Requirements

Requirements

- You need:
  - Dyalog Version 17.0
  - tp1.dws
  - A web browser

Requirements

- You need:
  - Dyalog Version 17.0 (obviously)
  - tp1.dws
  - A web browser

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- You need:
    - Dyalog Version 17.0 (obviously)
    - tp1.dws   (next slide)
    - A web browser

Requirements

- You need:
  - Dyalog Version 17.0 (obviously)
  - tp1.dws   (next slide)
  - A web browser

- We will:
  - Access http://dyalog.com and http://unicode.org/
  - Access and create files on your PC

Let's set up!

DYALOG

Let's set up!

- Get tp1.dws from   tinyurl.com/dyalog18

Let's set up!

- Get tp1.dws from   tinyurl.com/dyalog18

  dyalog.com/uploads/conference/dyalog18/workshop_prerequisites

Let's set up!

- Get tp1.dws from   tinyurl.com/dyalog18

  dyalog.com/uploads/conference/dyalog18/workshop_prerequisites

- Load the workspace

Let's set up!

- Get tp1.dws from   tinyurl.com/dyalog18

  dyalog.com/uploads/conference/dyalog18/workshop_prerequisites

- Load the workspace

- Files should have been created

⎕CSV

⎕CSV

Demo

Version 17.0 in Depth

Exercise 1

Exercise 1

```
(⎕CSV ⍠( ? )( ? )) dir,'81.txt'
```

Exercise 1

```
(⎕CSV ⍠( ❓ )( ❓ )) dir,'81.txt'
```

```
John Lennon                   "Imagine"                              10 January 1981      4
John Lennon                   "Woman"                                7 February 1981      2
Joe Dolce Music Theatre       "Shaddap You Face"                     21 February 1981     3
Roxy Music                    "Jealous Guy"                          14 March 1981        2
Shakin' Stevens               "This Ole House"                       28 March 1981        3
Bucks Fizz                    "Making Your Mind Up"                  18 April 1981        3
Adam and the Ants             "Stand and Deliver"                    9 May 1981           5
Smokey Robinson               "Being with You"                       13 June 1981         2
Michael Jackson               "One Day In Your Life"                 27 June 1981         2
The Specials                  "Ghost Town"                           11 July 1981         3
Shakin' Stevens               "Green Door"                           1 August 1981        4
Aneka                         "Japanese Boy"                         29 August 1981       1
Soft Cell                     "Tainted Love"                         5 September 1981     2
Adam and the Ants             "Prince Charming"                      19 September 1981    4
Dave Stewart and Barbara Gaskin "It's My Party"                      17 October 1981      4
The Police                    "Every Little Thing She Does Is Magic" 14 November 1981     1
Queen and David Bowie         "Under Pressure"                       21 November 1981     2
Julio Iglesias                "Begin The Beguine (Volver A Empezar)" 5 December 1981      1
The Human League              "Don't You Want Me"                    12 December 1981     5
```

Exercise 1

```
(⎕CSV ⍠( ? )( ? )) dir,'81.txt'
```

```
John Lennon                      "Imagine"                                        10 January 1981       4
John Lennon                      "Woman"                                          7 February 1981       2
Joe Dolce Music Theatre          "Shaddap You Face"                               21 February 1981      3
Roxy Music                       "Jealous Guy"                                    14 March 1981         2
Shakin' Stevens                  "This Ole House"                                 28 March 1981         3
Bucks Fizz                       "Making Your Mind Up"                            18 April 1981         3
Adam and the Ants                "Stand and Deliver"                              9 May 1981            5
Smokey Robinson                  "Being with You"                                 13 June 1981          2
Michael Jackson                  "One Day In Your Life"                           27 June 1981          2
The Specials                     "Ghost Town"                                     11 July 1981          3
Shakin' Stevens                  "Green Door"                                     1 August 1981         4
Aneka                            "Japanese Boy"                                   29 August 1981        1
Soft Cell                        "Tainted Love"                                   5 September 1981      2
Adam and the Ants                "Prince Charming"                                19 September 1981     4
Dave Stewart and Barbara Gaskin  "It's My Party"                                  17 October 1981       4
The Police                       "Every Little Thing She Does Is Magic"           14 November 1981      1
Queen and David Bowie            "Under Pressure"                                 21 November 1981      2
Julio Iglesias                   "Begin The Beguine (Volver A Empezar)"           5 December 1981       1
The Human League                 "Don't You Want Me"                              12 December 1981      5
```

