A Bibliography of Publications on Floating-Point Arithmetic

Norbert Juffa
2445 Mission College Blvd.
Santa Clara, CA 95054
USA
Tel: +1-408-727-1885
FAX: +1-408-727-1265
E-mail: juffa@ira.uka.de (Internet)

Nelson H. F. Beebe
University of Utah
Department of Mathematics, 110 LCB
155 S 1400 E RM 233
Salt Lake City, UT 84112-0090
USA
Tel: +1 801 581 5254
FAX: +1 801 581 4148
E-mail: beebe@math.utah.edu, beebe@acm.org, beebe@computer.org (Internet)
WWW URL: https://www.math.utah.edu/~beebe/

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Introduction

This is a bibliography of material on floating-point arithmetic that I came up with while doing research on a floating-point package of my own. I don’t claim it to be anywhere near complete. The material listed is only what I myself possess.

My main interest was in software based, binary floating-point arithmetic on a microprocessor, so you won’t find much material about the hardware used in floating-point arithmetic (e.g. adders, carry propagation schemes, higher radix
representation for multiplication and division, etc.) in this list. There is also not too much on non-binary floating-point arithmetic.

For most fields covered in this bibliography, the important or historically relevant articles should be included. There is also some material on integer arithmetic in this list as some of the methods used with integer arithmetic contain interesting ideas that may be useful in the realization of a floating-point arithmetic package.

Also, depending on the type of microprocessor used, one may need to implement integer multiplication and division for use in the floating-point package, so articles about this topic are included as well.

As I am German, there is a bit of material in German in this bibliography. However, English translations are provided for all non-English titles.

Thanks to the people who have helped me with previous versions of this document by sending me papers or additional references:

- Steven Sommars (sesv@research.bell-labs.com),
- Jim Kiernan (jmk@teak.cray.com),
- Warren Ferguson (ferguson@seas.smu.edu),
- Nhuan Doduc (ndoduc@framentec.fr),
- K. C. Ng (kwok.ng@eng.sun.com),
- Nelson H. F. Beebe (beebe@math.utah.edu).

Bibliography entries in the Books section are ordered alphabetically by author; ordering is by ascending year in the remaining sections.

**Warning:** it has yet not been possible to bring this citation list up-to-date with the entries in the bibliography.

### Books, hardware oriented

[1686, 272, 1263, 1194, 3075, 3278, 1881, 826, 1143, 984, 1431, 828, 1317, 7142, 7143, 1526]

### Books, software oriented or theory

[1250, 457, 460, 461, 113, 1394, 2357, 893, 1032, 343, 2915, 2398, 2932, 2235, 311, 517, 6997]

### Books, machine specific

[2140, 3180, 3077, 2400, 1732, 1868, 2253, 1900, 2435]
1 CHOICE OF BASE, FLOATING POINT FORMATS

Journal Publications, Conference Papers, Technical Reports, Ph.D. Dissertations, Book Contributions, etc.

1 Choice of base, floating point formats

1.1 Precision and Rounding

1.2 Determination of parameters of floating point arithmetic

1.3 IEEE standards for floating point arithmetic

1.4 Floating point arithmetic, general and implementation issues

1.5 Floating point packages

1.6 Floating point units
1.7 Test of floating point routines
[490, 1428, 1691, 1835, 1834, 1985, 1986, 1930, 2071, 2433, 2561, 2569, 2637, 2636, 2752, 2731, 2717, 3016]

2 Addition and Subtraction
[366, 1484]

2.1 Floating-point Summation
[316, 336, 353, 352, 559, 625, 663, 816, 1627, 2240, 2316]

2.2 Multiplication
[666, 1223, 1237, 1449, 1513, 1487, 1542, 1569, 1561, 1587, 1591, 1574, 1735, 1855, 1980, 2119, 1959, 2351, 2686, 2930, 2980, 7164, 2912]

2.3 Division
[201, 229, 215, 313, 339, 429, 1001, 1046, 1287, 1377, 1535, 1612, 1591, 1574, 1735, 1855, 1980, 1959, 2351, 2741, 2686, 2930, 2980, 7164, 2912]

3 Elementary functions, general
[375, 389, 575, 636, 603, 1103, 1242, 1595, 1622, 1721, 1684, 1682, 1759, 1805, 7083, 1910, 2016, 2119, 2063, 2242, 7102, 2524, 2561, 2511, 3297, 2513, 2482, 2661, 2814, 2625, 2776, 2777, 2654, 3330, 3298]

3.1 Elementary functions, CORDIC and related algorithms
[182, 183, 239, 255, 364, 513, 540, 645, 637, 653, 718, 840, 1050, 1066, 1270, 1425, 1664, 1862, 1673, 1776, 1928, 2124, 2345, 2274, 2505, 2531, 2680, 2774, 2973, 2968, 3092, 3032, 3078]

3.2 Elementary functions, function approximation

3.2.1 Polynomial evaluation
[250, 270, 295, 417, 1043, 1205, 2315]
3.3 Square root, general
[1064, 1165, 1453, 1566, 1618, 2529, 2641]

3.3.1 Square root, bit-oriented, iterative, and table methods of computation

3.3.2 Square root, Newton’s method
[151, 271, 293, 365, 338, 334, 374, 442, 418, 503, 508, 522, 585, 574, 568, 570, 688, 1303, 1293, 1371, 1551, 2297, 2982, 2910]

3.4 Sine and Cosine
[172, 1050, 1002, 1007, 1154, 1372, 1514, 1632, 1631, 1730, 1818, 1918, 2085, 2196, 2570, 2924, 2911, 2843, 2943, 3038]

3.5 Logarithm
[147, 262, 322, 676, 982, 1093, 1276, 1500, 2072, 2073, 2571, 2699]

3.6 Exponential function
[134, 400, 1161, 1335, 1489, 1713, 1812, 2434, 2572, 2965]

3.7 Arctangent
[136, 152, 199]

3.8 Other transcendental functions
[489, 601, 153, 1008, 356, 266, 351, 2065, 1136, 2824, 3018]

4 Binary-decimal conversion
[181, 165, 214, 466, 565, 670, 1144, 1268, 1269, 1379, 1620, 1674, 1967, 1940, 2473, 2565, 2489, 2820]
5 BCD arithmetic

[660, 711, 762, 763, 764, 765, 766, 767, 768, 1356, 1464, 1670, 1608, 2002, 2610, 2923]

6 Multiple precision arithmetic

[283, 321, 401, 419, 619, 604, 937, 986, 1081, 1404, 1512, 2769, 2753, 2997, 3187]

7 Conferences on computer arithmetic

[7023, 7033, 7038, 7047, 7050, 7062, 7080, 7081, 7123, 7153, 7161, 7155, 7187]

8 Additional contributions from Nelson H. F. Beebe


Title word cross-reference

#26 [5440].

