Real World Algorithms: A Beginners Guide
Errata to the Second Printing

Last updated 20 May 2018

This document lists the changes that should be made to *Real World Algorithms* to correct mistakes that made their way to printing, to improve infelicities that the author spotted too late, or update the material with something that the author did not know at the time of writing the book.
There are three different kinds of changes noted here. In all of them the date that they became known to the author is given at the first line of each item. The name of the person who suggested the change is also given at the end of each change.

► **Page 1**, line 1 — 1 Jan 1

These are technical or typographical errors.

Page 1, line 1 — 1 Jan 1

These as changes that improve the book, even if they do not correct an error. They include small rewordings, or material that became known to the author after the book was published.

Page 1, line 1 — 1 Jan 1

These are minor fixes that although they do not make a big difference they do hurt the author. Some of them might strain the reader's eye to see where the improvement is exactly.

► **Page 20**, line −1 — 14 Feb 2018

we cannot execute line 7 more than n times. ↯ we cannot execute line 7 more than $n - 1$ times; note that the last day is pushed, but not popped. (K. Marinakos)

► **Page 32**, line −2 — 16 Feb 2018

2.5×10^{25}, or 7 septillion ↯ 2.5×10^{19}, or 25 quintillion (K. Marinakos)

► **Page 32**, line 8 — 16 Feb 2018

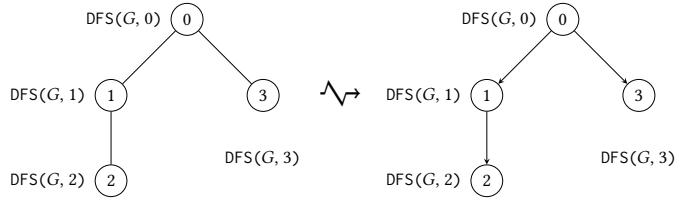
In an adjacency matrix, vertices are represented by row and column indices, and vertices are represented by the contents of the matrix. ↯ In an adjacency matrix, the vertices are represented by row and column indices, and the edges are represented by the contents of the matrix. (K. Marinakos)

► **Page 39**, line −5 — 16 Feb 2018

Similarly, if $|E|$ is the number of edges in the graph, ↯ Similarly, if $|E|$ is the number of edges in the graph, counting undirected edges twice, (K. Marinakos)

► **Page 44**, figure 2.21 — 17 Feb 2018

Add arrows so that the graph is directed:



(K. Marinakos)

► **Page 49**, algorithm 2.3, line 7 — 16 Feb 2018

$c \leftarrow \mathsf{Pop}(s)$ ↯ $c \leftarrow \mathsf{Pop}(S)$ (K. Marinakos)

► **Page 50**, lines 2–4 — 16 Feb 2018

Line 2 is executed $|V|$ times, once per each vertex. Then $\mathsf{DFS}(G, node)$ is called exactly once per edge, in line 4, that is, $|E|$ times. ↯ Line 4 is executed $|V|$ times, once per each vertex. The condition in line 3 is called exactly once for each edge of every adjacency list, that is, $|E|$ times.

► **Page 54**, line 5 — 16 Feb 2018

we only node ↯ we only note (K. Marinakos)

► **Page 49**, line 4 — 17 Feb 2018

the same as algorithm 2.4 ↝ the same as algorithm 2.3 (K. Marinakos)

► **Page 55**, figure 2.28a — 17 Feb 2018

rename nodes 7 and 8 to 6 and 7 respectively (K. Marinakos)

► **Page 61**, line 7 — 26 Feb 2018

with number in different number systems ↝ with numbers in different number systems (K. Marinakos)

► **Page 61**, lines 17–18 — 26 Feb 2018

The binary number 1010 has value 14 ↝ The binary number 1110 has value 14 (K. Marinakos)

► **Page 69**, line −13 — 26 Feb 2018

Each element of the priority tree ↝ Each element of the priority queue (K. Marinakos)

► **Page 72**, line −2 — 26 Feb 2018

larger than its parent ↝ lighter than its parent (K. Marinakos)

► **Page 73**, line −1 — 26 Feb 2018

larger than its children ↝ smaller than its children (K. Marinakos)