Exercise 1

⎕('Foo' 1)('Bar' 2)

```
(⎕CSV ⎕( ? )( ? )) dir,'81.txt'
```

```
John Lennon                     "Imagine"                                10 January 1981      4
John Lennon                     "Woman"                                  7 February 1981      2
Joe Dolce Music Theatre         "Shaddap You Face"                       21 February 1981     3
Roxy Music                      "Jealous Guy"                            14 March 1981        2
Shakin' Stevens                 "This Ole House"                         28 March 1981        3
Bucks Fizz                      "Making Your Mind Up"                    18 April 1981        3
Adam and the Ants               "Stand and Deliver"                      9 May 1981           5
Smokey Robinson                 "Being with You"                         13 June 1981         2
Michael Jackson                 "One Day In Your Life"                   27 June 1981         2
The Specials                    "Ghost Town"                             11 July 1981         3
Shakin' Stevens                 "Green Door"                             1 August 1981        4
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Adam and the Ants               "Prince Charming"                        19 September 1981    4
Dave Stewart and Barbara Gaskin "It's My Party"                          17 October 1981      4
The Police                      "Every Little Thing She Does Is Magic"   14 November 1981     1
Queen and David Bowie           "Under Pressure"                         21 November 1981     2
Julio Iglesias                  "Begin The Beguine (Volver A Empezar)"   5 December 1981      1
The Human League                "Don't You Want Me"                      12 December 1981     5
```

Exercise 1

⎕('Foo' 1)('Bar' 2)

(⎕CSV ⎕(?)(?)) dir,'81.txt'

⎕ or ⎕OPT

```
John Lennon                    "Imagine"                              10 January 1981      4
John Lennon                    "Woman"                                7 February 1981      2
Joe Dolce Music Theatre        "Shaddap You Face"                     21 February 1981     3
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Michael Jackson                "One Day In Your Life"                 27 June 1981         2
The Specials                   "Ghost Town"                           11 July 1981         3
Shakin' Stevens                "Green Door"                           1 August 1981        4
Aneka                          "Japanese Boy"                         29 August 1981       1
Soft Cell                      "Tainted Love"                         5 September 1981     2
Adam and the Ants              "Prince Charming"                      19 September 1981    4
Dave Stewart and Barbara Gaskin "It's My Party"                       17 October 1981      4
The Police                     "Every Little Thing She Does Is Magic" 14 November 1981     1
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The Human League               "Don't You Want Me"                    12 December 1981     5
```

Exercise 1

⎕('Foo' 1)('Bar' 2)

(⎕CSV ⎕(?)(?)) dir,'81.txt'

⎕ or ⎕OPT

John Lennon	"Imagine"	10 January 1981	4
John Lennon	"Woman"	7 February 1981	2
Joe Dolce Music Theatre	"Shaddap You Face"	21 February 1981	3
Roxy Music	"Jealous Guy"	14 March 1981	2
Shakin' Stevens	"This Ole House"	28 March 1981	3
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Adam and the Ants	"Stand and Deliver"	9 May 1981	5
Smokey Robinson	"Being with You"	13 June 1981	2
Michael Jackson	"One Day In Your Life"	27 June 1981	2
The Specials	"Ghost Town"	11 July 1981	3
Shakin' Stevens	"Green Door"	1 August 1981	4
Aneka	"Japanese Boy"	29 August 1981	1
Soft Cell	"Tainted Love"	5 September 1981	2
Adam and the Ants	"Prince Charming"	19 September 1981	4
Dave Stewart and Barbara Gaskin	"It's My Party"	17 October 1981	4
The Police	"Every Little Thing She Does Is Magic"	14 November 1981	1
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Julio Iglesias	"Begin The Beguine (Volver A Empezar)"	5 December 1981	1
The Human League	"Don't You Want Me"	12 December 1981	5

view dir,'81.txt'

]help ⎕CSV

Exercise 1

Exercise 1

Solution

⎕NCOPY and ⎕NMOVE

⎕NCOPY and ⎕NMOVE

- Copies or moves one or more files and/or directories

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- Move within a filesystem is a fast rename

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- Move across filesystems is a copy-and-delete