\((2^n)^m\) [3755]. \((10^{31} - 1)/9\) [1941]. \((2^n)\) [4306, 4327, 4509, 4518, 4424]. \((2^n + 1)\) [1063, 4741, 3867]. \((2^n - 1)\) [4802]. \((2^n - 1, 2^{n+p}, 2^n + 1)\) [6214]. \((2^n)^2\) [6021]. \((2^n \pm 1)\) [5467, 4094]. \((2m)\) [4389]. \((2n + 3)\) [6467]. \((2n - (2p \pm 1))\) [4802]. \((a \cdot x) \cdot x\) [6734]. \((d, r)\) [774]. \((M, p, k)\) [5751]. \((R)\) [2871]. \((p)\) [4306, 4389].
(x + y) * (x - y) [6613]. $-2 \{728, 175, 198, 933, 786\}. \ -\infty < n < +\infty \{134, 152\}. 0 \{5584\}. 0 < N < 1 \{153\}. 0 \div 0 \{685\}. $1 \{3699\}. 1 \{4939, 4299, 5103, 5585, 3654, 2130\}. 1, 000, 000 \{606\}. 1/\sqrt{3} [5722]. 1/t [2139]. 10 \{520, 5952\}. 116 \{3976\}. 128 \{4808\}. 15 \{520\}. 16 \{2468, 4141, 4029\}. 17 \times 9 \{3011\}. 2 \{989, 4257, 2014, 5621, 3192, 3948, 606, 5985, 421, 4299, 4960, 3246, 3421, 1725, 3430, 3104, 3437, 5559, 3452, 520, 312, 3641, 3774, 4405, 3654, 5047, 3324, 4892\}. 2, 576, 980, 370, 000 \{5856\}. 22n + 1 \{2111\}. 256 \{4392\}. 27 \{424\}. 2^n + 1 + 1 \{3925\}. 2^{2n+1} - 1 \{5967\}. 2^q - 1 \{2820\}. 2^k \{4437, 4947, 5447, 4988, 4996\}. 2^k + 1 \{851\}. 2^{k+1} \{4437\}. 2^n \{5410\}. 2^n \{1536, 5967, 3929\}. 2^n + 1 \{3925, 4939, 5665, 4415\}. 2^{n+1} - 1 \{6457\}. 2^{n+k} \{6457\}. 2^n - (2^n - 1) \{5290\}. 2^N - 1 \{2950, 4776, 6457, 4170, 3925\}. 2^n + 1 \{5957\}. 2^n + 1 \{5957\}. 2^n + 1 \{6182\}. 2 \times 2 \{5856\}. 3 \{368, 4941, 4135, 421, 3991, 4159, 3996, 4980, 4825, 312, 6151, 4075, 6541, 4889, 4890\}. 3 - j \{289\}. 32 \{3941, 4392\}. 3 \times 3 \{2457\}. 4 \{3925, 4271, 4613, 2485, 2486, 421, 3391, 5670, 5473, 4337, 4669, 2913, 4029, 4031, 2775, 2964, 1897, 3485, 3490\}. $94.95 \{3666\}. 5 \{5957, 4753\}. 54 \times 54 \{3444\}. 6 - j \{289\}. 64 \times 64 \{2243\}. 8 \{424, 3404, 4029, 3452\}. 84 \{298\}. $85.00 \{4099, 4100\}. 88062 \{520\}. 8k \{6771\}. 8 \times 8 \{5047\}. 9 - j \{289\}. < \{6159\}. > \{6159\}. 0 \{4312\}. 2 \{5683\}. 5 \{2760\}. 5 \{3854\}. 5 \{2760\}. 5 \{3854\}. 5 \{3854\}. $\{1138\}. 10 \{6819\}. 20 \{7309\}. LN \{3868\}. ln(x) \{1500\}. 5 \{1198\}. log(n) \{1205\}. log(z) \{136\}. LU \{6724, 6489\}. M \{4790, 172, 4089, 2590, 2595, 2604, 2681, 5284, 570, 6270\}. M^E \{2740\}. F_2(x) \{6960\}. f_2 \{4186\}. F_{5,m} \{5630\}. F_{27,m} \{5630\}. R^n \{6832\}. Z^2 \{4017, 4987\}. GF(2) \{5258, 1657\}. GF(2)^2 \{6098\}. GF(2)^m \{4194, 3727, 4872\}. GF(2^{m+1}) \{5430, 4626, 4932, 3830, 4481, 5092, 3712, 3847, 3841, 5459, 2859, 2860, 3711, 4812, 5258, 5121, 4668, 4540, 4984, 2392, 5382, 4588, 4959, 4898, 5386, 3161, 4236, 4887, 4725, 2272\}. GF(2^n) \{4946\}. GF(p) \{2046\}. GF(p^m) \{3448\}. GF(p^m) \{4061\}. GF(q^n) \{4649\}. MECIPTI \{273\}. $\mu \{1400, 4818, 4860, 2273\}. \mu P \{1578, 1973\}. N \{3920, 793, 2297, 2298, 152, 153, 172, 4529, 5020, 4878, 5898, 5632, 4116, 5996, 1271, 3583\}. n_{10} \{1138\}. N_0^2 = -N_0^2 \{3414\}. N \geq 32 \{5794\}. n \log(n) \{6406\}. n \times n \{3103\}. O(1) \{6306\}. O(n) \{1173, 3394, 1516\}. O(n^2) \{2741, 2742\}. O(n \log n) \{6454\}. \Omega \{4874\}. Arcosz \{199\}. Arcsinz \{199\}. Arctanz \{199\}. arctan \{199\}. modp \{1880\}. P \{6445, 4590, 2024, 1111, 879, 1027, 1603, 6961, 4230, 4576, 3312\}. p^k \{6621\}. \pi \{1598, 2198, 2199, 4555, 259, 5586, 1658, 450\}. p \times p \{4534, 4678\}. q \{5724\}. qm \times n \{1596\}. QR \{6060\}. R \{3563, 3025, 1573, 1581, 6349, 5794\}. r = m^k \{1412\}. r^n \{4897\}. r^k - 1 \{4897\}. r^k + 1 \{4897\}. \{r^m = 2, r^m - 1, r^n\} \{5249\}. r \geq 8 \{5794\}. s \{4829\}. sin(BIG) \{5184\}. sin^{-1} \{3092\}. sinN \{172\}. sin x \{364\}.
\sqrt{a^2 + b^2} [6222]. \sqrt{x} [1453]. \sqrt{x/d} [3802]. \sqrt{2} [6907]. \sqrt{x} [1283, 442].
\sqrt{x^2 + y^2} [5621]. T [6055]. \tan^{-1} x [364]. \theta (\log N) [2318]. \times [4022, 3872, 4088].
w [4686]. X [1512, 2856]. x^2 + ny^2 [3666]. x^n [5921, 3270]. y [4368]. Z [5281].

-2 [988]. -adic [1111, 1027, 1603, 2024, 879]. -approximations [5202, 5203].

.NET [6359, 5023].

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0.18-CMOS [5718]. 0.4.1rc [6360]. 0.80pJ [6493]. 0.80pJ/flop [6493].
'00 [7262, 7267, 2504]. '01 [7276]. '03 [7305]. '04 [7314, 7322]. '07 [7357, 7363, 7365, 7370]. '08 [7374, 2996, 5329].

