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80th Anniversary of the birth of Prof. Donald Knuth (1938)

Anton Iliev[1,2], Nikolay Kyurkchiev[1,2]

[1]Faculty of Mathematics and Informatics,
University of Plovdiv Paisii Hilendarski,
24, Tzar Asen St., 4000 Plovdiv, Bulgaria,
e-mails: aii@uni-plovdiv.bg, nkyurk@uni-plovdiv.bg

[2]Institute of Mathematics and Informatics,
Bulgarian Academy of Sciences,
Acad. G. Bonchev St., Bl. 8, 1113 Sofia, Bulgaria

In this year one of the most famous people in theoretical Computer Science Prof. Knuth celebrates his 80th birthday [1]-[4].

Donald Knuth was born on January 10, 1938, Milwaukee, Wisconsin, U.S. He is a computer scientist, mathematician, and professor at Stanford University. His achievements are mainly in algorithm's analysis and computational complexity. Knuth is the creator of the TEX computer typesetting system. He is the author of a book on computer programming language compilers. Knuth decided that there is no adequate description of computer science theory which motivated him to write the fundamental book "The Art of Computer Programming" which is among the most influential books in Computer Science ever as well as it is among the most cited books nowadays in this field. His

Citation: Anton, Iliev, Nikolay Kyurkchiev, 80^{th} Anniversary of the birth of **Prof. Donald Knuth**, http://dx.doi.org/10.11145/bmc.2018.04.257

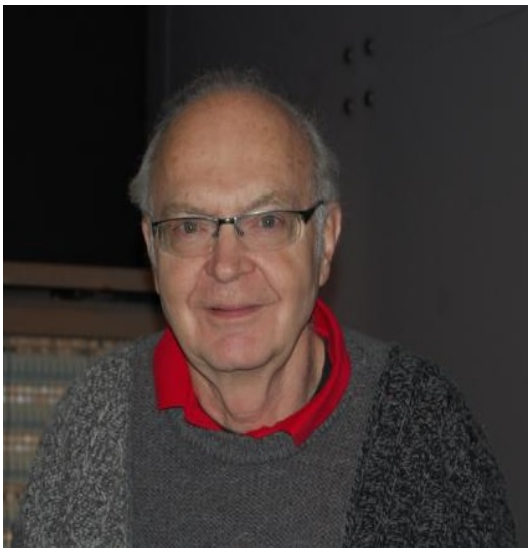

Figure 1: Donald Knuth - photo is from his 80^{th} jubilee.

idea to present Computer Programming as an art was nonstandard in these days. When Knuth decided to write the book he made plans for six volumes, at the end the book appeared in seven volumes.

Before publishing the first part of "The Art of Computer Programming", Knuth left Caltech and became an employee of the Institute for Defense Analyses' Communications Research Division. His main duties involved serious mathematical research in cryptography.

Knuth's ideas are developed further by many scientists. We too worked on improving some of the algorithms from "The Art of Computer Programming", vol. 2, [5]-[12]. Some algorithms developed mainly by Prof. Knuth are optimized and the new realizations are processor' and compiler' independent [5]. The book [5] and the paper [7] are personally dedicated to him.

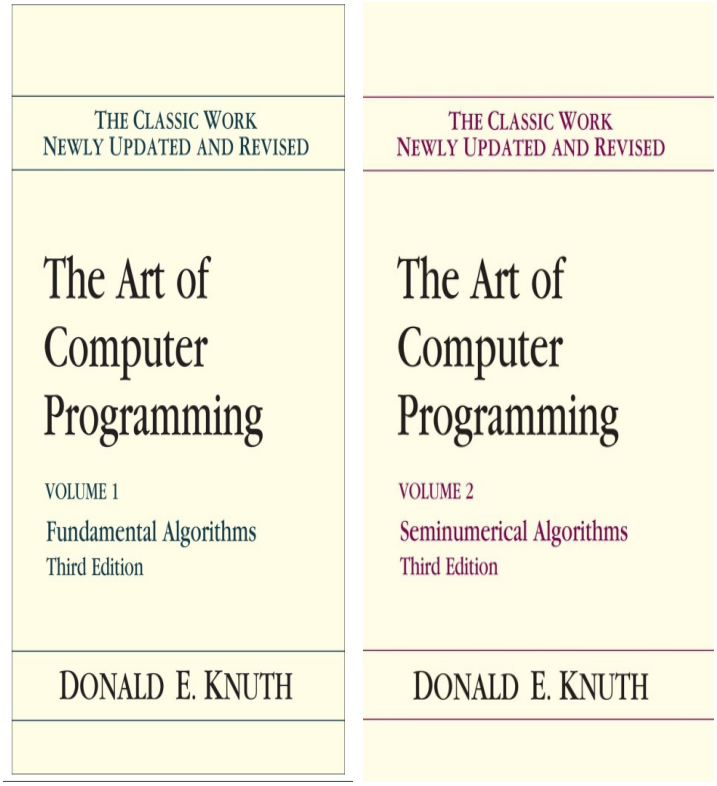

Figure 2: Photos of the covers of vol. 1 and vol. 2 of Knuth's book (sources are from https://www.wikipedia.org/).