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- Options to replace / update existing

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- Copies or moves one or more files and/or directories
- Move within a filesystem is a fast rename
- Move across filesystems is a copy-and-delete
- Options to replace / update existing
- Options to preserve attributes

⎕NCOPY and ⎕NMOVE

⎕NCOPY and ⎕NMOVE

```
'destination' ⎕NCOPY 'source'
```

⎕NCOPY and ⎕NMOVE

```
'destination' ⎕NCOPY 'source'

destination ← source
```

⎕NCOPY and ⎕NMOVE

```
'destination' ⎕NCOPY 'source'

destination ← source
'destination' ⎕FCOPY source_tieno
```

⎕NCOPY and ⎕NMOVE

⎕NCOPY and ⎕NMOVE

```
'path2/name2' ⎕NCOPY 'path1/name1'
```

⎕NCOPY and ⎕NMOVE

```
'path2/name2' ⎕NCOPY 'path1/name1'
```

If `path2/name2` is a *directory*, copy <u>is placed inside it</u> to create `path2/name2/name1`

⎕NCOPY and ⎕NMOVE

```
'path2/name2' ⎕NCOPY 'path1/name1'
```

If `path2/name2` is a *directory*, copy <u>is placed inside it</u> to create `path2/name2/name1`

If `path2/name2` is a *file* or *does not exist*, copy <u>is named</u> `path2/name2`

⎕NCOPY and ⎕NMOVE

⎕NCOPY and ⎕NMOVE

Demo

Exercise 2

Exercise 2

```
)ed ex2
```

Exercise 2

```
)ed ex2
```

Amend this code so that the file appears fully-formed.

Exercise 2

```
)ed ex2
```

Amend this code so that the file appears fully-formed.

➢ Temp dir: 739⍳0

➢ Create unique name: (⎕NCREATE⍠'Unique' 1)

➢ Name of tied file t: ⊃⎕NINFO t

Exercise 2 solution

Exercise 2 solution

```
tgt←'a.dat'

t←tgt ⎕NCREATE 0

(⍳100)⎕NAPPEND t 83
⎕NUNTIE t
```

Exercise 2 solution

```
tgt←'a.dat'
tmp←739⍳0
t←tgt ⎕NCREATE 0

(⍳100)⎕NAPPEND t 83
⎕NUNTIE t
```

Exercise 2 solution

```
tgt←'a.dat'
tmp←739⍳0



(⍳100)⎕NAPPEND t 83
⎕NUNTIE t
```

Exercise 2 solution

```
tgt←'a.dat'
tmp←739⍳0
t←(tmp,'/XXX')(⎕NCREATE⍠'Unique' 1)0

(⍳100)⎕NAPPEND t 83
⎕NUNTIE t
```

Exercise 2 solution

```
tgt←'a.dat'
tmp←739⍳0
t←(tmp,'/XXX')(⎕NCREATE⍠'Unique' 1)0
name←⊃⎕NINFO t
(⍳100)⎕NAPPEND t 83
⎕NUNTIE t
```

Exercise 2 solution

```
tgt←'a.dat'
tmp←739⍳0
t←(tmp,'/XXX')(⎕NCREATE⍠'Unique' 1)0
name←⊃⎕NINFO t
(⍳100)⎕NAPPEND t 83
⎕NUNTIE t
tgt ⎕NMOVE name
```

Recursive ⎕NDELETE and ⎕NINFO

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- `⎕NDELETE dir`
  deletes an empty directory

Recursive ⎕NDELETE and ⎕NINFO

- ⎕NDELETE dir
  deletes an empty directory

- 2 ⎕NDELETE dir
  deletes a directory and everything in it

New!

Recursive ⎕NDELETE and ⎕NINFO

- ⎕NDELETE dir
  deletes an empty directory

- 2 ⎕NDELETE dir
  deletes a directory and everything in it

- (Seen earlier in workshop!)
  ⊢ 2 ⎕NDELETE dir,'Dyalog'

New!

Recursive ⎕NDELETE and ⎕NINFO

Recursive ⎕NDELETE and ⎕NINFO

Old!

