A Bibliography of Publications on Floating-Point Arithmetic

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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`),
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- 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 BibTe

Books, hardware oriented

[1723, 282, 1288, 1218, 3120, 3326, 1918, 843, 1166, 1002, 1459, 845, 1345, 7381, 7382, 1559]

Books, software oriented or theory

[1275, 468, 471, 472, 119, 1422, 2400, 910, 1051, 353, 2961, 2441, 2978, 2277, 321, 529, 7235]

Books, machine specific

[2180, 3226, 3122, 2443, 1769, 1905, 2296, 1937, 2478]

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

1 Choice of base, floating point formats

[500, 752, 754, 732, 729, 895, 1143, 1133, 2038, 2274, 2398, 2551, 2779, 2793]

1.1 Precision and Rounding

[434, 560, 747, 849, 883, 898, 966, 1034, 1043, 1047, 1196, 1298, 1437, 1378, 1540, 1731, 2287, 2463, 2536, 2850, 3167, 3291]

1.2 Determination of parameters of floating point arithmetic

[688, 825, 1638, 2280, 2206]

1.3 IEEE standards for floating point arithmetic

[995, 1199, 1225, 1208, 1236, 1198, 1205, 1342, 1328, 1329, 1282, 1302, 1460, 1387, 1411, 1389, 1727, 1826, 1864, 1865, 1862, 2090, 2177, 2346, 2580, 3062]

1.4 Floating point arithmetic, general and implementation issues

[635, 721, 1016, 1037, 1085, 1097, 1096, 1238, 1240, 1212, 1276, 1268, 1477, 1495, 1994, 2014, 2222, 2223, 2379, 2453, 2356, 2535, 2780, 2781, 2709, 2778, 3020]

1.5 Floating point packages

[1289, 1702, 1681, 1775, 1733, 1886, 1851, 1887, 1969, 2083, 2106, 2209, 2305, 2306, 2307, 2486, 2487, 1354]

1.6 Floating point units

[417, 1155, 1322, 1280, 1332, 1356, 1325, 1351, 1272, 1317, 1326, 1500, 1542, 1499, 1535, 1558, 1664, 1578, 1580, 1581, 1682, 1612, 1609, 1617, 1644, 1718, 1620, 1791, 1778, 1718, 1759, 1788, 1720, 1799, 2010, 1972, 2000, 1966, 2019, 1958, 1951, 1952, 2133, 2085, 2158, 2252, 2281, 2314, 2257, 2283, 2258, 2189, 2218, 2327, 2269, 2219, 2294, 2468, 2414, 2415, 2439, 2329, 2450, 2412, 2409, 2321, 2431, 2470, 2370, 2330, 2451, 2335, 2571, 2506, 2526, 2566, 2521, 2498, 2569, 2552, 2543, 2667, 2776, 2739, 2966, 2879, 2949, 3106, 3056, 3197, 3358]

1.7 Test of floating point routines

[502, 1456, 1728, 1872, 1871, 2022, 2023, 1967, 2110, 2476, 2604, 2612, 2681, 2680, 2796, 2775, 2761, 3061]

2 Addition and Subtraction

[376, 1515]

2.1 Floating-point Summation

[326, 346, 363, 362, 572, 641, 679, 833, 1663, 2282, 2359]

2.2 Multiplication

[682, 1248, 1262, 1478, 1545, 1518, 1576, 1603, 1595, 1621, 1678, 1593, 1760]

2.3 Division

[209, 238, 223, 323, 349, 439, 1019, 1066, 1313, 1405, 1569, 1647, 1625, 1608, 1772, 1892, 2017, 1996, 2394, 2785, 2730, 2976, 3025, 7403, 2958]

3 Elementary functions, general

[385, 399, 588, 652, 617, 1124, 1267, 1629, 1658, 1758, 1721, 1719, 1796, 1842, 7322, 1947, 2054, 2159, 2102, 2284, 7341, 2567, 2604, 2554, 3345, 2556, 2525, 2705, 2858, 2669, 2820, 2821, 2698, 3378, 3346]

