C.A.G.E.S. errata

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This page contains corrections and comments on the first edition of *Combinatorial Algorithms: Generation, Enumeration and Search*, by Donald L. Kreher and Douglas R. Stinson.

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Errata List

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Thanks to everyone who has pointed out errors, especially Steve Weller, Joe Culberson, Alfred Menezes and Clement Lam.

Page 17 line 3: There should not be the white space between NP-complete and Problem.

Page 28 Exercise 1.13: $\{01\}\{12\}\{23\}\{34\}\{04\}\{05\}\{16\}\{27\}\{38\}\{49\}\{57\}\{79\}\{69\}\{68\}\{58\}$.

Page 41 line 18: $b_i = b_{i+i} + a_i \bmod 2$

Page 52 line 8: Other special cases were avoided by using t_0 as a dummy variable.

Page 55 line -1: $\pi[i] = \pi'[i-1]$

Page 55 Algorithm 2.16 line 4: $d \leftarrow \mathsf{mod}(r, (j+1)!)/j!$

Page 65: The last sentence of Exercise 2.14 should be reworded as follows: At each step, this algorithm should change one element x to another element y, or interchange two adjacent elements.

Page 69 3rd last line: The fixed integer should be n, not m.

Page 71 In Theorem 3.3 assume that $m > n$. (If $m = n$, then Theorem 3.3 is true provided we define $P(0,0) = 1$.)

Page 72 Algorithm 3.5: **for** $j \leftarrow 1$ **to** $\min\{i, m\}$

Page 72 Theorem 3.4:

$$\begin{aligned} P(0) &= 1 \\ P(m) &= \sum_{\{j\geq 1: 3j^2-j\leq 2m\}} (-1)^{j+1} P\left(m - \frac{3j^2-j}{2}\right) \\ &\quad + \sum_{\{j\geq 1: 3j^2+j\leq 2m\}} (-1)^{j+1} P\left(m - \frac{3j^2+j}{2}\right). \end{aligned}$$

Page 73 Table 3.1:

		$P(m,n)$									
m	$P(m)$	$n=1$	2	3	4	5	6	7	8	9	10
1	1	1									
2	2	1	1								
3	3	1	1	1							
4	5	1	2	1	1						
5	7	1	2	2	1	1					
6	11	1	3	3	2	1	1				
7	15	1	3	4	3	2	1	1			
8	22	1	4	5	5	3	2	1	1		
9	30	1	4	7	6	5	3	2	1	1	
10	42	1	5	8	9	7	5	3	2	1	1
11	56	1	5	10	11	10	7	5	3	2	1
12	77	1	6	12	15	13	11	7	5	3	2
13	101	1	6	14	18	18	14	11	7	5	3
14	135	1	7	16	23	23	20	15	11	7	5
15	176	1	7	19	27	30	26	21	15	11	7
16	231	1	8	21	34	37	35	28	22	15	11
17	297	1	8	24	39	47	44	38	29	22	15
18	385	1	9	27	47	57	58	49	40	30	22
19	490	1	9	30	54	70	71	65	52	41	30
20	627	1	10	33	64	84	90	82	70	54	42
21	792	1	10	37	72	101	110	105	89	73	55
22	1002	1	11	40	84	119	136	131	116	94	75
23	1255	1	11	44	94	141	163	164	146	123	97
24	1575	1	12	48	108	164	199	201	186	157	128
25	1958	1	12	52	120	192	235	248	230	201	164
26	2436	1	13	56	136	221	282	300	288	252	212
27	3010	1	13	61	150	255	331	364	352	318	267
28	3718	1	14	65	169	291	391	436	434	393	340
29	4565	1	14	70	185	333	454	522	525	488	423
30	5604	1	15	75	206	377	532	618	638	598	530

Page 74 Algorithm 3.6: while $\omega \leq i$

Page 75 In the example tabulating the partitions in $\mathcal{P}(10,4)$, the 4th row of the standard form column should be $[4,4,1,1]$, not $[4,4,2,1]$.

Page 88 Line 9: Replace 0 with 11.

page 104 Exercise 3.17 $C_0 = 1$, not 0.

page 109 The list of cliques in the graph in Figure 4.2 contain the following errors. The cliques $\{0\},\ldots,\{6\}$ and $\{5,6\}$ are missing. Also, $\{1,3,4\}$ should be $\{2,3,4\}$ in this list and in the maximal clique list.

Page 120 Algorithm 4.6: $\mathcal{C}'_\ell$ should be listed as global.