- `{X} ⎕NINFO 'dir/name'`

  Information about 'dir/name'

Recursive ⎕NDELETE and ⎕NINFO

- `{X}  ⎕NINFO 'dir/name'`

  Information about 'dir/name'

- `{X}  (⎕NINFO⍠'Wildcard' 1) 'dir/name*'`

  Information about everything which matches 'name*'
  'in dir'

Recursive ⎕NDELETE and ⎕NINFO

Recursive ⎕NDELETE and ⎕NINFO

- `{X} (⎕NINFO⍠'Recurse' 1) 'dir/name'`

  Information about 'name' in 'dir' *and* its sub-directories

Recursive ⎕NDELETE and ⎕NINFO

New!

- `{X} (⎕NINFO⍠'Recurse' 1) 'dir/name'`

  Information about 'name' in 'dir' *and* its sub-directories

- `{X} (⎕NINFO⍠('Wildcard' 1)('Recurse' 1)) 'dir/name*'`

  Information about everything which matches 'name*' in 'dir' and its subdirectories

Exercise 3

Exercise 3

- How many workspaces (`*.dws` files) are there in the Dyalog 17.0 installation directory?

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- `⎕SE.SALTUtils.DYALOG`

Exercise 3

- How many workspaces (`*.dws` files) are there in the Dyalog 17.0 installation directory?

- `⎕SE.SALTUtils.DYALOG`

- `{X} (⎕NINFO⍠('Wildcard' 1)('Recurse' 1)) 'dir/name*'`

  Information about everything which matches 'name*' in 'dir' and its subdirectories

Exercise 3

Exercise 3

Solution

Text files

Text files

- `'ASCII' ⎕NGET 'a.txt'`

Old!

Text files

- `'ASCII' ⎕NGET 'a.txt'`
- `'Windows-1252' ⎕NGET 'b.txt'`

Old!

Text files

- `'ASCII' ⎕NGET 'a.txt'`
- `'Windows-1252' ⎕NGET 'b.txt'`
- `'UTF-8' ⎕NGET 'c.txt'`

Old!

Text files

- `'ASCII' ⎕NGET 'a.txt'`
- `'Windows-1252' ⎕NGET 'b.txt'`
- `'UTF-8' ⎕NGET 'c.txt'`
- `'UTF-16' ⎕NGET 'd.txt'`

Old!

Version 17.0 in Depth

Text files

- `'ASCII' ⎕NGET 'a.txt'`
- `'Windows-1252' ⎕NGET 'b.txt'`
- `'UTF-8' ⎕NGET 'c.txt'`
- `'UTF-16' ⎕NGET 'd.txt'`
- …

Old!

Text files

- `'ASCII' ⎕NGET 'a.txt'`
- `'Windows-1252' ⎕NGET 'b.txt'`
- `'UTF-8' ⎕NGET 'c.txt'`
- `'UTF-16' ⎕NGET 'd.txt'`
- `…`
- `⎕NGET 'a.txt'`

Old!

Text files

- `'ASCII' ⎕NGET 'a.txt'`
- `'Windows-1252' ⎕NGET 'b.txt'`
- `'UTF-8' ⎕NGET 'c.txt'`
- `'UTF-16' ⎕NGET 'd.txt'`
- `…`
- `⎕NGET 'a.txt'`

- `data 'UTF-8' ⎕NPUT 'x.txt'`

Old!

Text files

- `'ASCII' ⎕NGET 'a.txt'`
- `'Windows-1252' ⎕NGET 'b.txt'`
- `'UTF-8' ⎕NGET 'c.txt'`
- `'UTF-16' ⎕NGET 'd.txt'`
- `…`
- `⎕NGET 'a.txt'`

- `data 'UTF-8' ⎕NPUT 'x.txt'`

Old!

Text files – extended ASCII etc.

Text files – extended ASCII etc.

- `'Windows-1252' ⎕NGET 'b.txt'`

Text files – extended ASCII etc.

- `'Windows-1252' ⎕NGET 'b.txt'` ✔

Text files – extended ASCII etc.