1 [209, 3508, 6579, 3375, 2839, 220, 63, 65, 67, 552, 3238, 6611, 4022, 4362, 1142, 5718, 1898, 3822].
1-GHz [6579, 4362, 5718]. 1-Output [5295]. 1.0 [3823]. 1.24Tflop [6493]. 1.24Tflop/sW [6493]. 1.5 [5601]. 10 [5683].
10967-1 [3238]. 10967-2 [4317]. 10967-3 [5109]. 16th [7073, 7406, 7155, 7283, 7296, 27, 7055, 2727].
'11 [7401, 1091, 1365, 1479, 1382, 1288]. 11-bit [4860].
11th [7274, 7168, 7186, 7187, 3147]. 120B [1101]. 128-bit [6261, 4073].
12th [7317, 7383, 7030, 7210, 3416, 7369]. 13 [4276, 2055]. 132-Bit [333].
16-Bit [4486, 6619, 6633, 6971, 6771, 2987, 1237, 1569, 4944, 3040, 1724, 6260, 1449]. 16-bit [1578].
16F/400 [902]. 16th [7346, 7337, 4602, 7031, 7343]. 17 [278, 823]. 17-Bit [634, 633].
1788 [6481]. 1788-2015 [6010]. 17th [7408, 7348, 7264, 7388, 7341].
8 ADDITIONAL CONTRIBUTIONS FROM NELSON H. F. BEEBE


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4.4ns [3444].


8 ADDITIONAL CONTRIBUTIONS FROM NELSON H. F. BEEBE

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algorithm [5041, 4717, 5399, 5400, 4232, 3154, 6390, 645, 2447, 3162, 3324, 4724, 5404, 5055, 5956, 3334, 4894, 6589, 2997, 3511, 2013, 6862, 1170, 2166, 3016, 3017, 3018, 3019, 375, 5988, 1099, 1183, 4949, 5448, 423, 3974, 502, 6334, 553, 2054, 3625, 5992, 261, 2769, 3896, 4395, 5597, 6726].

Algorithmen [2357, 2196, 2531, 1664, 2264].

Algorithmes [4628, 5273, 4297, 2720].

Algorithmic [5761, 7350, 3854, 243, 3617, 2760].

Algorithmics [6950, 4434, 5036].

Algorithmique [5036, 4434].

Algorithms [835, 2002, 6558, 4099, 4100, 707, 1770, 3805, 840, 651, 995, 6785, 7331, 3186, 5332, 5617, 6181, 1242, 3019, 6190, 3820, 4622, 1086, 5754, 2837, 4474, 4475, 4628, 3206, 4476, 5885, 1006, 1007, 1008, 1093, 6813, 5349, 3036, 3964, 4130, 6441, 5092, 2036, 2323, 6705, 6706, 5447, 3038, 458, 3698, 721, 808, 862, 6597, 1488, 5995, 5454, 868, 4147, 5102, 2498, 7375, 4155, 4313, 3565, 4501, 3566, 3845, 1490, 1386, 1492, 3236, 4162, 4659, 4660, 3062, 3063, 5675, 2505, 3064, 6112, 6616, 2357, 2196, 4171, 812, 511, 1394, 3856, 7398, 512, 6261, 3075].

Algorithms [4511, 3252, 4331, 617, 5777, 5265, 2893, 1499, 4018, 3084, 2896, 3258, 7220, 7340, 1032, 6733, 3597, 1607, 1852, 672, 1608, 676, 1609, 4830, 7099, 7113, 4353, 4997, 4536, 3262, 438, 347, 467, 351, 3604, 5001, 4359, 2531, 3748, 6946, 4363, 1297, 3751, 3278, 1414, 3755, 1417, 4206, 1418, 1735, 5943, 2753, 3760, 7170, 5945, 6747, 5884, 5855, 7158, 6862, 4562, 759, 2420, 3463, 5296, 910, 697, 3642, 364, 4069, 1315, 2567, 2776, 2777, 5722, 5806, 2906, 923, 2788, 3786, 1664, 2264, 5508, 3322, 1446, 3330, 5057, 5326, 540, 3172, 1065, 3509, 5411, 5904, 4451, 4916, 4264, 5075, 6074].

algorithms [6179, 6684, 6789, 7121, 2628, 2164, 3186, 1925, 410, 3946, 1792, 1177, 2645, 3024, 3379, 4770, 2170, 1801, 3209, 4635, 6817, 3388, 217, 5094, 5097, 5998, 6331, 7148, 3980, 4655, 5662, 1276, 3232, 5252, 1947, 726, 2881, 4333, 2375, 3080, 4520, 1719, 2386, 3739, 815, 1720, 1847, 1605, 5553, 7254, 7265, 7281, 7294, 7308, 7325, 4023, 2525, 4681, 3095, 2720, 4999, 5133, 2397, 2529, 5135, 5370, 6372, 4034, 5795, 4036, 1416, 1629, 5564, 6138, 2231, 4850, 2416, 4555, 2555, 4046, 3886, 4563, 3130, 3131, 3465, 5298, 2426, 1749, 1988, 5162, 4715, 2963, 1055, 2787, 3155, 482, 1668, 4887, 5324].

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Algorithms [2011, 375, 1971, 1507].

Alignment [5879, 3809, 3873].