Page 129 Theorem 4.2:

$$\mathsf{cost}(X') \geq \sum_{i=0}^{\ell-2} \mathsf{cost}(x_i, x_{i+1}) + \mathsf{b}(x_{\ell-1}, \mathcal{Y}) + \sum_{y \in \mathcal{Y}} \mathsf{b}(y, \mathcal{Y} \cup \{x_0\}).$$

Page 129 Line -5:

$$\sum_{i=0}^{\ell-2} \mathsf{cost}(x_i, x_{i+1})$$

Page 130 Line 4:

$$\textsc{MinCostBound}(X) = \sum_{i=0}^{\ell-2} \mathsf{cost}(x_i, x_{i+1}) + \mathsf{b}(x_{\ell-1}, \mathcal{Y}) + \sum_{y \in \mathcal{Y}} \mathsf{b}(y, \mathcal{Y} \cup \{x_0\})$$

Page 130 Line 6:

$$\textsc{MinCostBound}(X) = \sum_{i=0}^{\ell-2} \mathsf{cost}(x_i, x_{i+1}) + \mathsf{cost}(x_{n-1}, x_0)$$

Page 134 Table 4.3: MinEdgeBound should be MinCostBound.

Page 143 Table 4.6: MinEdgeBound should be MinCostBound.

Page 145 Exercise 4.1 part (b): There are four walks of length one, not three.

Page 147 Exercise 4.9: The vertex set should be $\{0,..9,a,b,c,d,e,f\}$ (e,f are missing).

Page 148 Exercise 4.10: Theorem 4.4 should be Lemma 4.4 (twice).

Page 148 Line -21: number of n-tuples in a length n non-linear code of minimum distance d. **Page 171 Line 13:** Replace "computer" with "compute".

Page 174 Algorithm 5.19: Comma between NumBlocks and Other.

Page 191 Definition 6.1: Replace $g * \mathbf{I} = g$ with $g * \mathbf{I} = \mathbf{I} * g = g$.

Page 191 Definition 6.1: Replace $g^{-1} * g = \mathbf{I}$ with $g^{-1} * g = g * g^{-1} = \mathbf{I}$.

Page 209 Algorithm 6.9 Line 7: **for** $j \leftarrow 0$ **to** i

Page 209 Algorithm 6.9 line 9 (**): $\textsc{Mult}(n, g, h, f)$

Page 216 Algorithm 6.13 line 11: Insert the statement $P[j] \leftarrow$ **false** after the statement $j \leftarrow i$

Page 216 Algorithm 6.13 line -17: Replace the then clause with **for** $i \leftarrow 1$ **to** n
  do $c[i] \leftarrow 0$
for $i \leftarrow 1$ **to** N
  do $c[V_2[i]] \leftarrow c[V_2[i]] + 1$
$prod \leftarrow 1$
for $i \leftarrow 1$ **to** n
  do $prod \leftarrow prod\binom{T[i]}{c[i]}$
$V_3[k] \leftarrow V_3[k] + prod$

Page 218 Line -1 : RunRepBacktrack should be OrbRepBackTrack.

Page 222 Algorithm 6.16 line -6: $A \cup \{x\}$

Page 222 Algorithm 6.16 line -2: U_k

Page 222 Algorithm 6.16 line -1: $g[x]$

Page 240 Definition 7.4 line 5:

$$B[i] = \{v \in \mathcal{V} : D(\mathcal{G}, v) = i\}.$$

Page 243: Replace $N \leftarrow N + m - 1$ with $N \leftarrow N + m_i - 1$.

Page 245 first line of 7.3.1 : Replace ”Recall a that” with ”Recall that a”.

Page 253 Line -7: Replace ”that problem of determining is” with ”that the problem of determining if”

Page 254 definition of neighbor in definition 7.6: Replace $\{u, v\}$ with $\{u, x\}$.

Page 254 4th Line after definition: Replace $v \in V[i]$ with $v \in B[i]$.

Page 257 Line 4: There is a missing right $\}$

Page 263: In Algorithm 7.7 the line following **if** $BestExist$ should be **for** $i \leftarrow 0$ **to** $\ell - 1$.

Page 263: In Algorithm 7.8 add $BestExist \leftarrow$ **false** before $\textsc{Canon}1(\mathcal{G}, \mathcal{P})$.

Page 263 Line -3 of Algorithm 7.8 : Replace x by C.

Page 272 Line -1: Replace "if and only if B with "if and only if $x \in B$."

Page 277 line -11: $\{1, 2, \cdots, m\}$

Page 278 line -7: $\mathbb{Z}_p$

Page 280 line 1: is a (0,1)-valued solution

Page 280 line -2: minimum (non-zero) value

Page 281 lines -5 to -1: ten of the b_is are missing "arrows"

Page 284 line 1: ...,b_n

Page 284 line 11: $\vec{b}_j^*$

Page 286 line -7: the j-th component

Page 286 line -2: for all $j = 1, 2, \cdots, n$, the j-th component

Page 286 line -1: $|x_j|$

Page 287 line 2: $|x_j|$

Page 287 line 7: $|x_j|$

Page 291 Algorithm 8.1 line -5: Insert the statement $([b_1^*, b_2^*, \ldots, b_n^*], \{\alpha_i j\}_{i<j}) \leftarrow$ $\text{GRAM-SCHMIDT}(b_1, b_2, \ldots, b_n)$ before the if statement and after the do loop.

Page 314 Reference [65]: Page numbers should be 224-226.