- `'Windows-1252' ⎕NGET 'b.txt'` ✓

- `'Windows-1251' ⎕NGET 'b.txt'`
- `'MacRoman' ⎕NGET 'b.txt'` ✗
- `'EBCDIC-037' ⎕NGET 'b.txt'`
- `'PETSCI' ⎕NGET 'b.txt'`
- …

Version 17.0 in Depth

"ANSI" Western Europe - Windows-1252

	-0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-A	-B	-C	-D	-E	-F
0-	Null	SOH	STX	ETX	EOT	ENQ	ACK	BEL	BS	HT	LF	VT	FF	CR	SO	SI
1-	DLE	DC1	DC2	DC3	DC4	NAK	SYN	ETB	CAN	EM	SUB	ESC	FS	GS	RS	US
2-	spc	!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
3-	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4-	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5-	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6-	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7-	p	q	R	s	t	u	v	w	x	y	z	{	|	}	~	DEL
8-	€		,	ƒ	„	…	†	‡	^	‰	Š	‹	Œ		Ž	
9-		'	'	"	"	•	–	—	~	™	š	›	œ		ž	Ÿ
A-	nbsp	¡	¢	£	¤	¥	¦	§	¨	©	ª	«	¬	shy	®	¯
B-	°	±	²	³	´	µ	¶	·	,	¹	º	»	¼	½	¾	¿
C-	À	Á	Â	Ã	Ä	Å	Æ	Ç	È	É	Ê	Ë	Ì	Í	Î	Ï
D-	Ð	Ñ	Ò	Ó	Ô	Õ	Ö	×	Ø	Ù	Ú	Û	Ü	Ý	Þ	ß
E-	à	á	â	ã	ä	å	æ	ç	è	é	ê	ë	ì	í	î	ï
F-	ð	ñ	ò	ó	ô	õ	ö	÷	ø	ù	ú	û	ü	ý	þ	ÿ

"ANSI" Russia - Windows-1251

	-0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-A	-B	-C	-D	-E	-F
0-	Null	SOH	STX	ETX	EOT	ENQ	ACK	BEL	BS	HT	LF	VT	FF	CR	SO	SI
1-	DLE	DC1	DC2	DC3	DC4	NAK	SYN	ETB	CAN	EM	SUB	ESC	FS	GS	RS	US
2-	spc	!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
3-	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
4-	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
5-	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
6-	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
7-	p	q	r	s	t	u	v	w	x	y	z	{			}	~	DEL
8-	Ђ	ѓ	‚	ѓ	„	…	†	‡	€	‰	Љ	‹	Њ	Ќ	Ћ	Џ
9-	ђ	'	'	"	"	•	–	—		™	љ	›	њ	ќ	ћ	џ
A-	nbsp	Ў	ў	Ј	¤	Ґ	¦	§	Ё	©	Є	«	¬	shy	®	Ї
B-	°	±	І	і	ґ	µ	¶	·	ё	№	є	»	ј	S	s	ї
C-	А	Б	В	Г	Д	Е	Ж	З	И	Й	К	Л	М	Н	О	П
D-	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Э	Ю	Я
E-	а	б	в	г	д	е	ж	з	и	й	к	л	м	н	о	п
F-	р	с	т	у	ф	х	ц	ч	ш	щ	ъ	ы	ь	э	ю	я

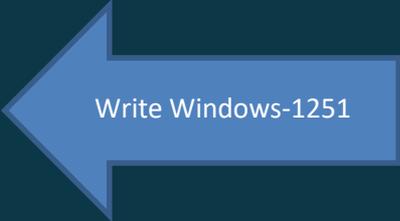# Introduction to the Russian Constitution

КОНСТИТУЦИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ

Принята всенародным голосованием
12 декабря 1993 года

Мы, многонациональный народ Российской Федерации, соединенные общей судьбой на своей земле, утверждая права и свободы человека, гражданский мир и согласие, соединяя исторически сложившееся государственное единство, исходя из общепризнанных принципов равноправия и самоопределения народов, чтя память предков, передавших нам любовь и уважение к Отечеству, веру в добро и справедливость, возрождая суверенную государственность России и утверждая незыблемость ее демократической основы, стремясь обеспечить благополучие и процветание России, исходя из ответственности за свою Родину перед нынешним и будущими поколениями, сознавая себя частью мирового сообщества, принимаем КОНСТИТУЦИЮ РОССИЙСКОЙ ФЕДЕРАЦИИ.