alignments
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5127, 15, 6130, 6368]. **Analytics** [6339]. **Analyzed** [6619, 678, 679, 680, 745]. **Analyzer** [304]. **analyzers** [2334]. **Analyzing** [2346, 6746]. **Anatomy** [3454]. **Anchored** [6420, 6249]. **Ancient** [5745, 6416, 588]. **Andrews** [7270]. **Angeles** [6987]. **Angewandte** [7049, 7048]. **Angle** [2345]. **Angles** [4166]. **angular** [82]. **ANL** [430]. **Ann** [7050, 7183]. **Anniversary** [7194]. **Annotated** [5618, 1212]. **Announcements** [3800]. **Annual** [7040, 7189, 7201, 7246, 7357, 7374, 7147, 7006, 7042, 7132, 7317, 7359, 2037, 7049, 7106, 7138, 7162, 7334, 7197, 7229, 7296, 7355, 7371, 7327, 7268, 7016, 7021, 7271, 7058, 7093, 7018, 7046, 7317, 7355, 7371, 7154, 7353]. **Annuities** [4215]. **Anomalies** [1834]. **Anomalous** [39]. **ANOVA** [5573]. **ANR** [6318]. **ANSI** [6432, 1825, 1826, 4041]. **ANSI/IEEE** [6432, 1825, 1826]. **Answer** [1327]. **Anti** [51]. **Anti-Aircraft** [51]. **Anticipation** [4390, 4998]. **Anticipator** [5509, 4633, 2499]. **anticipators** [6028]. **anticipatory** [3754, 3649]. **Antikythera** [5845]. **antilogarithmic** [4589, 5425]. **Antitrust** [5305]. **Anton** [5495]. **Antonio** [7154]. **ANTS** [7350]. **ANTS-VII** [7350]. **Anwendungen** [1940]. **Anwendungsgebiete** [1456]. **anwendungsorientierten** [1213]. **Any** [5635, 6547, 6402, 4459, 4460, 4322]. **Anyway** [6651]. **AOP** [4509, 4812]. **AP** [1101, 7250]. **AP-120B** [1101]. **AP-ASIC** [7250]. **Apache** [5584]. **APL** [685]. **APMathLib** [4436]. **App** [6296]. **Apparatus** [600, 4292, 3958, 6228, 6492, 3809, 3978, 3840, 3981, 3708, 3873, 2083, 3653, 3328]. **Appearance** [3843]. **Apple** [4471, 5279, 1140]. **APPLESOFT** [994, 1067, 1311]. **Applicability** [1673, 6306]. **Application** [5405, 3919, 4252, 6571, 844, 997, 6410, 3518, 7192, 7205, 7391, 6583, 7178, 40, 6587, 3953, 4284, 4771, 7303, 7348, 3537, 499, 3214, 4155, 6461, 552, 3405, 7152, 7321, 7362, 7376, 7385, 1115, 6480, 3729, 4987, 3257, 1608, 4536, 4537, 4542, 2533, 2537, 6374, 1213, 6141, 7297, 3636, 1746, 7269, 5722, 1894, 7230, 4878, 2787, 6652, 7343, 7188, 6910, 2597, 5816, 934, 6175, 4256, 2619, 1245, 6817, 4137, 2333, 2667, 7148, 3231, 3232, 2686, 5858, 1203, 4665, 6236, 5869, 6275, 3279, 5880, 2757, 4044, 2556, 3123, 2562, 5036, 2963, 3652, 6828, 1444, 1445, 4432, 2273]. **Application-Oriented** [1213]. **Application-Specific** [6571, 7391, 7303, 7348, 7321, 7362, 7376, 7297, 7269, 7230, 6652, 7433, 7188, 7337, 7385, 6910, 2597, 6282]. **Applications** [6770, 6889, 4901, 6162, 7177, 7202, 7232, 4251, 4447, 1539, 5819, 7346, 7360, 4605, 5331, 7286, 1683, 939, 1922, 6077, 7302, 6581, 6313, 6795, 3533, 3690, 3956, 4294, 5645, 2649, 6913, 6814, 2173, 3386, 6328, 5988, 6710, 296, 1706, 1813, 6918, 546, 5102, 4309, 4311, 6715, 7235, 1277, 1383, 1585, 7029, 7045, 7126, 7384, 1282, 5113, 6723, 7218, 5256, 4326, 2884, 5119, 1119, 5361, 303, 7111, 6482, 6486, 6846, 6935, 5783, 4551, 1406, 4829, 6255, 6635, 4842, 7199, 2093, 3759, 4377, 5148, 7066, 6378, 1509, 363, 2253, 1522, 6874, 7020, 6552, 4767, 7189, 6886, 1163, 2986]. **Applied** [7190, 7067, 537, 1172, 3523, 6327, 1109, 7349, 4958, 7409, 6994,
1937, 3554, 5464, 2187, 7018, 4661, 2686, 5356, 2193, 2194, 2359, 2360, 2366,
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5009, 2534, 3618, 2700, 2376, 2377, 3859, 2206, 3733, 2384, 4825, 3867, 1725,
2523, 2718, 2719, 2217, 5369, 5560, 5009, 2534, 3618, 2700, 2376, 2377, 3859,
150, 6816, 6441, 3211, 5759, 3966, 1369, 1255, 6705, 6706, 6914, 946, 1181, 12, 1803, 4135, 4136, 6916, 7015, 241, 1702, 5447, 6443, 272, 499, 3389, 3543, 3037, 1256, 660, 5535, 5990, 5536, 1573, 1104, 4299, 4885, 543, 378, 948, 5450, 5451, 808.

**Arithmetic** [3975, 3701, 5918, 865, 6597, 2492, 2664, 2665, 3548, 4489, 4651, 5765, 5350, 6203, 54, 1109, 1017, 1262, 3838, 5453, 1375, 1263, 6705, 6706, 6914, 946, 1181, 12, 1803, 4135, 4136, 6916, 7015, 241, 1702, 5447, 6443, 272, 499, 3389, 3543, 3037, 1256, 660, 5535, 5990, 5536, 1573, 1104, 4299, 4885, 543, 378, 948, 5450, 5451, 808].
3482, 5170, 5402, 5313, 6286, 1524, 5046, 5507, 3788, 4881, 2262, 2263, 2264, 2443, 2444, 6653, 927, 142, 1442, 1666, 4417, 3321, 5174, 5590, 6549, 1156, 1157, 1526, 1446, 1447, 403, 3908, 3657, 2975, 3791, 1058, 4423, 986, 263, 6655, 6879, 4087, 4425, 2802, 987, 4428, 784, 1332, 1671, 933, 1904, 1905, 2132, 3660, 1333, 2811, 4726, 676, 6539, 4578, 3321, 5174, 5590, 6549, 1156, 1157, 1526, 1446, 1447, 403, 3908, 3657, 2975, 3791, 1058, 4423, 986, 263, 6655, 6879. Arithmetic [4087, 4425, 2802, 987, 4428, 784, 1332, 1671, 933, 1904, 1905, 2132, 3660, 1333, 2811, 4726, 676, 6539, 4578, 3321, 5174, 5590, 6549, 1156, 1157, 1526, 1446, 1447, 403, 3908, 3657, 2975, 3791, 1058, 4423, 986, 263, 6655, 6879].


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[5623, 2836, 5916, 5986, 5992, 4646, 735, 736, 878, 4015, 6262, 4365, 5141, 3762, 4218, 4382, 4698, 6512, 475, 1666, 5056, 588, 4626, 3542, 3556, 3857, 4688, 3740, 1861, 4838, 4201, 139, 4697, 4699, 4856, 4857, 5019, 4402, 2447, 4581].


Between [3921, 5831, 5116, 4017, 4987, 7053, 573, 3630, 586, 4743, 5825, 6075, 5080, 4122, 4774, 5219, 5092, 659, 3708, 3716, 3268, 4364, 200, 3764, 5954, 3202].


BiCMOS [3554, 3224]. BID [5042]. BIDEC [148]. Biennial [7057, 7073].

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Binary-Coded [6422, 5631, 1926, 6324, 5846, 5233, 217, 5452, 1268, 1269, 3053, 1276, 1828, 4319, 3242, 3575, 2878, 2690, 2881, 2514, 2376, 1206, 5781, 1, 4185, 1402, 1722, 226, 392, 3090, 4534, 4678, 680, 817, 3869, 5560, 1209, 6373, 2743, 3627, 6139, 4856, 1643, 5888, 2556, 1981, 5721, 2426, 6808, 1434, 1892, 3653, 5589, 5725, 6544, 3316, 3317, 2794, 3328, 5321, 5324, 785, 4588, 4728, 4729, 6769].

Binary-Coded-Decimal [5114, 1124].

Binary-Decimal [2489].

Binary-Integer [5042].

binary-residue [3869, 3316, 3317].

Binary-Ternary [5405, 5599, 6071].

Binary-to-Decimal [2820, 5907, 148, 216, 1379, 252].

Binary-to-Multidigit [5008].

Binary/Decimal [6289].

Binary128 [5667, 5769, 6120, 6242], binary64 [6923, 5825, 6120, 6242, 6133].

BinFPE [6828].

Biography [4226, 5582].

Biologically [5899].

Biophysically [5381].

Biopolitics [6768].

Biot [6963].

Bipartite [4907, 5358, 3461, 3768, 4053].

Bipolar [2904].

Biquad [1843].

Biquinary [795].

Biresidue [571].

Birmingham [7166, 7095].

Birthday [7135].

bis [61].

Bisection [3205, 6487, 3656, 3204, 3379].

bisection-like [3379].

BIST [4719].

