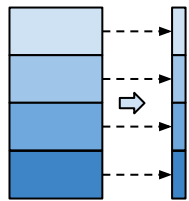


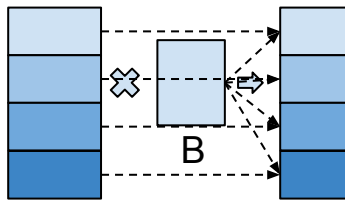
A C

(a) $C = \text{supply}(A, \text{"abs"})$



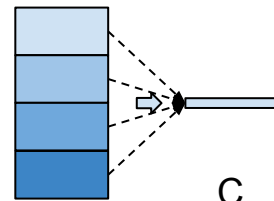
A C

(c) $C = \text{agg.row}(A, \text{"+"})$



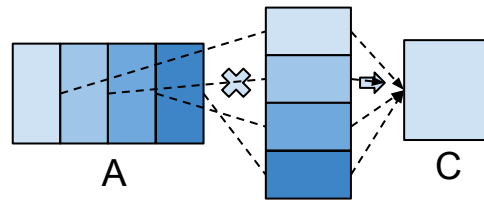
A B C

(e) $C = \text{multiply}(A, B)$



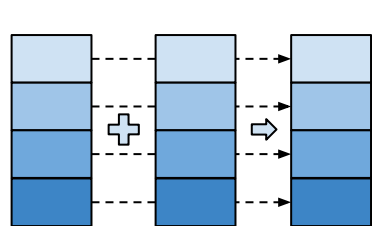
A C

(g) $C = \text{agg.col}(A, \text{"+"})$



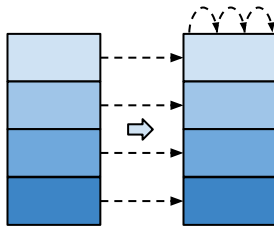
A B C

(i) $C = \text{multiply}(A, B)$



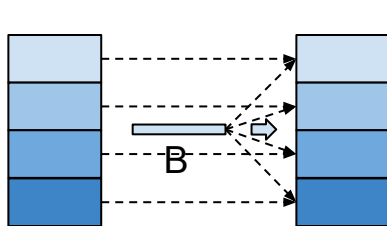
A B C

(b) $C = \text{mapply}(A, B, \text{"+"})$



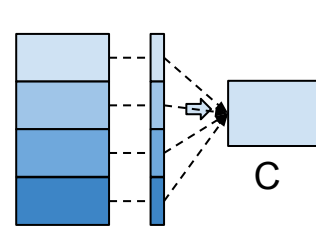
A C

(d) $C = \text{cum.col}(A, \text{"+"})$



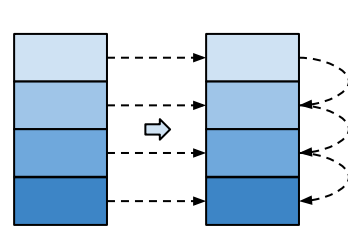
A B C

(f) $C = \text{groupby.col}(A, B, \text{"+"})$



A B C

(h) $C = \text{groupby.row}(A, B, \text{"+"})$



A C

(j) $C = \text{cum.row}(A, \text{"+"})$