3.1 Elementary functions, CORDIC and related algorithms

[190, 191, 248, 264, 374, 525, 553, 661, 653, 669, 735, 857, 1070, 1086, 1295, 1453, 1701, 1899, 1710, 1813, 1965, 2164, 2388, 2317, 2548, 2574, 2724, 2818, 3019, 3014, 3137, 3077, 3123]

3.2 Elementary functions, function approximation

[240, 241, 483, 625, 770, 769, 985, 1023, 1164, 2002, 2055, 2617, 2693, 2791, 2792]

3.2.1 Polynomial evaluation

[259, 280, 305, 427, 1063, 1230, 2358]

3.3 Square root, general

[1084, 1189, 1483, 1600, 1653, 2572, 2685]

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

[120, 153, 360, 1024, 1010, 1153, 1355, 1446, 1408, 1374, 1428, 1539, 1827, 1924, 1836, 1889, 1973, 1954, 2037, 1957, 2008, 2049, 2092, 2144, 2184, 2260, 2397, 2584, 2541, 2717, 3047]

3.3.2 Square root, Newton's method

[158, 281, 303, 375, 348, 344, 384, 452, 428, 515, 520, 534, 598, 587, 581, 583, 704, 1330, 1319, 1399, 1585, 2340, 3027, 2956]

3.4 Sine and Cosine

[180, 1070, 1020, 1025, 1178, 1400, 1546, 1668, 1667, 1767, 1855, 1955, 2125, 2236, 2613, 2970, 2967, 2889, 2989, 3083]

3.5 Logarithm

[154, 271, 332, 692, 1000, 1114, 1301, 1531, 2111, 2112, 2614, 2743]

3.6 Exponential function

[141, 410, 1185, 1363, 1520, 1750, 1849, 2477, 2615, 3011]

3.7 Arctangent

[143, 160, 207]

3.8 Other transcendental functions

[501, 615, 161, 1026, 366, 276, 361, 2104, 1159, 2868, 3063]

4 Binary-decimal conversion

[189, 173, 222, 477, 578, 686, 1167, 1293, 1294, 1407, 1656, 1711, 2004, 1977, 2516, 2608, 2532, 2864]

5 BCD arithmetic

[676, 728, 779, 780, 781, 782, 783, 784, 785, 1384, 1494, 1707, 1642, 2040, 2653, 2969]

6 Multiple precision arithmetic

[293, 331, 411, 429, 634, 618, 955, 1004, 1101, 1100, 1267, 1352, 1432, 1544, 2813, 2797, 3042, 3233]

7 Conferences on computer arithmetic

[7261, 7271, 7276, 7285, 7288, 7301, 7319, 7320, 7362, 7392, 7400, 7394, 7426]

8 Additional contributions from Nelson H. F. Beebe

[121, 136, 169, 215, 298, 347, 368, 450, 754, 557, 850, 879, 923, 924, 976, 990, 1004, 1009, 1072, 1074, 1101, 1100, 1194, 1165, 1223, 1247, 1266, 1273, 1290, 1390, 1427, 1432, 1461, 1462, 7301, 1716, 1726, 1729, 1743, 1749, 1857, 1863, 1897, 1925, 1981, 2024, 2035, 2064, 2107, 2121, 2129, 2174, 2282, 2283, 2336, 2493, 7374, 2538, 2542, 2555, 2562, 2571, 2612, 2624, 7400, 2748, 2749, 2773, 2777, 2794, 2813, 2866, 2867, 2981, 3061, 3278, 208, 215, 216, 252, 283, 295, 307, 308, 312, 343, 363, 422, 441, 475, 494, 528, 572, 594, 618, 641, 712, 796, 829, 831, 847, 866],[899, 901, 906, 928, 949, 975, 977, 984, 986, 1018, 1065, 1073, 1254, 1285, 1359, 1432, 1439, 1463, 1466, 1561, 1566, 1626, 1640, 1649, 1650, 1705, 1746, 1786, 1790, 1809, 1810, 1815, 1817, 1834, 1845, 1846, 1938, 1970, 2015, 2026, 2101, 2146, 2175, 2191, 2256, 2271, 2286, 2308, 2367, 2378, 2382, 2464, 2488, 2494, 2539, 2586, 2600, 2663, 2674, 2710, 2754, 2805, 2869, 2937, 2943, 2977, 3003, 3011, 3046, 3099, 3107, 3185, 3199, 3202, 3246, 3289, 3336, 7232, 7269, 7277, 7286, 7287, 7312, 7324, 7321, 7367]

Title word cross-reference

#26 [5511].

