-do_dispose&Object

46

47:EndClass

48:EndNamespace

39ref.Dispose

40:EndTrap

41

42+ dispose

43:Implements Destructor

44Object.EnableRaisingEvents+0

45+ do_disposeObject

46

47:EndClass

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!

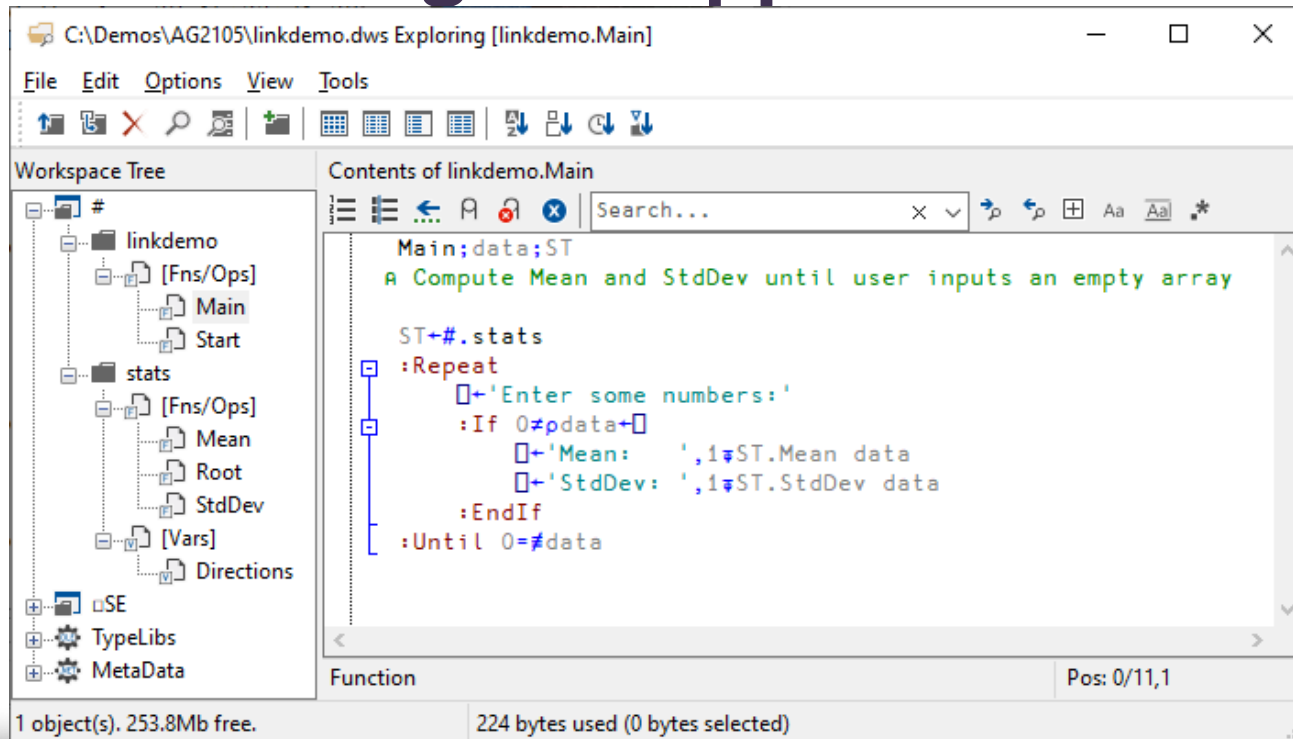


Using Text Files to Manage APL Processes

- 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 (.apl f)
 - Namespaces (.apl n)
 - Classes (.apl c)
 - Configuration files (.dcfg)
- Version 18.1 adds
 - Shebang (#!) scripts