BIT [209, 220, 3674, 3011, 5623, 4927, 1173, 5430, 3941, 4932, 2838, 1567, 5986, 4486, 1576, 6446, 4306, 5459, 2859, 5244, 6922, 3235, 333, 5107, 2056, 4509, 6619, 2064, 2374, 4518, 5691, 4340, 6118, 4988, 558, 4538, 2396, 4542, 3872, 680, 817, 3869, 5560, 1209, 6373, 2743, 3627, 6139, 4856, 1643, 5888, 2556, 1981, 5721, 2426, 6808, 1434, 1892, 3653, 5589, 5725, 6544, 3316, 3317, 2794, 3328, 5321, 5324, 785, 4588, 4728, 4729, 6769].

bit [2328, 4788, 3040, 3976, 4650, 3547, 1377, 1578, 3392, 298, 4493, 4956, 4652, 5103, 2675, 6717, 3406, 6924, 1591, 2363, 2364, 2509, 3857, 2368, 2698, 2370, 2371, 2372, 2373, 2203, 2514, 2887, 4668, 5124, 5125, 4984, 2385, 5871, 6493, 1724, 2520, 2521, 1961, 4534, 4678, 1612, 6941, 2395, 5789, 6260, 6261, 6840, 2220, 2732, 3272, 2224, 6846, 2533, 5287, 1416, 4208, 3286, 1872, 633, 5381, 3626, 4857, 4860, 4861, 2429, 4400, 4073, 3151, 1893, 2907, 4078, 4876, 3907, 2448, 6391, 1449, 1998, 1232, 1669, 2798, 3165, 3910, 3911, 5898, 2272, 1907].

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8 ADDITIONAL CONTRIBUTIONS FROM NELSON H. F. BEEBE

8 ADDITIONAL CONTRIBUTIONS FROM NELSON H. F. BEEBE

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2599, 7160, 3667, 3801, 5189, 5409, 5602, 5741, 3508, 1336, 317, 7092, 7123, 129, 166, 4483, 457, 272, 499, 420, 1012, 328, 948, 1106, 7059, 5451, 1486, 2492, 2664, 2665, 3548, 4489, 4651, 5765, 62, 661, 544, 1109, 4652, 380.


Computer [7420, 580, 7027, 924, 1056, 1151, 2121, 7144, 1323, 7328, 2975, 6058, 93, 144, 1527, 5811, 5812, 6392, 483, 590, 1764, 3171, 6910, 540, 1326, 1441, 7358, 94, 3497, 287, 593, 1071, 1167, 2066, 594, 536, 4457, 999, 6184, 939, 471, 7332, 943, 1479, 1565, 1695, 1368, 4298, 1013, 1804, 273, 2322, 724, 2378, 3714, 506, 2190, 3574, 2508, 250, 275, 1029, 7280, 3739, 4824, 5697, 344, 564, 681, 2527, 4356, 5369, 2917, 139, 175, 198, 2543, 1505, 976, 756, 695, 2762, 5582, 6645, 1653, 7223, 2773, 2959, 2960, 4870, 919, 1313, 446, 140, 2778, 2580, 2585, 1529, 782.

computer [3337, 990, 991, 5750, 487, 3549, 2045, 7156, 1508, 984, 917, 4099, 4100, 4619, 1637].

Computing [7027, 7276, 7323, 7223].


Computers [690, 754, 974, 1212, 7055, 1886, 4229, 78, 3203, 1977].

Computers [4017, 1612].

Computing [7021, 7231, 7344, 7357, 7374, 7379, 6291, 73, 4732, 210, 7067, 3667, 6399, 6667, 7317, 7092, 45, 7161, 7203, 4450, 6299, 1462, 3675, 6411, 6413, 5969, 100, 1468, 6794, 7332, 5832, 6429, 1791, 6804, 7248, 7382, 4284, 4291, 7304, 3030, 6325, 7193, 2035, 5647, 1805, 5450, 5766, 106, 3702, 2335, 5851, 6000, 330, 331, 332, 6334, 3561, 6713, 6104, 507, 7195, 7262, 7363, 7424, 4159, 7403, 3239,
ADDITIONAL CONTRIBUTIONS FROM NELSON H. F. BEEBE

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Design [1194, 7124, 7009, 7087, 7108, 7127, 7139, 7149, 7164, 7180, 7207, 7217, 7238, 7276, 7277, 7278, 7289, 7318, 6325, 6913, 2483, 3033, 2173, 4782, 6816, 3696, 1369, 1571, 1104, 5648, 5649, 5848, 3699, 3040, 5993, 3976, 865, 3391, 4141, 1810, 6204, 1375, 1263, 867, 380, 4798, 425, 5657, 1267, 459, 3713, 3986, 6457, 1942, 4504, 5665, 5666, 4964, 5250, 5667, 5769, 506].

Designed [6395, 1929, 1833, 5931].

Designs [5349, 5536, 4484, 4793, 5856, 6349, 5373, 1511].

Determinability [5771, 760, 4719, 6920, 6764]. deterministic-stochastic [6764].

Determination [503, 1604, 3446, 1740, 577, 3930, 5671].

Determine [2996, 5329, 2166].

Determining [1036, 691, 757, 776, 3708, 1403, 2214].

Determinism [5334, 6187].

Deterministic [5771, 760, 4719, 6920, 6764].

Desire [1498].

Desk [711, 115].

Desk-Calculator [115].

Desynchronizel [5730].

Detect [5220].

Detectable [2116].

Detecting [1339, 188, 4792, 6482, 6157, 6662, 6582, 5158, 2446].

Detection [5186, 6404, 5820, 6068, 486, 841, 790, 6407, 6785, 5414, 795, 3383, 6096, 3215, 4303, 5660, 1392, 1599, 1836, 6828, 885, 278, 6932, 279, 5873, 5278, 2091, 2929, 1630, 5882, 4379, 3761, 2103, 4390, 4223, 2567, 1148, 6152, 1663, 6286, 927, 928, 5821, 5822, 2154, 1089, 1090, 5846, 1254, 1182, 5096, 2674, 5104, 3231, 248, 5866, 1719, 2387, 2709, 6138, 5029, 2962, 2807].

Detect [5677, 4593, 5678].

Determinant [3953, 2831].

Determinants [3671, 3828, 5856, 6349, 5373, 1511].

Determine [2996, 5329, 2166].

Determining [1036, 691, 757, 776, 3708, 1403, 2214].

Development [7034, 7189, 3512, 3188, 5525, 7068, 1087, 2030, 2714, 3090, 2216, 2102, 5574, 3125, 5727, 6549, 3489, 1676, 2462, 1783,
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Developments

Deviates

Device

Dezimalrechner

DFE

DFT

DFU

Dhahran

Diagnostic

Diagnostics

Differential

Differentiation

differently

Difficult

Difficulty

Digital

Digital-Filter

digital-signal
[220]. Digital-to-analog [162]. Digits [2996, 5329, 538, 795, 1172, 3020, 95, 1570, 1800, 947, 950, 1016, 1109, 4976, 3587, 5878, 228, 4552, 520, 4049, 829, 832, 3485, 3660, 2994, 3179, 3501, 3502, 3503, 3504, 3505, 3506. 88, 130, 3840, 131, 3716, 2198, 2199, 8, 2928, 4560, 5586, 1523, 2446, 4723).


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4147, 6003, 5663, 3711, 4312, 3713, 3986, 4157, 4963, 4660, 3993, 3407, 3408, 725, 6221, 334, 5469, 5855, 3999, 3411, 4002, 3722, 3723, 6474, 248, 4510, 734, 5360.