$((2^n)^m)$ [3812]. $(10^{31}-1)/9$ [1978]. (2^m) [4367, 4388, 4572, 4581, 4486]. (2^n+1) [1083, 4806, 3925]. (2^n-1) [5026]. $(2^n-1, 2^{n+p}, 2^n+1)$ [6319]. $(2^n 2^q 1)$ [6119]. $(2^n \pm 1)$ [5538, 4153]. $(2m)$ [4451]. $(2n+3)$ [6583]. $(2n-(2p\pm 1))$ [4868]. $(a\cdot x)\cdot x?$ [6865]. (d,r) [791]. (M,p,k) [5835]. $(\mathcal{R})$ [2917]. (p) [4367, 4451].

$(x+y)*(x-y)$ [6733]. -2 [745, 183, 206, 951, 803]. $-\infty < n < +\infty$ [141, 160]. 0 [5662]. $0 < N < 1$ [161]. $0 \div 0$ [701]. **$1** [3754]. 1 [5006, 4360, 5171, 5663, 3708, 2170]. $1,000,000$ [620]. $1/\sqrt{x}$ [5806]. $1/t$ [2179]. $1/x$ [7216]. 10 [532, 6049]. 116 [4035]. 128 [4874]. 15 [532]. 16 [2511, 4201, 4088]. 17×69 [3056]. 2 [1007, 4318, 2052, 5700, 3238, 4007, 620, 6083, 431, 4360, 5027, 3294, 3472, 1762, 3482, 3149, 3489, 5636, 3504, 532, 322, 3695, 3831, 4467, 3708, 5115, 3372, 4959]. $2,576,980,370,000$ [5664]. $22n+1$ [2151]. 256 [4454]. 27 [434]. $\{2^{(2n+1)}+1, 2^{(2n+1)}, 2^{(2n+1)}-1\}$ [6371]. $2^(n+1)+1\}$ [3984]. $2^{2n+1}-1$ [6064]. $2^{2n+2}-1$ [6064]. 2^{2q} [6054]. 2^8-1 [2864]. 2^k [4499, 5014, 5518, 5055, 5063]. 2^k+1 [868]. 2^{k-1} [4499]. 2^m [4573]. 2^n [1570, 6064, 3984]. 2^n+1 [3984, 5006, 5746, 4477]. $2^{n+1}-1$ [6573]. 2^{n+k} [6573]. $2^n-(2^{n-2}+1)$ [5358]. 2^N-1 [2996, 4841, 6573, 4230, 3984]. 2^q-3 [7085]. $2^q \pm 1$ [6054]. $2^q \pm 3$ [6054]. $2^x p^y \pm 1$ [6286]. 2×2 [5946]. 3 [378, 5008, 4195, 431, 4050, 4219, 4055, 5047, 4892, 322, 6255, 4134, 6658, 4956, 4957]. $3-j$ [299]. 32 [4000, 4454]. 3×3 [2500]. 4 [3984, 4332, 4677, 2528, 2529, 431, 3439, 5751, 5544, 4399, 4733, 2959, 4088, 4090, 2819, 3010, 1934, 3537, 3542]. **$49.95** [3721]. 5 [6054, 4818]. 54×54 [3496]. $6-j$ [299]. 64×64 [2285]. 8 [434, 3452, 4088, 3504]. 84 [308]. **$85.00** [4158, 4159]. 88062 [532]. $8k$ [6905]. 8×8 [5115]. $9-j$ [299]. $<$ [6263]. $>$ [6263]. $[0,1]$ [5171]. ^{0} [4373]. ^{2} [5764]. ^{4} [2804]. ^{5} [3912]. ^{e} [1161]. th [1161]. ^{TM} [4643]. $A(N+C)$ [1912]. $a+b$ [3651]. $a+b+c$ [6347]. $AB+CAB+C$ [7019]. $ab+cd$ [6134]. $ab+cd+e$ [7181]. $a\cdot(x\cdot x)$ [6865]. $A\cdot T$ [4081]. $\arctan Z$ [143]. $a\times b+c\times d$ [6347]. β [6381, 7130]. $C+AB^2$ [4297]. $c/\sqrt{(a^2+b^2)}$ [6328]. $\mathrm{CLP}(R)$ [2937]. $\cos^{-1}$ [3137]. $\cos N$ [180]. $\cos x$ [374]. $\cot^{-1} x$ [374]. d [4711, 5521, 3818]. Δ_2^0 [4960]. e [460]. e^n [141]. e^x [410]. ϵ [3485]. η_T [5692]. ηT [5263]. $\exp(x)$ [1363]. $\exp x$ [374]. $f(x)=0$ [1224]. G_α [811]. $\mathrm{GF}(2)[x]$ [5892]. $GF(2^m)$ [4421, 4790, 4404, 6084, 4993, 5449, 4924, 5896]. $\mathrm{GF}(2n)$ [4216]. $GF(p^m)$ [4669]. H [5188]. I^2L [3247]. ∞/∞ [5034]. K [5457, 4318, 5948, 2111, 6036, 6381, 5992]. $k<m$ [6381]. L [4360]. L^2 [5271]. L^∞ [5270, 7049]. l_2 [6094]. $\ln(x)$ [1531]. $\ln x$ [374]. $\log n$ [1230]. $\log Z$ [143]. LU [6853, 6605]. M [4855, 180, 4148, 2633, 2638, 2647, 2927, 5352, 583, 6381]. $M^E \bmod N$ [2784]. $\mathbf{F}_2[X]$ [7129]. $\mathbf{f}_{2^m}$ [4246]. $\mathbf{F}_{5^{5n}}$ [5710]. $\mathbf{F}_{7^{7n}}$ [5710]. $\mathbf{R}^n$ [6971]. $\mathbf{Z}^2$ [4076, 5054]. $\mathrm{GF}(2)$ [5326, 1694]. $\mathrm{GF}(2^4)^2$ [6199]. $\mathrm{GF}(2^{4\mathrm{n}})$ [3936]. $\mathrm{GF}(2^8)$ [6199]. $\mathrm{GF}(2^{\mathrm{k}})$ [4981, 3783, 4939]. $\mathrm{GF}(2^{\mathrm{m}})$ [5501, 4690, 4999, 3888, 4543, 5160, 3594, 4549, 3899, 5530, 2905, 2906, 3767, 4878, 5326, 5189, 4732, 4402, 5051, 2435, 5450, 4621, 4763, 4925, 5454, 3207, 4297, 4954, 4789, 2315]. $\mathrm{GF}(2^{\mathrm{n}})$ [5013]. $\mathrm{GF}(\mathrm{p})$ [2084]. $\mathrm{GF}(\mathrm{p}^{\mathrm{m}})$ [3500]. $\mathrm{GF}(\mathrm{p}_{\mathrm{k}})$ [4665]. $\mathrm{GF}(\mathrm{q}^{\mathrm{n}})$ [4713]. MECIPTI [283]. μ [1428, 4885, 4927, 2316]. μP [1612, 2010]. N [3979, 810, 2340, 2341, 160, 161, 180, 4592, 5087, 4945, 5992, 5712, 4176, 6094, 1296, 3635]. $n^{\text{ième}}$ [1161]. $N_0' = -N_0^{-1} \bmod W$ [4274]. $N \geq 32$ [5881]. $n\log(n)$ [6521]. $n \times n$ [3148]. $O(1)$ [6419]. $O(n)$ [1197, 3442, 1549]. $O(n^2)$ [2785, 2786]. $O(n\log n)$ [6570, 6724]. Ω [4941]. Arccos$x$ [207]. Arcsin$x$ [207]. Arctan$x$ [207]. mod$p$ [1917]. P [6561, 4653, 2062, 1132, 896, 1046, 1637, 7130, 4290, 4639, 3360]. p^k [6741]. π [1632, 2240, 2241, 4618, 268, 5664, 1695, 460]. $p \times p$ [4597, 4742]. q [5808]. $q*m-n$ [1630]. QR [6159]. R [3615, 3070, 1607, 1615, 6462, 5881].