Introducing the Application



Two Namespaces

- **linkdemo:**
main application
- **stats:**
statistics library

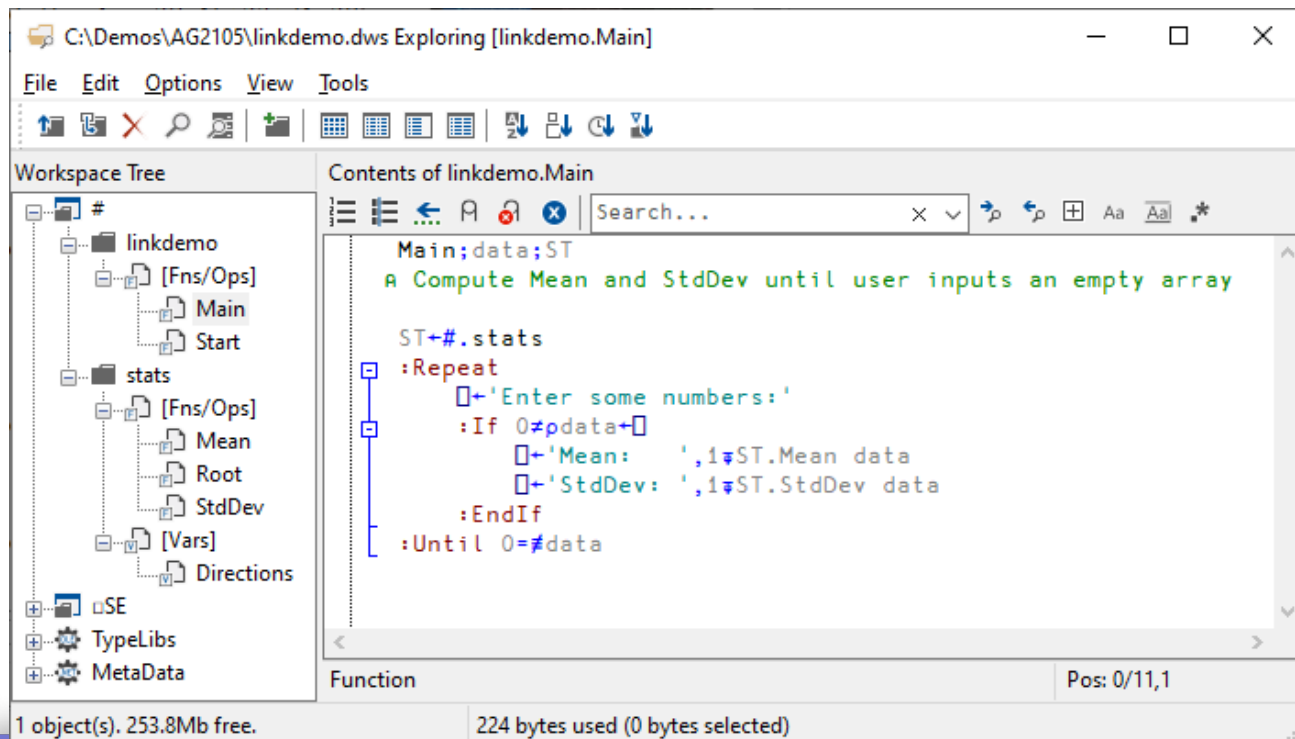


Demos / Cases

1. Introducing the application



Introducing ...



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
 - SE
 - 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

```

□lx
#.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:
□:
    9
  
```

Debugger

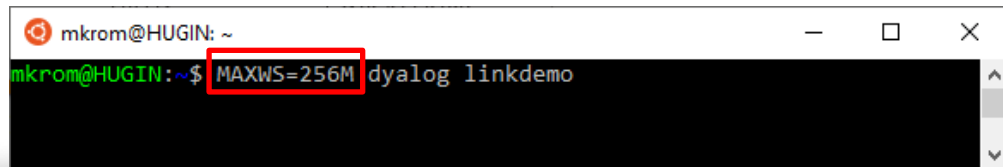
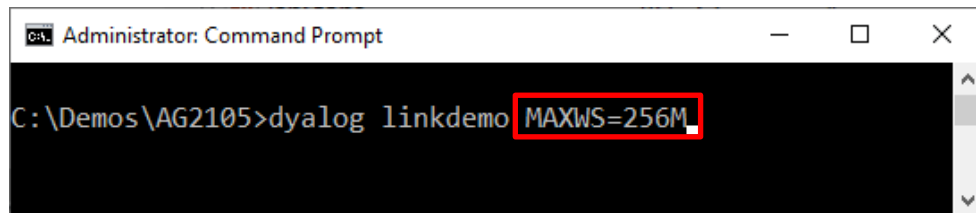
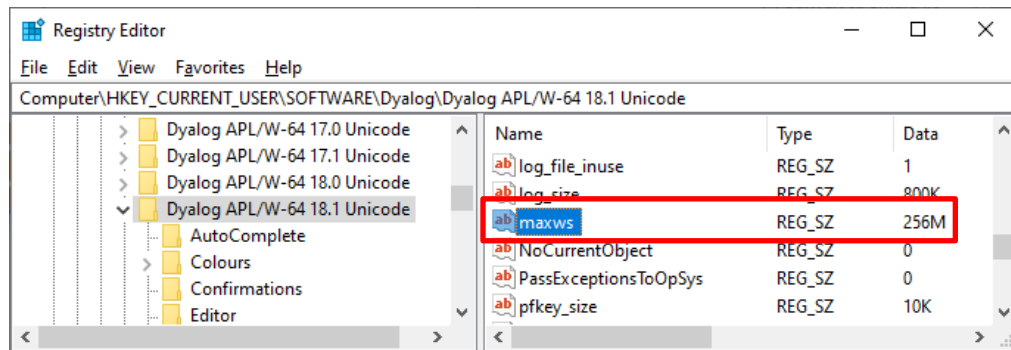
Ready... Ins NUM