Division [5545, 5687, 4975, 4331, 276, 339, 556, 557, 618, 1603, 304, 3420, 4669, 5263, 5476, 25, 278, 1287, 1845, 1031, 121, 1719, 2070, 2896, 5784, 6936, 3986, 6221, 334, 5469, 5855, 3999, 3411, 4002, 3722, 3723, 6474, 248, 4510, 734, 5360]. Division [5545, 5687, 4975, 4331, 276, 339, 556, 557, 618, 1603, 304, 3420, 4669, 5263, 5476, 25, 278, 1287, 1845, 1031, 121, 1719, 2070, 2896, 5784, 6936, 3986, 6221, 334, 5469, 5855, 3999, 3411, 4002, 3722, 3723, 6474, 248, 4510, 734, 5360].

Division [4405, 6756, 159, 206, 923, 1152, 2120, 480, 582, 6153, 6283, 2439, 6156, 2969, 3789, 5809, 985, 532, 235, 2267, 6059, 2978, 2979, 2980, 6550, 5182, 5756, 3795, 649, 2597, 3802, 934, 451, 3510, 1069, 4748, 6903, 3362, 2468, 5079, 3192, 3367, 4114, 2633, 2471, 3528, 932, 4662, 4970, 3689, 5840, 3247, 2882, 3859, 391, 4012, 3081, 4016, 4528, 5365, 5553, 2900, 2074, 2520]. division [3089, 3742, 4534, 4678, 4680, 4681, 2718, 2719, 3095, 566, 1855, 5558, 6840, 2724, 2913, 3104, 3265, 3266, 3437, 4358, 3871, 5936, 5875, 2083, 2919, 443, 4031, 3441, 3615, 4034, 4844, 4690, 2930, 4851, 4381, 4800, 123, 155, 3885, 3886, 1046, 764, 3299, 3133, 3134, 3465, 4866, 6645, 3475, 3774, 2431, 2432, 1959, 253, 1735, 1449].


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**F** [5420]. **F00F** [3819]. **F77** [3431]. **F90** [3431]. **Face** [6845]. **Face-off** [6845]. **Facilities** [4125, 811]. **Facility** [2067]. **fact** [3648]. **Factor** [5186, 1787, 2774, 1941, 2707, 1411]. **Factor-2** [5186]. **Factorial** [2861]. **Factorial-Base** [2861]. **factorising** [592]. **Factorization** [6489, 5881, 5942, 2786, 6060, 4656, 3293, 4709, 5733]. **Factors** [6891, 2035, 6030, 2174]. **factor** [3554]. **fading** [4189, 4584]. **Fail** [6425]. **Failure** [3500, 1493, 3735, 2827, 3589, 3088]. **Fairchild** [393]. **Fairmont** [7322]. **Faithful** [4251, 4456, 5264, 4378, 5388, 5389, 3461, 3765, 4248]. **Faithfully** [5915, 5996, 6006, 6622, 6054]. **Fall** [6998, 7008]. **fallback** [6947]. **Falls** [7304]. **Family** [2455, 4741, 1546, 1547, 2618, 5338, 5341, 1798, 5651, 5653, 4802, 3059, 3234, 4007, 4329, 1610, 3259, 4222, 3773, 5314, 4430, 2460, 5337, 5922, 7097, 2522, 2905, 3309, 3326]. **famous** [6645]. **Fan** [2097]. **Fan-In** [2097]. **Fans** [6755].

**FAQ** [4915, 6798, 6799, 6800, 6801, 6802, 6803]. **FasMath** [2476]. **Fast** [4437, 6557, 6771, 3493, 4241, 4597, 5739, 368, 211, 3805, 5192, 6069, 2144, 6896, 3004, 3005, 5613, 3186, 3809, 2013, 6684, 1682, 6182, 2015, 937, 6574, 5625, 1551, 2297, 2298, 4274, 5427, 1357, 1555, 6583, 6584, 6585, 1002, 3945, 6431, 1562, 1793, 3022, 3199, 2642, 5436, 3201, 5343, 5833, 4474, 4475, 4771, 5838, 3380, 3957, 1796, 6324, 3032, 6912, 2484, 4946, 3385, 4134, 805, 3970, 5992, 1574, 3699, 1807, 1488, 1812, 1580, 545, 2042, 5461, 3842, 5242, 3562, 3712, 5538, 4802, 3564, 3566, 2677, 1276, 6462, 3405, 3232, 3989, 6349, 6219, 3408, 6107, 300, 5859, 4173]. **Fast** [4326, 2511, 2694, 1395, 3251, 3727, 1603, 3859, 5777, 6625, 1845, 5271, 5478, 1031, 5128, 1850, 2073, 4994, 3098, 4682, 2530, 6130, 6368, 5703, 6947, 6036, 6037, 6637, 5137, 5286, 1131, 903, 3613, 4367, 4543, 4686, 5795, 2741, 2742, 3755, 4036, 6507, 5290, 5016, 3760, 2756, 4554, 4855, 4382, 4797, 1642, 2104, 5390, 543, 5570, 4050, 1512, 1144, 4864, 2423, 4393, 6386, 6518, 3137, 2424, 2426, 2564, 2567, 4072, 1657, 2118, 1054, 5952, 6388, 3316, 3317, 6289, 6761, 6875, 834, 315, 2801, 2980, 3329, 3330, 3487, 5176, 2130, 5321, 5322, 5955, 2803, 5898, 4430, 5181, 5182, 2814, 4764, 5217]. **Fast** [4235, 4882, 6290, 787, 2987, 2460, 936, 5749, 1468, 6306, 2020, 6693, 3378, 4773, 2844, 3028, 3828, 3958, 4481, 3969, 4789, 4648, 2180, 1704, 5454, 1936, 6332,
Filters [1461, 3351, 3352, 3359, 6792, 4769, 727, 5861, 885, 6955, 6535, 6287, 6653, 1061, 1162, 1533, 2275, 1912, 1460, 6896, 3003, 1775, 3677, 2291, 3811, 3189, 2161, 4111, 4754, 1246, 4123, 1253, 4290, 2311, 3536, 1254, 659, 720, 3837, 1191, 1939, 4504, 1022, 1493, 1833, 2353, 1949, 3244, 3245, 464, 729, 3246, 2365, 2204, 3108, 569, 6136, 4044, 1506, 1874, 1974, 2415, 2550, 2759, 2939, 824, 2941, 1882, 5890, 1049, 5030, 2252, 4228, 1752, 3785, 1761, 1903, 2588, 2453, 2810, 3202].