$r = m^k$ [1440]. r^a [4964]. $r^b - 1$ [4964]. $r^c + 1$ [4964]. $\{r^n - 2, r^n - 1, r^n\}$ [5317]. $r \geq 8$ [5881]. s [4896]. sin(**BIG**) [5252]. $\sin^{-1}$ [3137]. $\sin N$ [180]. $\sin x$ [374]. $\sqrt{(a^2 + b^2)}$ [6328]. $\sqrt{(x)}$ [1483]. $\sqrt{(x/d)}$ [3860]. $\sqrt{2}$ [7053]. $\sqrt{x}$ [1309, 452]. $\sqrt{x^2 + y^2}$ [5700]. T [6622]. $\tan^{-1} x$ [374]. $\theta(\log N)$ [2361]. $\times$ [4081, 3930, 4147]. w [4750]. X [1544, 2902]. $x^2 + ny^2$ [3721]. x^n [6016, 3318]. $x \star (1/x) \neq 1$ [3255]. y [4430]. Z [5349].

-2 [1006]. **-adic** [1132, 1046, 1637, 2062, 896]. **-Approximations** [7049, 5270, 5271]. **-ary** [2927, 4148]. **-b** [3496]. **-Bit** [4000, 6905, 308, 5992, 5087]. **-body** [4592, 4945]. **-circulant** [6462]. **-Coordinate** [4430]. **-count** [6622]. **-CSRmesh** [6507]. **-D** [5700, 4195, 4219, 3294, 6255, 4134, 5115, 3372, 2170]. **-Depth** [3442]. **-Digit** [434]. **-Dimensional** [5521, 2052, 4711]. **-Fold** [5457]. **-Friendly** [5835]. **-function** [5188]. **-gram** [5712]. **-Matrix** [4855]. **-Moduli** [6054, 3984, 4677, 4818]. **-Norms** [6094]. **-Order** [3615]. **-Partition** [6036]. **-Real** [4960]. **-select** [4176]. **-sets** [3070]. **-spaces** [4896]. **-th** [5948, 3818, 5808, 2341]. **-transform** [5349]. **-Vectors** [6094].

.NET [6472, 5090].

/m [4885]. **/spl** [4885].

0.18-CMOS [5802]. **0.4.1rc** [6473]. **0.80pJ** [6609]. **0.80pJ/flop** [6609]. **'00** [7502, 7507, 2547]. **'01** [7516]. **'03** [7545]. **'04** [7554, 7562]. **'07** [7597, 7603, 7605, 7610]. **'08** [7614, 3041, 5397].