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



Configuration Mechanisms

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

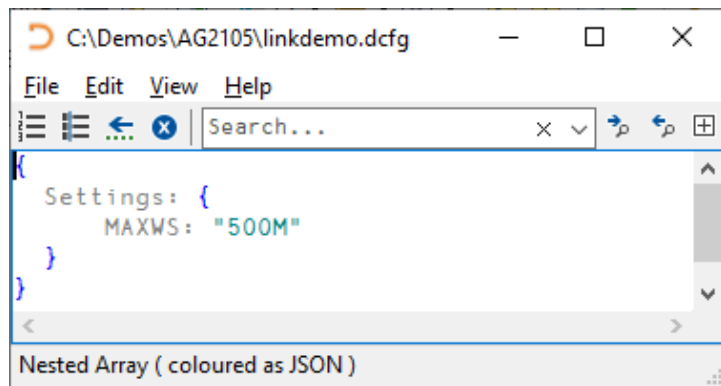


Demos / Cases

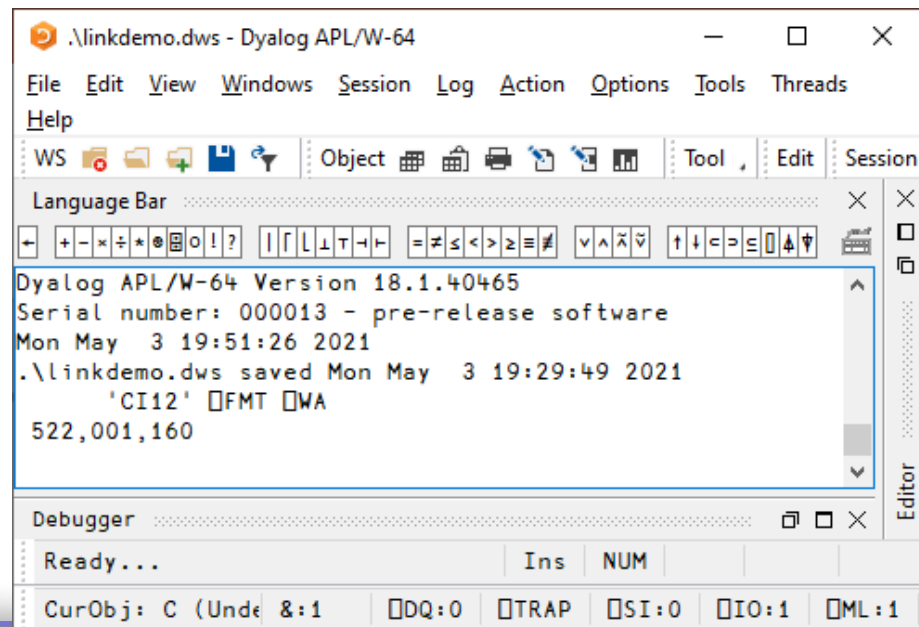
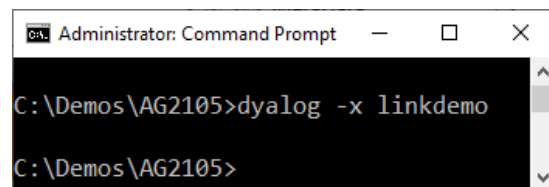
1. Introducing the application
2. Configuring the Interpreter with Text