[5397]. flagged [4924]. flags [5158]. Flap [5497]. flash [5143]. Flaw
[3372, 3455, 3345, 3302]. FLECKmarks [5352]. flerformat [1704]. Flex
[2026]. Flex/32 [2026]. FlexBlock [6951]. flexibility [3159]. Flexible [5448,
6445, 6708, 6709, 5764, 6220, 4513, 1850, 6951, 683, 4707, 2796, 6659, 4480].
flexiblen [1850]. Flexxkomma [6375]. Fließkomma [2262, 2263, 2264, 2443,
2444, 1448]. Fließkomma-Arithmetik [2262, 2263, 2264, 2443, 2444, 1448].
Fließkommapakets [2263]. Flight [3735, 3589]. flip [5871]. Float
[2077, 2444, 1448]. Fließkomma-Arithmetik
[1850]. flexiblen
[6445, 6708, 6709, 5764, 6220, 4513, 1850, 6951, 683, 4707, 2796, 6659, 4480].
flexiblen
[2026]. Flex/32
[2026]. FlexBlock [6951]. flexibility
[3159]. Flexible
[5448, 6445, 6708, 6709, 5764, 6220, 4513, 1850, 6951, 683, 4707, 2796, 6659, 4480].
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[5774, 3728, 735, 736, 878, 1028, 5863, 3254, 6482, 6483, 6828, 6829, 6234, 6116, 6239, 6023, 4983, 2706, 6118, 4821, 4986, 6119, 2388, 2407, 2408, 6371, 6506, 663, 900, 5011, 5137, 5286, 2738, 4035]. Floating-Point

[3614, 3616, 3752, 2925, 5879, 2741, 2742, 5372, 6954, 1968, 630, 1299, 2537, 2227, 6639, 5942, 6957, 687, 4213, 5943, 2749, 2750, 3116, 6511, 5491, 5500, 5656, 5379, 5380, 6377, 2237, 2238, 1215, 3629, 6140, 2239, 977, 3122, 2240, 4559, 2241, 2761, 5021, 5388, 5389, 5569, 5886, 6642, 6382, 1646, 6274, 3889, 1513, 4051, 1428, 1740, 4863, 5025, 5296, 4393, 4706, 5026, 5717, 5028, 2946, 6967, 5579, 5802, 3640, 2425, 204, 2947, 2769, 2953, 3142, 3143, 3305, 3645, 3646, 2251, 5891, 6150, 6867, 6051, 6052, 6523, 1985, 2958, 2565, 4868, 1432, 1433, 1750, 5497, 5039, 1314, 5805, 1751, 5499, 2434]. Floating-Point

[2571, 2572, 2965, 1439, 5500, 6649, 1754, 3478, 4875, 6054, 4078, 581, 3310, 6280, 5951, 6974, 5310, 1992, 833, 5501, 2786, 3479, 2788, 6651, 3313, 6281, 5807, 3788, 3157, 6156, 6389, 2263, 207, 1442, 1666, 2581, 5051, 5174, 5318, 5319, 5509, 5510, 5593, 1328, 1998, 2975, 208, 3164, 2266, 6158, 5177, 2589, 784, 2983, 1671, 5325, 4093, 6765, 6766, 6551, 5058, 5513, 5597, 5059, 5326, 5183, 6553, 5642, 5834, 4578, 6284, 4444, 6888, 4439, 2135, 2136, 407, 3178, 1912, 4253, 6411, 2290, 6900, 6901, 1546, 1547, 1683, 5203, 6417, 4750, 4923, 2467, 6307, 2630, 2631, 2632, 5908, 5974]. Floating-point

[1766, 1767, 6067, 4102, 2825, 3001, 5519, 5821, 5822, 2283, 6896, 2607, 2284, 6529, 5193, 5194, 2147, 2027, 5748, 5464, 1275, 3848, 6924, 4164, 4163, 3996, 3246, 249, 2883, 4514, 880, 6016, 6233, 4519, 4819, 6622, 2381, 6729, 6362, 1724, 3600, 963, 3091, 6838, 6255, 2218, 3872, 2082, 2534, 5565, 1972, 1973, 6142, 3888, 4225, 4867, 2112, 2427, 2255, 1990, 4228, 6151, 3785, 5311, 3154, 2790, 1057, 3655, 1324, 6388, 1444, 1445, 1446, 1447, 5897, 6656, 5529, 1902, 2137, 3338, 2815, 3914, 1533, 6160, 5407, 6063, 705, 1457, 2598, 2993, 3343, 3344, 3345, 4443, 6295, 6402, 2457, 1067, 5605, 1765, 227]. floating-point

[2166, 1766, 1767, 6067, 4102, 2825, 3001, 5519, 5821, 5822, 2283, 6896, 2607, 2284, 4529, 5193, 5194, 2147, 2027, 5748, 4740, 5074, 2289, 2151, 2610, 3009, 1778, 4264, 4743, 4744, 5075, 5906, 6179, 3677, 2152, 5200, 5521, 4267, 999, 4748, 5355, 5522, 6903, 2153, 1000, 1171, 6304, 5752, 6576, 3189, 4924, 2155, 6421, 1351, 3364, 4925, 1553, 6308, 4928, 2021, 2629, 3815, 4464, 3937, 3940, 1557, 5431, 5636, 6080, 1926, 3946, 4625, 5434, 2306, 2833, 2834, 2835, 3952, 6197, 5344, 5345, 2645, 6318, 5643, 3023, 4477, 3955, 3025, 240, 4774, 5088, 5218, 4292, 945, 4880, 5090, 4938, 2312]. floating-point
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Fold Fonctionnelle Fonctions Forces Forcing Forensic Foreword

Formal Formalisation Formalization Formally Formally-Proved Formally-Verified Formats Format formler formelles

Formulas Formulated Formulation Formulations Forslag Forsythe Fort

forthcoming FORTRAN FORTRAN/77

Fortran-90 FORTRAN/77 Furth Foundations foundation

Four Four-Quadrant Fourier Fourth Fourth ANR FP-ANR FP-Arithmetic GP

FPGA FPC FPChecker fp16 found
Frequency-hopped
2521, 2720, 5132, 1968, 687, 973, 1138, 5036, 17, 4434, 4435, 5062
4264, 4266, 4457, 4744, 5750, 6184, 3369, 29, 40, 4628, 5354, 5362, 4183, 4820, 1,

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1188, 636, 1326]. Gene [4928, 4941, 4992]. Gene/L [4928, 4941, 4992].

General [287, 5520, 1076, 4931, 5976, 6798, 857, 858, 1009, 5650, 5244, 7195, 734, 1870, 4382, 6054, 1440, 2441, 1326, 592, 2460, 291, 2633, 5243, 4827, 2393, 2394, 2220, 4697, 4238, 2273, 2646, 4882, 1188]. General-Purpose [5244, 7195, 6054, 2460, 2393, 2273].

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Properties [709, 4459, 4460, 4745, 2465, 808, 672, 3607, 4370, 2232, 2936, 688, 1875, 2138, 804, 1388, 1389, 2191, 4815, 4977, 626, 3470, 2453].

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Publication [1946, 2504]. Publications [5611, 24].

Public [3805, 4276, 6341, 4326, 4510, 3755, 5801, 4137, 4036, 2934].

Punkte [2016]. punto [4544].

Public-Key [3805, 6341, 4326, 4510, 3755, 5801, 4137, 4036].

Public-Key [3805, 6341, 4326, 4510, 3755, 5801, 4137, 4036].

Publicity [3345]. Published [23]. Publisher [3159]. Publisher's [6169]. Pulse [683, 1765].

Punke [2016]. punto [4544].

Public [3805, 4276, 6341, 4326, 4510, 3755, 5801, 4137, 4036].

Public [3805, 4276, 6341, 4326, 4510, 3755, 5801, 4137, 4036].

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Publishing [23]. Publisher [3159]. Publisher's [6169]. Pulse [683, 1765].

Public-Key [3805, 6341, 4326, 4510, 3755, 5801, 4137, 4036].