1 [217, 3560, 6697, 3423, 2885, 228, 63, 65, 67, 565, 3286, 6731, 4081, 4424, 1165, 5802, 7135, 1935, 3880]. **1-GHz** [6697, 4424, 5802]. **1-Output** [5363]. **1.0** [3881]. **1.24Tflop** [6609]. **1.24Tflop/sW** [6609]. **1.5** [5680]. **10** [5764]. **10-kA** [5764]. **10-kA/cm** [5764]. **10/20** [960]. **100** [2898, 2899]. **100-MFLOPS** [2898, 2899]. **1014** [6808]. **1057** [1983]. **10858** [1748]. **10967** [4378, 5177]. **10967-1** [3286]. **10967-2** [4378]. **10967-3** [5177]. **10th** [7312, 7646, 7394, 7523, 7536, 27, 7293, 2771]. **'11** [7641, 1112, 1393, 1509, 1410, 1314]. **11-bit** [4927]. **11/780** [2038, 1571, 1572, 1805, 1021]. **116** [270]. **1164/WTL** [2035]. **11i** [4942]. **11th** [7514, 7407, 7425, 7426, 3192]. **120B** [1122]. **128-bit** [6369, 4132]. **12th** [7557, 7623, 7268, 7449, 3467, 7609]. **13** [4337, 2093]. **132-Bit** [343]. **13th** [7542, 7284, 7468, 7438, 7596, 3859, 3787, 7666]. **14-Port** [3930]. **144** [2039]. **14th** [7429, 7513, 7544, 7595, 7507, 7493]. **15** [2774]. **15-b** [4469]. **15-bit** [4137]. **15C** [1631]. **15th** [7332, 7603, 7268, 7611, 7515, 7561]. **16-19** [7232]. **16-b** [6510]. **16-Bit** [4548, 6739, 6756, 7145, 6905, 3032, 1262, 1603, 5011, 3085, 1761, 6368, 5987, 1478]. **16-bit-** [1612]. **16-bit-Multiplikation** [1478]. **16-by-8-bit** [1647]. **16-Digit** [5383]. **160-ns** [2843]. **160-Word** [3930]. **1620** [255]. **164** [1817]. **167** [3504, 3542]. **16BST** [1819, 1735, 1736, 1738, 1742, 1752, 1765, 1774, 1691]. **16F/400** [919]. **16th**

[7586, 7577, 4666, 7541, 7583]. **17** [288, 840]. **17-Bit** [650, 649]. **1788** [6597]. **1788-2015** [6108]. **17th** [7648, 7588, 7504, 7578, 7581]. **'18** [7659, 564]. **18-21** [7594]. **18.Mai** [1486]. **18th** [7613, 7602, 7608, 5491]. **18th-Century** [5491]. **1945** [61]. **1947** [7224]. **196** [5708, 5719]. **1962** [7232]. **1965** [7236, 7238]. **1967** [7243, 7245]. **1968** [7248]. **1969** [7246, 7247, 589]. **1971** [7258]. **1972** [7256, 4062]. **1973** [4139, 4140]. **1975** [7265]. **1976** [7266, 7268]. **1977** [7269, 7294, 1654]. **1979** [7274, 7277]. **1980** [7278, 7284, 1527, 7289, 7286]. **1981** [7291, 7296]. **1983** [7312]. **1984** [7321]. **1985** [7338]. **1987** [2090]. **1988** [7341, 7352]. **1989** [7365, 2586]. **1989-01** [2392]. **1989/Taipei** [7365]. **1991** [2642, 7387, 2771]. **1992** [2863, 7450]. **1993** [7418, 7461, 3192]. **1994** [7439]. **1994-12** [3286]. **1995** [7440, 7452, 3467]. **1998** [7478, 7480, 3907]. **1998-12** [3906]. **1999** [7490, 7491, 7496, 7498]. **19th** [7621, 7591]. **1st** [7475].