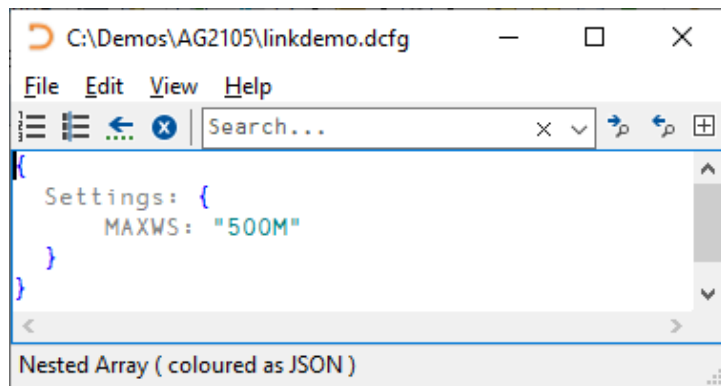
Configuration Files



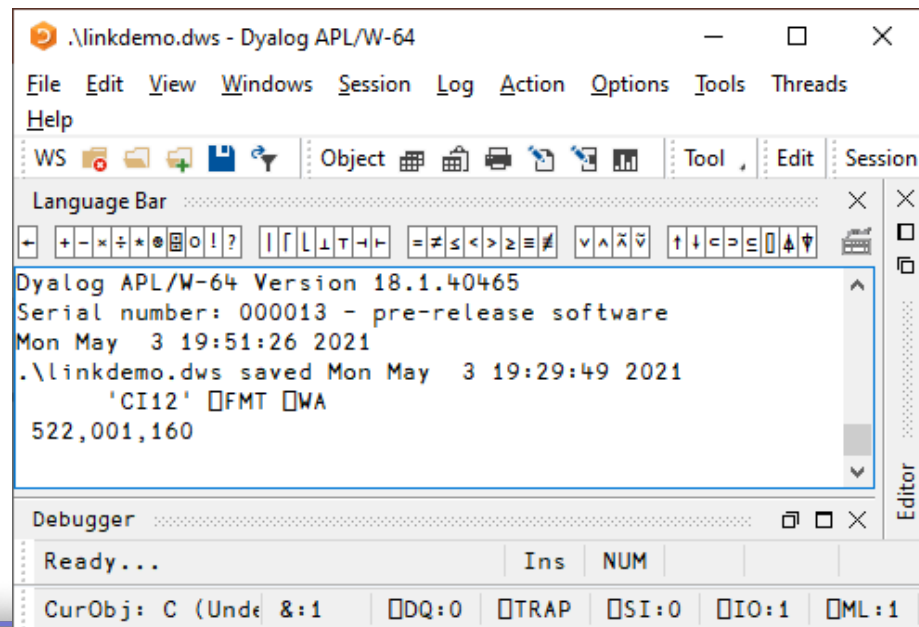
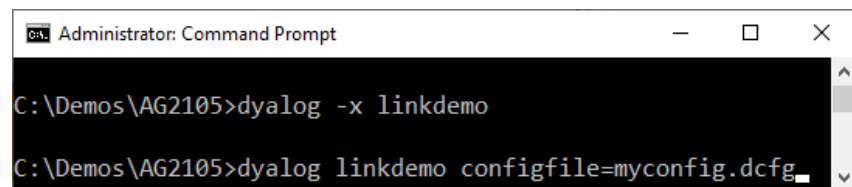
If a config file with the same name as the workspace exists, it is used →



Configuration Files



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



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) P...

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... Ins NUM

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



< > < > > This PC > Windows (C:) > Demos > AG2105

Search AG2105

Name	Date modified	Type	Size
app	03-05-2021 16:58	File folder	
dcfg	03-05-2021 14:17	File folder	
linkdemo - finished	03-05-2021 20:55	File folder	
AG2105.zip	03-05-2021 20:28	Compressed (zipp...	
cribsheet.docx	04-05-2021 11:15	Microsoft Word D...	
filestats.apl	03-05-2021 11:03	APL File	
helloworld.aplc	03-05-2021 15:00	APLC File	
helloworld.aplf	03-05-2021 14:43	APL Script ...	
helloworld.dcfg			
linkdemo.dcfg			
linkdemo.dws			
stats.apln			

Open

Edit

Run

Share with Skype

Share with Skype

Open with Code

Move to OneDrive

Edit with Notepad++

Send with Transfer...

Scan with Microsoft Defender...

Share

Open with >

TortoiseSVN >

Restore previous versions >

Send to >

helloworld dummy

[]+'Hello World! []WA=',,'CI12' []FMT []WA

Select Administrator: Command Prompt

C:\Demos\AG2105>dyalog load=helloworld.aplf

C:\Demos\AG2105>

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 [Icons] Object [Icons] Tool Edit Session

Language Bar [Icons]

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 [Icons]

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



File Edit View Help

Search...