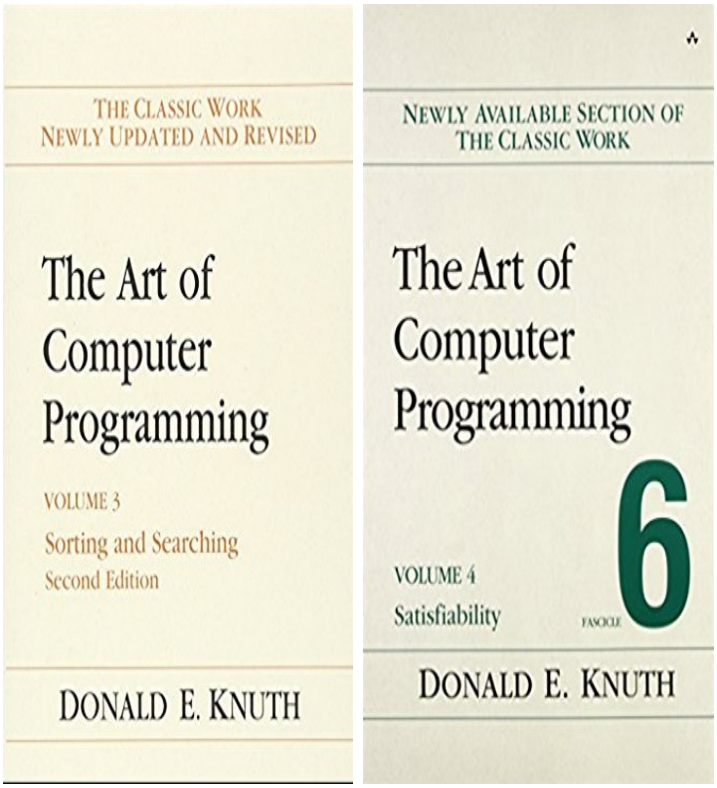

Figure 3: Photos of the covers of vol. 3 and vol. 4 of Knuth's book (sources are from https://www.wikipedia.org/).

Figure 4: Photo of all Knuth's books, by Hector Garcia-Molina, March 15, 2015.

Figure 5: The book which we dedicated to Prof. Knuth in 2018 [5].

Acknowledgments

This work was supported by project FP17-FMI-008 of the Department for Scientific Research, Paisii Hilendarski University of Plovdiv.

References

[1] Donald Knuth. https://en.wikipedia.org/wiki/Donald_Knuth

[2] All Questions Answered, Notices of the AMS, 49 (3), 2002, 318-324.

[3] L. Shustek, The 'Art' of Being Donald Knuth, Communications of the ACM, 51 (7), 2008, 35-39, doi: 10.1145/1364782.1364794.

[4] L. Shustek, Donald Knuth: A Life's Work Interrupted, Communications of the ACM, 51 (8), 2008, 31-35, doi: 10.1145/1378704.1378715.

[5] A. Iliev, N. Kyurkchiev, New Trends in Practical Algorithms: Some Computational and Approximation Aspects, LAP LAMBERT Academic Publishing, Beau Bassin, 2018.

[6] A. Iliev, N. Kyurkchiev, A Note on Knuth's Implementation of Euclid's Greatest Common Divisor Algorithm, International Journal of Pure and Applied Mathematics, 117, 2017, 603-608.

[7] A. Iliev, N. Kyurkchiev, A. Golev, A Note on Knuth's Implementation of Extended Euclidean Greatest Common Divisor Algorithm, International Journal of Pure and Applied Mathematics 118 (1), 2018, 31-37.

[8] A. Iliev, N. Kyurkchiev, A. Rahnev, A Note on Adaptation of the Knuth's Extended Euclidean Algorithm for Computing Multiplicative Inverse, International Journal of Pure and Applied Mathematics, 118, 2018, 281-290.

[9] Iliev, A., Kyurkchiev, N., A Note on Euclidean and Extended Euclidean Algorithms for Greatest Common Divisor for Polynomials, International Journal of Pure and Applied Mathematics, 118, 2018, (accepted).

[10] A. Iliev, N. Kyurkchiev, A Note on Least Absolute Remainder Euclidean Algorithm for Greatest Common Divisor, International Journal of Scientific Engineering and Applied Science, 4 (3), 2018, 31-34.

[11] A. Iliev, N. Kyurkchiev, A Note on Knuth's Algorithm for Computing Extended Greatest Common Divisor using SGN Function, International Journal of Scientific Engineering and Applied Science, 4 (3), 2018, 26-29.

[12] A. Iliev, N. Kyurkchiev, New Realization of Euclidean Algorithm, Collection of scientific works of Eleventh National Conference with International Participation Education and Research in the Information Society, Plovdiv, ADIS, June 1-2, (2018), (accepted) (in Bulgarian).