2 [2181, 6522, 2524, 1736, 64, 66, 68, 4378, 4051, 4590, 6481, 3933, 4910, 530, 2016, 7136, 3526, 4132, 4782, 2829, 3022]. **2-D** [3526]. **2-Digit** [4189]. **2-dimensional** [2997]. **2.0** [3631]. **2.44** [4050, 4219]. **20** [2673, 1402, 2406]. **20-MFLOPS** [2407, 2406]. **200-ns** [1487]. **'2000** [7501, 7500, 7501, 7507]. **2001** [7512, 7513, 7515, 4843, 7517, 7523, 7524]. **2002** [7526, 7527, 7529, 7530, 7531, 7538]. **2003** [7541, 7542, 7545, 7546]. **2004** [7553, 7554, 7556, 7562, 7563, 4902]. **2005** [7570, 7571, 7573, 7576, 7582]. **2006** [7585, 7586, 7589, 7593]. **2006Petrozavodsk** [7643]. **2007** [7597, 7599, 7600, 7602, 7605, 7607, 7617, 7612]. **2008** [7613, 7614, 5503, 7616, 6582, 5954, 5955, 6751, 5555, 5785, 5578]. **2009** [7619, 7623, 7626, 7627, 5536]. **2010** [7636, 7637, 7639]. **2011** [7642]. **2013** [7647]. **2015** [7650, 7651]. **2016** [7655]. **2017** [7656]. **2018** [6494]. **2019** [6548, 7661, 7662]. **2020** [6679, 6677, 6678, 6680, 6681, 6683, 6704, 7663, 6730]. **2020s** [6793]. **2021** [6793, 6794, 6795, 6796, 6804, 7667, 6850, 6869]. **2022** [6910, 6911, 6912, 7669, 6939, 6940]. **2023** [7671]. **20th** [7625, 7665, 7644, 7606]. **21-23** [7623]. **2100** [2565]. **21064** [3352]. **210uW** [6443]. **210uW/MHz** [6443]. **21164** [3397]. **21st** [7631, 7559, 7503, 7647, 7620]. **22** [338]. **22-nm** [6697]. **22nd** [7651]. **22nm** [6609]. **23-28** [7590]. **23nd** [7655]. **23rd** [7377, 7634, 7637]. **24** [1129]. **24-26** [7543]. **24-bit** [2371]. **24.und** [7294]. **24732** [5179]. **248GOPS** [6883]. **248GOPS/W** [6883]. **24b** [2468]. **24th** [7656, 7476, 7479, 7533, 7639, 7294]. **25-28** [7502]. **256** [6325]. **25th** [7373, 7489, 7294, 7604, 7660]. **26-28** [7554]. **26th** [7639, 7662]. **27th** [7663, 7636]. **281** [3064]. **286** [3650]. **28nm** [6883]. **28th** [7667, 7484]. **29.95** [3721]. **29th** [7492, 7669]. **2B** [647]. **2DFFT** [1885]. **2nd** [7635, 4594, 7257]. **2Sum** [6175, 6285].

3 [3102, 5177, 6456, 2777, 6148]. **3-ps** [5802]. **30** [2039]. **30-bit** [2428]. **30-MFLOP** [2252]. **30-ns** [3482]. **300** [4219, 1231]. **300-MHz** [4219]. **300MHz** [4050]. **30th** [7671]. **312** [433]. **3171** [2506]. **31st** [7346]. **32** [5133, 2064]. **32-** [6980]. **32-Bit** [3729, 2319, 2188, 2332, 5495, 4821, 3423, 1405, 5023, 1625, 2742, 2413, 2414, 2415, 2416, 6859, 2564, 1998, 2438, 3320, 2576, 3196, 3966, 2491, 3211]. **320** [3105]. **320-MFLOPS** [3106, 3105]. **320C25** [3298]. **32b**

[2252]. **33** [2218]. **33rd** [7457, 7508, 7401]. **34** [514]. **34-MFLOP** [2491]. **360** [418, 419, 506, 384, 392, 393, 683, 440, 482, 1443, 6490, 539]. **3600** [303]. **36th** [7421]. **370** [1947, 2038, 2485]. **37th** [7607]. **390** [4092, 3826, 3827, 4118, 4119]. **39th** [7597, 7614]. **3CT** [3392]. **3DNow** [3933, 4051]. **3DTV** [5791]. **3m** [6396]. **3rd** [7473, 7261, 7579]. **3X** [5455].

4 [3402, 4807]. **4-2** [1169]. **4-bit** [6772]. **4-Input** [5363]. **4-Input/1-Output** [5363]. **4.4ns** [3496]. **40** [2415]. **40-MFLOPS** [2413, 2415]. **40-ns** [650]. **400** [919]. **4000** [499]. **400MHz** [3930]. **400th** [7450]. **4096-Core** [6898, 6780]. **40ns** [649]. **41** [444]. **432** [1858]. **44th** [7593]. **45th** [3774]. **48th** [7576]. **4d** [4688]. **4m** [6396]. **4th** [7271, 7502, 7396, 7524, 7670].