C:\Demos\AG2105\stats.apln

[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÷1[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]       IO←'Enter some numbers:'
[5]       :If 0≠pdata←IO
[6]           IO←'Mean: ',1≠ST.Mean data
[7]           IO←'StdDev: ',1≠ST.StdDev data
[8]       :EndIf
[9]       :Until 0=ndata
[10]      IO←OFF
[11]   ▽

```

:EndNamespace

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

8:1

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
- May include system and user commands
- v18.1 multi-line input allows control structures and multi-line dfns



```

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

▽ r←Report txt;start;end
r←r⊂txt
| (start end)←3↓5↑r ' =r[1;], '
r←2>⊂VFI,start↓[2] end↑[2] r
r←'Avg size: ' 'Stddev:','CI12'
▽

@ --- Statistics Functions ---

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

Root←{α←2
      ω÷α}

StdDev←{2 Root (+,×~÷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

"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

```

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

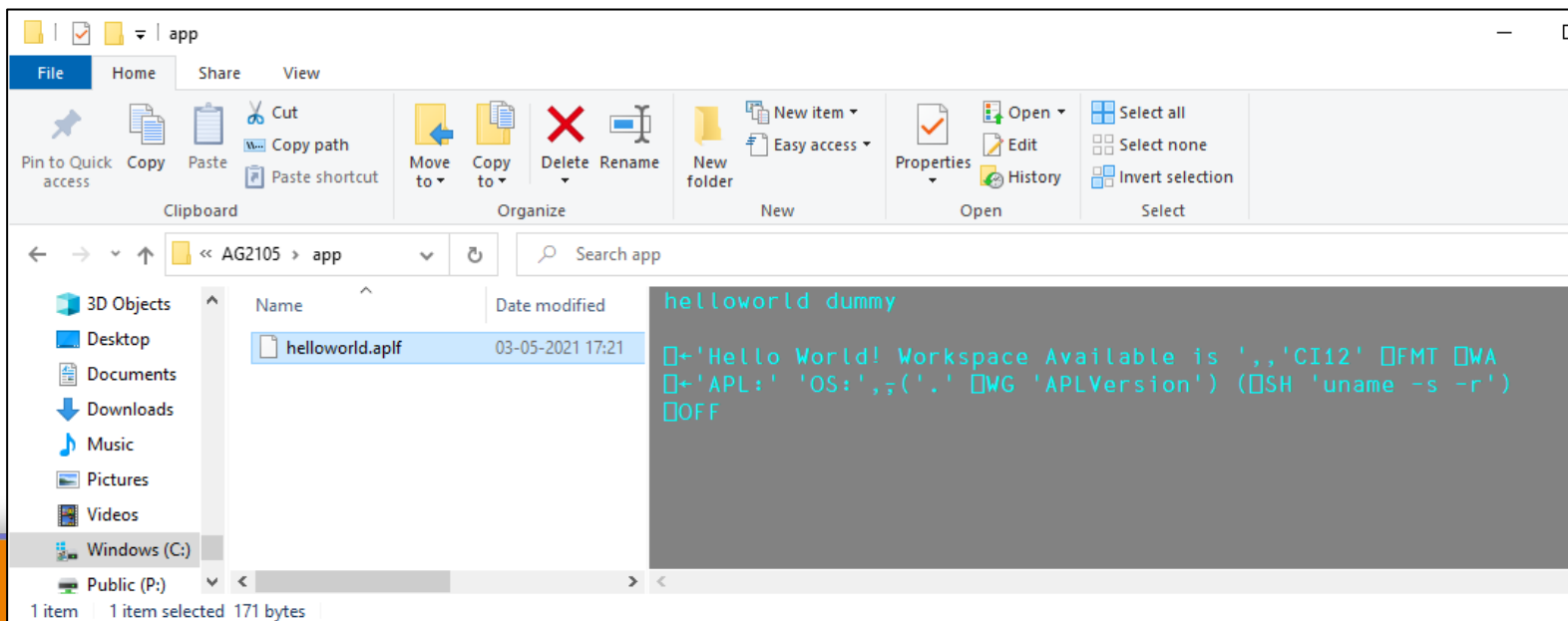
1. Introducing the application
2. Configuring the Interpreter with Text
3. Run one Function (and show config files also apply)
4. Run one Class
5. Run one Namespace
6. Launch a Script (and modify it?)
7. Launch a Docker Container