Write Windows-1251

Introduction to the Russian Constitution

ÊÎÍÑÒÈÒÓÖÈß ÐÎÑÑÈÉÑÊÎÉ ÔÅÄÅÐÀÖÈÈ

Ïðèíÿòà âñåíàðîäíûì ãîëîñîâàíèåì
12 äåêàáðÿ 1993 ãîäà

Ìû, ìíîãîíàöèîíàëüíûé íàðîä Ðîññèéñêîé Ôåäåðàöèè, ñîåäèíåííûå îáùåé ñóäüáîé íà
ñâîåé çåìëå, óòâåðæäàÿ ïðàâà è ñâîáîäû ÷åëîâåêà, ãðàæäàíñêèé ìèð è ñîãëàñèå, ñîõðàíÿÿ
èñòîðè÷åñêè ñëîæèâøååñÿ ãîñóäàðñòâåííîå åäèíñòâî, èñõîäÿ èç îáùåïðèçíàííûõ ïðèíöèïîâ
ðàâíîïðàâèÿ è ñàìîîïðåäåëåíèÿ íàðîäîâ, ÷òÿ ïàìÿòü ïðåäêîâ, ïåðåäàâøèõ íàì ëþáîâü è
óâàæåíèå ê Îòå÷åñòâó, âåðó â äîáðî è ñïðàâåäëèâîñòü, âîçðîæäàÿ ñóâåðåííóþ
ãîñóäàðñòâåííîñòü Ðîññèè è óòâåðæäàÿ íåçûáëåìîñòü åå äåìîêðàòè÷åñêîé îñíîâû, ñòðåìÿñü
îáåñïå÷èòü áëàãîïîëó÷èå è ïðîöâåòàíèå Ðîññèè, èñõîäÿ èç îòâåòñòâåííîñòè çà ñâîþ Ðîäèíó
ïåðåä íûíåøíèì è áóäóùèìè ïîêîëåíèÿìè, ñîçíàâàÿ ñåáÿ ÷àñòüþ ìèðîâîãî ñîîáùåñòâà,
ïðèíèìàåì ÊÎÍÑÒÈÒÓÖÈÞ ÐÎÑÑÈÉÑÊÎÉ ÔÅÄÅÐÀÖÈÈ.

Read Windows-1252

Text files

Version 17.0 in Depth

Text files

Demo

Exercise 4

Exercise 4

- Read meaningful text from
  `dir,'360.txt'`

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- tinyurl.com/dyalog18b
  www.unicode.org/Public/MAPPINGS/VENDORS/MICSFT/

Exercise 4

- Read meaningful text from
  `dir,'360.txt'`

EBCDIC-037

- tinyurl.com/dyalog18b
  www.unicode.org/Public/MAPPINGS/VENDORS/MICSFT/

Exercise 4

Exercise 4

Solution

Break

Resume at 15:45

Error reporting

- More informative
- More accurate

Locals lines

- Organise your locals
- Plays nicely with git

Locals lines

```
      ∇ r←myapp args;event;obj;operation;intercept;scode;stext;mime
               ;url;header;postdata;approot;page;requested;method
[1]    ⍝ Serve up a small application
[2]
[3]    approot←'http://myapp/'
[4]
[5]    :If 0=≢args⍝ Setup
[6]        #.MyApp←⎕NS''
[7]        #.MyApp.main←'Hello APLers<br/>Click <a href="clicked">here</a>!'
[8]        #.MyApp.clicked←'Thank You!<br/>Click <a href="main">to go back...</a>!'
[9]        event←'Event' 'HTTPRequest' 'myapp'
[10]       intercept←1 2⍴(approot,'*')1 ⍝ intercept all URLs beginning with our approot
[11]       'hr'⎕WC'HTMLrenderer'('Size' 150 300)('Coord' 'ScaledPixel')
                               ('InterceptedURLs'intercept)event
[12]       hr.URL←approot,'main' ⍝ Off we go!
[13]       :Return
[14]   :EndIf
[15]
```

Locals lines

```
      ∇ r←myapp args;event;obj;operation;intercept;scode;stext;mime
[1]                ;url;header;postdata;approot;page;requested;method
[2]    ⍝ Serve up a small application
[3]
[4]     approot←'http://myapp/'
[5]
[6]     :If 0=≠args⍝ Setup
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[8]         #.MyApp.main←'Hello APLers<br/>Click <a href="clicked">here</a>!'
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[11]        intercept←1 2ρ(approot,'*')1 ⍝ intercept all URLs beginning with our approot
[12]        'hr'⎕WC'HTMLrenderer'('Size' 150 300)('Coord' 'ScaledPixel')('InterceptedURLs'intercept)event
[13]        hr.URL←approot,'main' ⍝ Off we go!
[14]        :Return
[15]    :EndIf
[16]
```

