

APPENDIX A

The user-defined functions listed in this appendix simulate the partition operator in combination with various primitive functions. In particular, where P and B are Boolean vectors and V is a numeric vector, the correspondence is as follows:

$P+(\wedge/) B \leftrightarrow P \underline{PANDRED} B$	$P+(\uparrow/) V \leftrightarrow P \underline{PMAXRED} V$
$P+(\wedge\backslash) B \leftrightarrow P \underline{PANDSCAN} B$	$P+(\uparrow\backslash) V \leftrightarrow P \underline{PMAXSCAN} V$
$P+(\vee/) B \leftrightarrow P \underline{PORRED} B$	$P+(\downarrow/) V \leftrightarrow P \underline{PMINRED} V$
$P+(\vee\backslash) B \leftrightarrow P \underline{PORSCAN} B$	$P+(\downarrow\backslash) V \leftrightarrow P \underline{PMINSCAN} V$
$P+(\equiv/) B \leftrightarrow P \underline{PEQRED} B$	$P+\uparrow V \leftrightarrow P \underline{PGRADEUP} V$
$P+(\equiv\backslash) B \leftrightarrow P \underline{PEQSCAN} B$	$P+\downarrow V \leftrightarrow P \underline{PGRADEDOWN} V$
$P+(\neq/) B \leftrightarrow P \underline{PNERED} B$	$P+(\div/) V \leftrightarrow P \underline{PPLRED} V$
$P+(\neq\backslash) B \leftrightarrow P \underline{PNESCAN} B$	$P+(\div\backslash) V \leftrightarrow P \underline{PPLSCAN} V$
$P+(\lt;/) B \leftrightarrow P \underline{PLTRED} B$	$P+(\div/) B \leftrightarrow P \underline{PPLREDB} B$
$P+(\lt;\backslash) B \leftrightarrow P \underline{PLTSCAN} B$	$P+\phi V \leftrightarrow P \underline{PREVERSE} V$

[1] $\nabla Z+P \underline{PANDRED} V$
 $Z+(V \leq P)/P \diamond Z+(Z/1\phi Z) \wedge P/V$
 ∇

[1] $\nabla Z+P \underline{PANDSCAN} V$
 $Z+\sim z \setminus (V \leq P) \setminus 'z' N \Delta \sim (V \leq P)/V$
 ∇

[1] $\nabla Z+P \underline{PORRED} V$
 $Z+(V \vee P)/P \diamond Z+(Z/1\phi Z) \leq P/V$
 ∇

[1] $\nabla Z+P \underline{PORSCAN} V$
 $Z+z \setminus (V \vee P) \setminus 'z' N \Delta (V \vee P)/V$
 ∇

[1] $\nabla Z+P \underline{PEQRED} V$
 $Z+'= ' N \Delta (1\phi P) / = \setminus V$
 ∇

[1] $\nabla Z+P \underline{PEQSCAN} V$
 $Z+= \setminus V \neq P \setminus 'z' N \Delta \sim P / = \setminus ^{-1} + 1, V$
 ∇

[1] $\nabla Z+P \underline{PNERED} V$
 $Z+' \neq ' N \Delta (1\phi P) / \neq \setminus V$
 ∇

[1] $\nabla Z+P \underline{PNESCAN} V$
 $Z+z \setminus V \neq P \setminus 'z' N \Delta P / z \setminus ^{-1} + 0, V$
 ∇

[1] $\nabla Z+P \underline{PLTRED} V$
 $Z+(P \geq V = 1\phi P) / P$
 [2] $Z+(Z/1\phi Z) \wedge P / V = 1\phi P$
 ∇

[1] $\nabla Z+P \underline{PLTSCAN} V$
 $Z+(V \wedge P) \vee (V \vee P) \setminus ' > ' N \Delta (V \vee P) / V$
 ∇

[1] $\nabla Z+P \underline{PMAXRED} V$
 $Z+V[(\uparrow V)[P/\uparrow(+\backslash P)[\uparrow V]]]$
 ∇

[1] $\nabla Z+P \underline{PMAXSCAN} V$
 $Z+\uparrow(\uparrow V)[\uparrow(+\backslash P)[\uparrow V]]$
 [2] $Z+V[Z_1[\uparrow Z]]$
 ∇

[1] $\nabla Z+P \underline{PMINRED} V$
 $Z+V[(\downarrow V)[P/\downarrow(+\backslash P)[\downarrow V]]]$
 ∇

[1] $\nabla Z+P \underline{PMINSCAN} V$
 $Z+\downarrow(\downarrow V)[\downarrow(+\backslash P)[\downarrow V]]$
 [2] $Z+V[Z_1[\downarrow Z]]$
 ∇

[1] $\nabla Z+P \underline{PGRADEUP} V$
 $Z+\square I \bar{O}+(\uparrow V)[\uparrow(+\backslash P)[\uparrow V]] - \lceil \setminus P \times 1 \rho P$
 ∇

[1] $\nabla Z+P \underline{PGRADEDOWN} V$
 $Z+\square I \bar{O}+(\downarrow V)[\downarrow(+\backslash P)[\downarrow V]] - \lceil \setminus P \times 1 \rho P$
 ∇

[1] $\nabla Z+P \underline{PPLRED} V$
 $Z+' \div ^{-1} N \Delta (1\phi P) / + \setminus V$
 ∇

[1] $\nabla Z+P \underline{PPLSCAN} V$
 $Z++ \setminus V - P \setminus ' - ' N \Delta P / + \setminus ^{-1} + 0, V$
 ∇

[1] $\nabla Z+P \underline{PPLREDB} V$
 $Z+((\downarrow \vee P) / P), 1$
 [2] $Z+(1+' - ' N \Delta Z / 1 \rho Z) \sim \sim P / V$
 ∇

[1] $\nabla Z+P \underline{PREVERSE} V$
 $Z+V[\phi \uparrow + \setminus P]$
 ∇