```
docker run -v c:\Demos\AG2105\app:/app dyalog/dyalog:18.1
```

Start Docker Container using Text

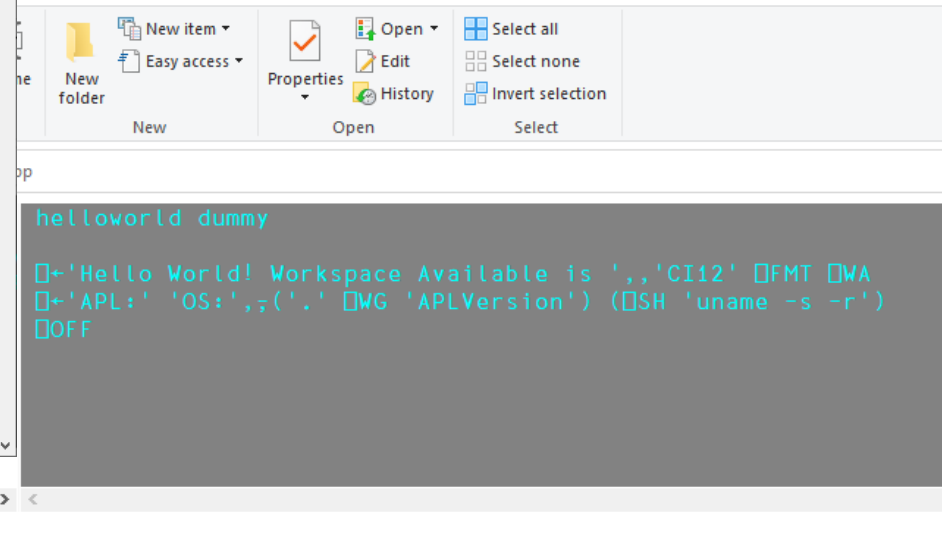
`-v C:\Demos\AG2105\app:/app`
Maps our demo as `/app` in the container





