Right

$$\begin{pmatrix} 0.5 & 0.5 \\ 0.9 & 0.1 \end{pmatrix} \begin{matrix} = 1 \\ = 1 \end{matrix}$$

Left

$$\begin{pmatrix} 0.5 & 0.9 \\ 0.5 & 0.1 \end{pmatrix}$$

$= 1 \quad = 1$

Double

$$\begin{pmatrix} 0.1 & 0.9 \\ 0.9 & 0.1 \end{pmatrix} \begin{matrix} = 1 \\ = 1 \end{matrix}$$

$= 1 \quad = 1$

(a)

ATGATCATA

	A	C	G	T
A	0	1	0	0
C	0.33	0	0.33	0.33
G	1	0	0	0
T	1	0	0	0

(c)

ATGATCATA

$$Tr_{AT} = \frac{counts(D_{AT})}{counts(N_A)} = \frac{3}{3} = 1$$

ATGATCATA

to *t*

From *f*	A	T	G	C
A	0	1	0	0
T	0	0	0	0
G	0	0	0	0
C	0	0	0	0

ATGATCATA

$$Tr_{TG} = \frac{counts(D_{TG})}{counts(N_T)} = \frac{1}{3} = 0.33$$

ATGATCATA

to *t*

From *f*	A	T	G	C
A	0	1	0	0
T	0	0	0.33	0
G	0	0	0	0
C	0	0	0	0

ATGATCATA

$$Tr_{GA} = \frac{counts(D_{GA})}{counts(N_G)} = \frac{1}{1} = 1$$

ATGATCATA

to *t*

From *f*	A	T	G	C
A	0	1	0	0
T	0	0	0.33	0
G	1	0	0	0
C	0	0	0	0

ATGATCATA

$$Tr_{AT} = \frac{counts(D_{AT})}{counts(N_A)} = \frac{3}{3} = 1$$

ATGATCATA

(b)

to *t*

From *f*	A	T	G	C
A	0	1	0	0
T	0	0	0.33	0
G	1	0	0	0
C	0	0	0	0

Computation of transition matrices

Computation of transition matrices. (**a**) shows the types of transition matrices, namely the right stochastic matrix, the left stochastic matrix and the double stochastic matrix. Note that a transition matrix or a stochastic matrix are two names that represent the same thing. (**c**) shows just the first four steps in computing a right transition matrix from a sequence “ATGATCATA”. (**b**) Shows the final transition matrix for sequence “ATGATCATA”.

Cite this work as:

Paul A. Gagniuc. *Algorithms in Bioinformatics: Theory and Implementation*. John Wiley & Sons, Hoboken, NJ, USA, 2021, ISBN: 9781119697961.