

D17: Prefix Agreement: A Proposal for an Extension to the @ Operator

A Prefix agreement: a small extension to @

A Part 0: quick recap of the @ operator

```
T←ι3 ◊ (1 0 1/T)×←10 ◊ T
10 2 30
```

```
10 ×@{1 0 1} ι3
10 2 30
```

A Part I: selection agreement

```
⊖M←3 5ρι15           A numeric matrix
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
```

```
10 ×@{3 5ρ1 0} M     A alternate numbers × 10
10 2 30 4 50
6 70 8 90 10
110 12 130 14 150
```

```
10 ×@{1 0 1} M       A alternate ROWS × 10 ???
RANK ERROR: Right operand and argument ranks differ
10×@{1 0 1}M         A alternate ROWS × 10 ???
^
```

```
)copy dfns at
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```

```
M
1 2 3 4 5
6 7 8 9 10
11 12 13 14 15
```

```
10 ×at{1 0 1} M     A alternate ROWS × 10
10 20 30 40 50
6 7 8 9 10
110 120 130 140 150
```

```
10 ×at{v/0=7|ω} M   A rows with multiple of 7
1 2 3 4 5
60 70 80 90 100
110 120 130 140 150
```

0 at {1 0 1} M A 0 at alternate rows
 0 0 0 0 0
 6 7 8 9 10
 0 0 0 0 0

A Part II: substitution agreement

A selection & subs agreement are independent

'A'at{1 0 1} M A scalar substitution (V16)
 A A A A A
 6 7 8 9 10
 A A A A A

'AB'at{1 0 1} M A vector substitution
 A A A A A
 6 7 8 9 10
 B B B B B

(2 5pA)at{1 0 1} M A matrix substitution
 A B C D E
 6 7 8 9 10
 F G H I J

A Part III: General definition (the geeky bit)

A $\dots(M @ S)A$ A for selection function S

A $(pS A) \equiv n \uparrow pA$ A shape of mask, where:

A V16: $n = ppA$ A mask shape must match
 A Ext: $n \leq ppA$ A mask shape is a prefix

A $Y \leftarrow (,S A) \neq ,[\uparrow n]A$ A selection Y
 A $Z \leftarrow M \rightarrow Y$ A new values $\dots(M @ S)A$

A
 A $(pZ) \equiv j \uparrow k, n \downarrow pA$ A new values shape
 A where: $k \equiv +/, S A$ A \neq of masked items
 A V16: $j \in 0 1$ A scalar or full-fit
 A Ext: $j \leq ppA$ A new values are prefix

A
 A $X \leftarrow Z \circ \rightarrow V p 0$ A new values extended
 A $V \equiv (ppZ) \downarrow pA$ A by trailing shape

A For example:

A $(pA) \equiv 3 4 5 6 7$ A rank-5 subject array

A $(pS A) \equiv 3 4$ A rank-2 mask
 A $(+/,S A) \equiv 8$ A \neq of selected 3-cells

```

A      (pY) ≡ 8 5 6 7      A shape of selection
A      Z ← M→Y             A new values ..(M @ S) A
A      (pZ) ≡ 8 5          A (say)
A      P ← Z ◦.→ 6 7p0    A padded result array
A      (pP) ≡ 8 5 6 7     A result fits selection

```

A Examples:

```

      '*'-at{1 0 1} 3 4p 12      A vector vs matrix
* * * *
5 6 7 8
* * * *

```

```

      '*'-at((1=10|>)ö2)5 5 5p 175  A Aaron's example
* * * * *
* * * * *
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* * * * *
* * * * *

```

```

26 27 28 29 30
31 32 33 34 35
36 37 38 39 40
41 42 43 44 45
46 47 48 49 50

```

```

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```

```

26 27 28 29 30
31 32 33 34 35
36 37 38 39 40
41 42 43 44 45
46 47 48 49 50

```

```

      10×at{3 4p1 0 0} 3 4 5p 15      A higher rank
10 20 30 40 50
 1  2  3  4  5
 1  2  3  4  5
10 20 30 40 50

```

1 2 3 4 5
1 2 3 4 5
10 20 30 40 50
1 2 3 4 5

1 2 3 4 5
10 20 30 40 50
1 2 3 4 5
1 2 3 4 5

A References:

A http://dfns.dyalog.com/n_at.htm

A Google[dyalog prefix]