```
-v C:\Demos\AG2105\app:/app
```

Maps our demo as **/app** in the container

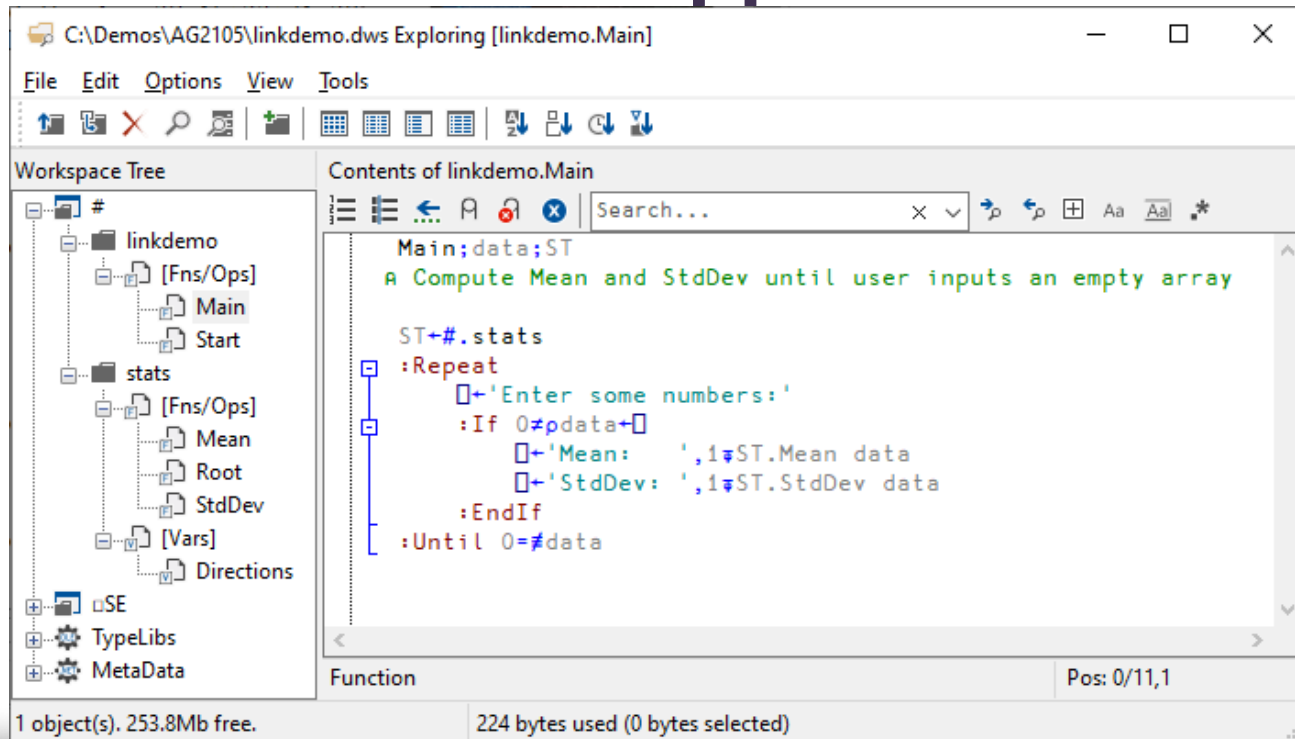


Demos / Cases

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



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 [Icons] Object [Icons] Tool Edit Session
Language Bar [Icons]
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

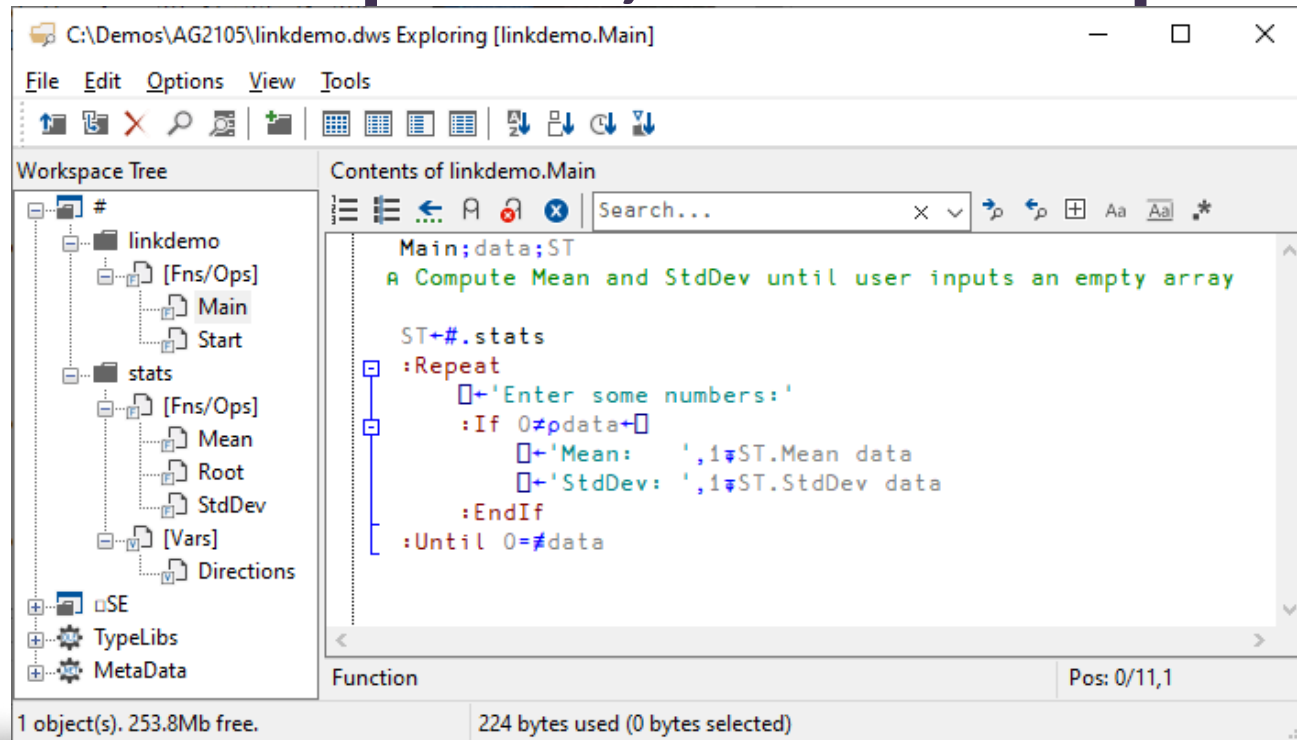
    ]link.create stats c:\demos\ag2105\stats -arrays
Linked: #.stats ↔ c:\demos\ag2105\stats

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

Debugger
Ready... Ins NUM
CurObj: stats ( &:1 [Icons] [Icons] [Icons] [Icons] [Icons]
```



One File per FN, One Folder per NS



The screenshot shows the Dyalog APL IDE interface. The title bar indicates the workspace is 'C:\Demos\AG2105\linkdemo.dws Exploring [linkdemo.Main]'. The menu bar includes File, Edit, Options, View, and Tools. The toolbar contains icons for file operations and editing. The Workspace Tree on the left shows a hierarchical structure: a root folder containing 'linkdemo' and 'stats' folders, and 'SE', 'TypeLibs', and 'MetaData' objects. The 'linkdemo' folder contains '[Fns/Ops]', 'Main', and 'Start' objects. The 'stats' folder contains '[Fns/Ops]', 'Mean', 'Root', 'StdDev', '[Vars]', and 'Directions' objects. The main editor window, titled 'Contents of linkdemo.Main', displays the following APL code:

```
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=ndata
```

The status bar at the bottom shows '1 object(s). 253.8Mb free.' and '224 bytes used (0 bytes selected)'. The bottom right corner of the editor shows 'Function' and 'Pos: 0/11,1'.



