

# Under $u \& . v$ $mv$ $mv$ $mv$

The verb  $u \& . v$  is equivalent to the composition  $u \& v$  except that the verb obverse to  $v$  is applied to the result for each cell. The obverse is normally the inverse, as discussed more fully under the power conjunction  $\wedge$ .

$3 \ +\&.\ ^\cdot 4$  Inverse of natural log is the exponential  
 12

$(\ ^\cdot\ \wedge\ \_1) (\ ^\cdot\ 3) + (\ ^\cdot\ 4)$   
 12

$(\ <|) , \ <| . \ b = : \ 1 \ 2 \ 3 ; \ 2 \ 3 \ 5 \ 7 ; \ 'abcde'$

+-----+-----+-----+-----+
1 2 3   2 3 5 7   abcde     abcde   2 3 5 7   1 2 3
+-----+-----+-----+-----+

$each = : \ \& . \ >$  An adverb  
 $(\ <| . \ \& . \ > \ b) , (\ <| . \ each \ b)$  Reversal under open

+-----+-----+-----+-----+
3 2 1   7 5 3 2   edcba     3 2 1   7 5 3 2   edcba
+-----+-----+-----+-----+

In mathematics, certain cases of under are called dual or, dual with respect to:

$f = : \ + . \ \& . \ - .$  Dual with respect to boolean negation  
 $f / \sim \ d = : \ 0 \ 1$   
 0 0  
 0 1

$D = : \ \& . \ - .$  The adverb dual with respect to negation  
 $(\ + . \ D / \sim \ d) ; (\ * . / \sim \ d) ; (\ = \ D / \sim \ d) ; (\ \sim : / \sim \ d)$

+-----+-----+-----+-----+
0 0   0 0   0 1   0 1
0 1   0 1   1 0   1 0
+-----+-----+-----+-----+

$DWL = : \ \& . \ ^\cdot .$  Dual with respect to natural logarithm  
 $DAN = : \ \& . \ -$  Dual with respect to arithmetic negation  
 $(\ 3 \ + \ DWL \ 4) , (3 * 4) , (3 \ < . \ DAN \ 4) , (3 \ > . \ 4)$   
 12 12 4 4