Locals lines

```
    r←x foo y;a;b;c
 ⊟⍝ foo: update all the things
  ⍝ x: vector of things
  ⍝ y: matrix of bits
 └⍝ r: array of stuff

  ;⎕IO;⎕ML

  ⍝ spatial locals
 ⊟;up;down;left;right
 └;top;bottom;in;out ⍝ comment

  ⍝ temporal locals
  ;now;then;later

  ⍝ code starts here
  ⎕IO←0
  ⎕ML←1
  (up down left right)←getbounds y
```

HTML renderer

```
'h'⎕WC'HTMLRenderer'
```

HTML renderer:
static HTML

```
'h'⎕WC'HTMLRenderer'
   ('HTML' '<u>APL</u>')
```

HTML renderer:
web content

```
'h'⎕WC'HTMLRenderer'
    ('URL' 'www.dyalog.com')
```

HTML renderer: intercepts

```
U←1 2ρ'*.html' 1
'h'⎕WC'HTMLRenderer'
   ('InterceptedURLs' U)
   ('event' 'HTTPRequest' 'fn')
```

Open Online Help in Browser

```
]Help
```

Open Online Help in Browser

```
]Help
```

Open Online Help in Browser

```
]Help
```

- Symbols for primitive functions and operators
- Control structures and syntactic symbols
- System functions, operators, variables, and constants
- System and user commands
- GUI objects, properties, methods, and events
- Error messages and numbers
- else: search Dyalog help system

Open Online Help in Browser

```
]Help
```

- Symbols for primitive functions and operators
- Control structures and syntactic symbols
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- Error messages and numbers
- else: search Dyalog help system

Just web address with `-url`

Hands-on!

Hands-on!

```
⎕← table ← 'Bob' 'Abe' 'Bob' 'Abe',⍪10 10 3 10
```

```
Bob    10
Abe    10
Bob     3
Abe    10
```

Hands-on!

```
⎕← table ← 'Bob' 'Abe' 'Bob' 'Abe',⍪10 10 3 10
```
1.   distinct ← {remove all duplicate rows} table

```
Bob   10              Bob   10
Abe   10      →       Abe   10
Bob    3              Bob    3
Abe   10
```

   1.

Hands-on!

```
⎕← table ← 'Bob' 'Abe' 'Bob' 'Abe',⍤10 10 3 10
1.   distinct ← {remove all duplicate rows} table
2.   sorted ← {sort by number, then by name} distinct
```

```
Bob    10                Bob    10                Bob     3
Abe    10        →       Abe    10        →       Abe    10
Bob     3                Bob     3                Bob    10
Abe    10
```

1.   2.

Hands-on!

⎕← table ← 'Bob' 'Abe' 'Bob' 'Abe',⍪10 10 3 10
1. distinct ← {remove all duplicate rows} table
2. sorted ← {sort by number, then by name} distinct
3. position ← sorted {where ⍵ would fit in} new

```
Bob  10         Bob  10         Bob   3    ← 0
Abe  10    →    Abe  10    →    Abe  10    ← 1   ← Bob   5
Bob   3         Bob   3         Bob  10    ← 2
Abe  10                                    ← 3
```

1.   2.   3.

Other 17.0 Enhancements

Results for the remaining no-result system functions:

- ⎕ARBOUT
- Dyadic ⎕CMD/⎕SH
- ⎕CY
- ⎕LOCK
- ⎕SHADOW

Summary: Improvements in Dyalog 17.0

- Extended primitives: ⍳ ⍋ ⍒ have TAO and ∪ works for arrays of all ranks
- Better error messages, more precise ∧ and more info in ⎕DMX
- Locals lines after line `[0]`
- New user commands: `]Link` `]Help`
- New system functions: `⎕NCOPY` `⎕NMOVE`
- Can include sub-directories: `⎕NINFO` `⎕NDELETE`
- Additional file formats: `⎕CSV`
- Custom character set support: `⎕CSV` `⎕GET` `⎕NPUT` `⎕R` `⎕S`
- `HTMLRenderer` has `InterceptedURLs` property
- All system functions return a result

Even more improvements listed in the release notes for 17.0