One File per FN, One Folder per NS

The screenshot displays the Dyalog APL IDE interface, illustrating the 'One File per FN, One Folder per NS' principle. The main window shows the 'linkdemo' namespace, which contains two files: 'Main.aplf' and 'Start.aplf'. The 'stats' namespace is also visible, containing four files: 'Directions.apla', 'Mean.aplf', 'Root.aplf', and 'StdDev.aplf'. The 'Main.aplf' file is selected, showing its contents in the right pane. The 'stats' namespace is also open, showing its contents in the right pane.

linkdemo Namespace:

Name	Date modified	Type	Size
Main.aplf	29-04-2021 15:33	Dyalog APL Script ...	1 KB
Start.aplf	29-04-2021 15:33	Dyalog APL Script ...	1 KB

stats Namespace:

Name	Date modified	Type	Size
Directions.apla	29-04-2021 15:38	Dyalog APL Script ...	1 KB
Mean.aplf	29-04-2021 15:36	Dyalog APL Script ...	1 KB
Root.aplf	29-04-2021 15:36	Dyalog APL Script ...	1 KB
StdDev.aplf	29-04-2021 15:36	Dyalog APL Script ...	1 KB

Main.aplf Content:

```
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
```

Mean.aplf Content:

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



Booting from Text

- A workspace is not required to launch...



Booting from Text

- ✧ A workspace is not required to launch...



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



File Edit Selection View Go Run Terminal Help Diff.aplf (Working Tree) - link - Visual Studio Code [Administrator]

SOURCE CONTROL

Message (Ctrl+Enter to c...

Changes 6

- Diff.aplf S... M
- Resync.aplf StartupS... M
- Status.aplf StartupSe... M
- Utils.aplf StartupSes... M
- Watcher.aplf Startu... M
- WSLoaded.aplf Start... M

COMMITTS

REPOSITORIES

FILE HISTORY

BRANCHES (3)

- master 01 221 ... ✓, ^
- gh-pages ⇄ origin/g...
- v3docs ⇄ origin/v3d...

REMOTES

TAGS

Diff.aplf (Working Tree) M X

StartupSession > Link > Diff.aplf

```

1 diff+{opts}Diff ns;container;link;links;nsref;
2 []IO []ML+1 1
3 :If U.debug=2
4   (1+>[]LC)[]STOP=[]SI
5 :EndIf
6 :Trap DEBUG+0
7   :Hold '[]SE.Link.Links'
8 - :If 0eplinks+U.GetLinks < U.Error 'Not Linked: ',ns < :End
9   opts+U.DefaultOpts+[]NS+0*(900I0)+- 'opts' A monadic?
10  (container ns)+([]RSI []XSI) U.ContainerNs ns
11  :if ~(<opts.arrays)e0 1 < opts.arrays+container U.NormName"o
12 - :If ~0eplnsref+(0 U.GetRefTo)ns
13   :AndIf ~0eplink+links U.LookupRef nsref
14   0 Watcher.Pause link A FSW cannot kick in because of th
15   link+[]NS link < link.arrays+opts
16   diff+U.Diff link
17   1 Watcher.Pause link A TODO : WriteFiles/FixFiles unnec
18 :Else
19   U.Error 'Not linked: ',ns
20 :EndIf
21 :EndHold
22 :Else
23   U.Resignal 1
24 :EndTrap
25
1 diff+{opts}Diff ns;container;link;links;nsref;[]IO;[]ML
2 []IO []ML+1 1
3 :If U.debug=2
4   (1+>[]LC)[]STOP=[]SI
5 :EndIf
6 :Trap DEBUG+0
7   :Hold '[]SE.Link.Links'
8 + :If ~nselinks+U.GetLinks < U.Error 'Not Linked: ',ns < :End
9   opts+U.DefaultOpts+[]NS+0*(900I0)+- 'opts' A monadic?
10  (container ns)+([]RSI []XSI) U.ContainerNs ns
11  :if ~(<opts.arrays)e0 1 < opts.arrays+container U.NormName"o
12 + :If ~0eplnsref+(0 U.GetRefTo)container
13   :AndIf ~0eplink+links U.LookupRef nsref
14   0 Watcher.Pause link A FSW cannot kick in because of th
15   link+[]NS link < link.arrays+opts.arrays
16   diff+U.Diff link
17   1 Watcher.Pause link A TODO : WriteFiles/FixFiles unnec
18 :Else
19   U.Error 'Not linked: ',ns
20 :EndIf
21 :EndHold
22 :Else
23   U.Resignal 1
24 :EndTrap
25

```

You, seconds ago Ln 8, Col 1 Spaces: 4 UTF-8 CRLF APL



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)