► **Page 161**, line 14 — 26 Mar 2018

Beceause ↝ Because (K. Marinakos)

► **Page 173**, figure 7.4 — 19 Mar 2018

was astonished whenever it shone in her face. Close by was astonished whenever it shone in her face. Close by the

↝

was astonished whenever it shone in her face. Close by was astonished whenever it shone in her face. Close by the

► **Page 180**, line −17 to −16 — 19 Mar 2018

then the number of nodes cannot be more than the number of edges ↝ then the number of nodes minus the source cannot be more than the number of edges

► **Page 192**, figure 8.3 (h) — 21 Mar 2018

$\underline{5/R_2}$ ↝ $\underline{5/R_3}$ (M. E. Kostopoulou)

► **Page 194** line −4 — 26 Mar 2018

exactly one ↯ exactly once (K. Marinakos)

► **Page 196** line −7 — 26 Mar 2018

$(2,1)$ ↯ $(2,2)$ (K. Marinakos)

► **Page 196** line −1 — 26 Mar 2018

eighth ↯ seventh (K. Marinakos)

► **Page 198** line 12 — 26 Mar 2018

they story short ↯ the story short (K. Marinakos)

► **Page 231** lines 8–9 — 18 Apr 2018

A beats B by 60 to 40, B beats C by 60 to 40, and C beats A by 60 to 40 ↯ A beats B by 60 to 30, B beats C by 60 to 30, and C beats A by 60 to 30 (K. Marinakos)

► **Page 232** line 1 — 18 Apr 2018

$i = 1, 2, \ldots n$ ↯ $i = 1, 2, \ldots, n$

► **Page 232** line −11 — 18 Apr 2018

This requires $\Theta(|B|^2)$ time. ↯ This requires $\Theta(|C|^2)$ time. (K. Marinakos)

► **Page 233** line 2 — 18 Apr 2018

runs in $O(|C|^2 + |B|^2)$ time. ↯ runs in $O(|C|^2 + |B||C|^2)$ time (K. Marinakos)

► **Page 241**, algorithm 10.3, Input — 18 Apr 2018

S, an array of size $n \times n$ with the strongest paths between nodes; $s[i, j]$ is the strongest path between nodes i and j

↯

S, an array of size $n \times n$ with the strengths of the strongest paths between nodes; $s[i, j]$ is the strength of the strongest path between nodes i and j

► **Page 241**, algorithm 10.3, Output — 18 Apr 2018

wins, a list of size n; item i of *wins* is a list containing m integer items $j_1, j_2, \ldots, j_m$ for which $S[i, j_k] > S[j_k, i]$

↯

wins, an array of size n; item i of *wins* is a list containing m integer items $j_1, j_2, \ldots, j_m$ for which $S[i, j_k] > S[j_k, i]$

► **Page 241**, algorithm 10.3, line 1 — 18 Apr 2018

wins ← `CreateList()`

↯

wins ← `CreateArray(`n`)`

► **Page 241**, algorithm 10.3, line 4 — 18 Apr 2018

`InsertInList(`*wins*, NULL, *list*`)`
↯
wins[*i*] ← *list*

► **Page 241**, lines 3–4 — 18 Apr 2018

a list *wins* such that item *i* of the list *wins* ↯ an array *wins* such that item *i* of the array *wins* (K. Marinakos)

► **Page 241** line −7 — 18 Apr 2018

$O(|C|^2 + |B|^2)$ time ↯ $O(|C|^2 + |B||C|^2)$ time (K. Marinakos)

Page 341, line 2 — 20 May 2018

$$v_4 = 3,276,858 + \texttt{Ordinal}(\text{“O”}) = +3,276,858 + 14 = 3,276,872$$

↯

$$v_4 = 3,276,858 + \texttt{Ordinal}(\text{“O”}) = 3,276,858 + 14 = 3,276,872$$

► **Page 446**, line −4 to −3 — 20 May 2018

The time to create table *rt* is $O(m)$ ↯ The time to create *rt* is $O(m + s)$

► **Page 446**, line −2 — 20 May 2018

longer than m ↯ longer than $m + s$

Page 456, line 10 — 20 May 2018

But a whole lot more of them. ↯ But a whole lot more of them before it starts repeating itself.