Publication [1946, 2504]. Publications [5611, 24].


Pseudoinverse [698]. Pseudorandom [2806, 4437, 834]. pseudorandom-number [4437].

PSI [1336]. psudo [1979].

Public-key [3805, 4276, 6341, 4326, 4510, 3755, 5801, 4137, 4036, 2934].

Pulse [683, 1765].

Punkte [2016]. punto [4544].

Pulse [683, 1765].

Public Key [3805, 6341, 4326, 4510, 3755, 5801, 4137, 4036].

Public [3805, 4276, 6341, 4326, 4510, 3755, 5801, 4137, 4036].

Public [3805, 4276, 6341, 4326, 4510, 3755, 5801, 4137, 4036].

Publication [1946, 2504]. Publications [5611, 24].

Publicity [3345]. Published [23]. Publisher [3159]. Publisher's [6169]. Pulse [683, 1765].

Punke [2016]. punto [4544].

Public-System [1946, 2504]. Publications [5611, 24].


Pseudoinverse [698]. Pseudorandom [2806, 4437, 834]. pseudorandom-number [4437].

PSI [1336]. psudo [1979].

Public-key [3805, 4276, 6341, 4326, 4510, 3755, 5801, 4137, 4036, 2934].

Pulse [683, 1765].

Punkte [2016]. punto [4544].

Pulse [683, 1765].
Quadruple-precision
Qualifying
Quality-Efficient
Quantitative
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Quantized
Quantum
Quartic
Quartus
Quasi
Quasi-Pipelined
Quasi-Serial
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Quaternary
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Qubit
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2886, 6352, 2888, 2380, 3733, 3863, 4020, 4184, 5127, 1719, 2709, 2900, 4189,
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[6072, 5467, 6467, 6021, 177]. Resilience [6430]. Resilient [6710, 6886].
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[5119, 4916]. RNC [7345]. RNC3 [7233]. RNC5 [7300]. RNC’6 [7312].
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[412, 273]. Romberg [887, 6589]. Romberg-Like [887]. Rooms [3416]. Root
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[3874, 568, 3445, 1502, 5142, 1971, 570, 4551, 5376, 5378, 3452, 1635, 6640, 1507,
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[2055, 3068, 3247, 3859, 2890, 4012, 4669, 3081, 4016, 3421, 3588, 3736, 3737,
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3104, 3437, 6130, 6368, 227, 5370, 4031, 4034, 4844, 1303, 1970, 4848, 3453,
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Root-Finding [1799]. Rooting [1165, 1551, 1096, 1185, 2498, 114, 1852, 350,
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Rotation/Vectoring

Rotations

Rotator

Rotten

Round

Round-Off

Round-Off-Errors

Round-to-Nearest

Round-to-Nearest-Ties-to-Even

Round-to-Nearest-Ties-to-Zero

Round-To-Odd

Round-up

Rounded

Rounder

Rounding

Roundoff

Roundoff-Errors

Roundoff-Exact

Roundoff-Off

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881, 4670, 431, 252, 2958, 1051, 6286, 1161, 4244, 3973, 3977, 4954, 5246, 5247, 3580, 2370, 2372, 3089, 6145, 4584, 4585, 3335, 4777, 3854, 2760, 4086.[
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420, 5450, 868, 171, 2046, 888, 4032, 3635, 4063, 1059, 45, 1780, 3700, 4647, 550, 1832, 2700, 2207, 5280, 5487, 3759, 5884, 5885, 4711, 930, 5178, 4433, 4727, 888, 6489, 4032, 3635, 4063, 1059, 45, 1780, 3700, 4647, 550, 1832, 2700, 2207, 5280, 5487, 3759, 5884, 5885, 4711, 930, 5178, 4433, 4727.

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Sprachbeschreibung

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6390, 4722, 2978, 2979, 2981, 2982, 5733, 4432, 4894, 4240, 6769, 2011, 1400].


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Squarers [4927, 125, 4419, 4884, 5050, 4085, 3235]. Squares [591, 1794, 2668, 4808, 4816, 671, 628, 1642, 4703, 2138, 1912, 282, 1988].

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2784, 3784, 1153, 701, 779, 1996, 3318, 5317, 4420, 5727, 2796, 3166, 3167, 3331, 3332, 4089, 4090, 4091, 4426, 4427, 4584, 4585, 4586, 2803, 2804, 2590, 4891, 785, 2984, 6769, 471, 1910, 1082, 408, 409, 2833, 374, 382, 383, 2499, 462.

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Supported by the Open Library of Unesco. Szabo [499].

Szeged [7248].
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[3582]. Treatment [1257, 197, 5000, 5293]. Tree [5353, 4378, 3224, 1892].
Trees [4739, 6815, 2893, 3494, 5339, 5478, 4255, 2916].
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intrepid pre-SIGPLAN 90 conference implementation of what is stated in the paper revealed 3 mistakes:

1. Table 5 (page 124):
   insert k <-- 0 after assertion, and also delete k <-- 0 from Table 6.

2. Table 9 (page 125):
   for -1:USER!(""),
   substitute -1:USER!("0");
   and delete the comment.

3. Table 10 (page 125):
   for fill(-k, "0")
   substitute fill(-k-1, "0")

---


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Bartholomew-Biggs:1991:AST


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Umemura:1991:FNL

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- fuzzy logic.

Actual applications described in the book include:

- economic input-output models,
- quality control in manufacturing design,
- a computer-assisted proof in quantum mechanics,
- medical expert systems,
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A realistic view of interval computations is taken: the articles indicate when and how overestimation and other challenges can be overcome. An introductory chapter explains the content of the papers in terminology accessible to mathematically literate graduate students. The style of the individual, refereed contributions has been made uniform and understandable, and there is an extensive book-wide index. Audience: Valuable to students and researchers interested in automatic result verification. Detailed information, including contents, contributors, and an order form can be found:

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Industry immediately started to investigate the failure.” From the report: “The internal SRI software exception was caused during execution of a data conversion from 64-bit floating point to 16-bit signed integer value. The floating point number which was converted had a value greater than what could be represented by a 16-bit signed integer. This resulted in an Operand Error. The data conversion instructions (in Ada code) were not protected from causing an Operand Error, although other conversions of comparable variables in the same place in the code were protected.”

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The main aim is to produce a usably efficient implementation, which can be easily interfaced with existing C++ code. This contrasts with previous implementations in functional languages (Haskell, Miranda etc.), which, although theoretically important, seem to be rather too slow for real use.

This code is designed as an add-on to Victor Shoup’s arbitrary-precision arithmetic package NTL, and implements a new type XR, to complement NTL’s ZZ and RR integer and real types.

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- hardware and software systems for interval computations, and
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• economic input-output models,
• quality control in manufacturing design,
• a computer-assisted proof in quantum mechanics,
• medical expert systems,
• and others.

A realistic view of interval computations is taken: the articles indicate when and how overestimation and other challenges can be overcome. An introductory chapter explains the content of the papers in terminology accessible to mathematically literate graduate students. The style of the individual, refereed contributions has been made uniform and understandable, and there is an extensive book-wide index. Audience: Valuable to students and researchers interested in automatic result verification. Detailed information, including contents, contributors, and an order form can be found:

• on Kluwer homepage http://www.wkap.nl, or

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