5 [3552, 4161, 7000]. **50** [2330]. **50-Megacycle** [149]. **50-MHz** [2330]. **501** [3791, 3641]. **50th** [7433]. **512** [6405, 7061, 7199]. **512-bit** [6925]. **528** [1120, 4033]. **53*53** [3272]. **53nd** [7632]. **54** [339]. **54-b** [2843]. **55-b** [3482]. **5th** [7540, 7622, 7288, 7591, 7447].

6.7-MFLOPS [2449, 2451]. **60** [607, 580, 411]. **600** [3999]. **600-MHz** [3999]. **6000** [3392, 2542, 638, 2567, 2571, 1244, 3374, 719]. **6000/7000** [1038, 1244]. **600MHz** [4092]. **601** [3352]. **603e** [3624]. **60M** [2641]. **60M-flops** [2641]. **64** [4795, 4006, 4181, 4041, 4207, 4208, 6568, 4253, 4128]. **64-active-instruction** [3538]. **64-b** [3650, 2966, 3538]. **64-Bit** [2439, 3930, 7125, 2327, 2330, 5404, 5146, 5005, 3078, 3440, 5171, 2719, 3456, 2406, 2407, 2552, 2411, 2933, 6980, 2776, 2266, 3334, 4943, 2035]. **64-bit-Universal-Floating-Point-ISA-Compute-Engine** [6568]. **6400** [1696]. **64b** [2329]. **65** [626]. **65-nm** [7125]. **65/6600** [626]. **650** [2092]. **651** [2051]. **65nm** [6443]. **6600** [733, 556, 626, 593, 1347]. **6600/7600** [733]. **665** [2206]. **68000** [1886]. **68000-Einplatinenrechner** [2083]. **693** [2813]. **6th** [7587, 4851, 7552, 7301, 7491, 7606, 7469, 7582, 7556].

7-9 [7625]. **70** [5704]. **7000** [1244]. **7094** [398, 474]. **7094-II** [474]. **70th** [5616]. **714** [3061]. **715** [3063, 3678]. **719** [3042]. **722** [3062]. **7289** [7053]. **73** [1031]. **754** [3853, 5587, 2865, 4320, 3405, 6070, 3990, 4526, 5503, 6548, 6938, 3881, 4342, 6827, 4840, 6833, 6834, 1411, 6579, 6847, 6207, 1863, 6582, 2096, 3462, 3627, 5616, 5962, 5340, 4248, 5062, 5198, 6976, 6618, 7118, 7119, 2278, 6494, 6378, 7130, 1681, 4769, 3951, 5657, 2018, 1460, 6773, 7198, 3361, 5573, 5578, 5813, 7153]. **754-1985** [1862, 1863]. **754-2008** [5440, 5503, 6582, 5578]. **754-2019** [6581, 6548]. **754-Posit** [6976]. **754r** [5431, 5136, 5149, 5281, 5504, 5182, 5235, 5181, 5194, 5383]. **7600** [733]. **77** [1192, 4033, 1333]. **780** [2038, 1571, 1572, 1805]. **786** [3955]. **'79** [7274, 7277]. **7th** [7278, 7280, 7585, 7319, 7349, 7590].

8 [1297]. **8-Bit** [3820, 6895, 7032, 1969, 7083, 7107, 6986, 7124, 6505]. **8-to-64** [6609]. **80** [1485]. **80*87** [3023]. **80-bit** [1930]. **80-FLOPS** [2966].

8000 [3456]. **80287** [1905]. **8080/8085** [1585, 1135, 1221]. **8080A** [1489]. **8085A** [2393]. **8086/80286** [1937]. **8087** [1631, 1317, 1905]. **8087/80287** [1937, 1905]. **8087/80287/80387** [2296]. **8088/8087** [1735]. **80960** [2248]. **80960KB** [2249]. **80b** [2450]. **80h** [1297]. **80's** [7283]. **814** [4457]. **8231A** [4157]. **826** [6443]. **'83** [7304]. **83S87** [2519]. **'84** [7313]. **842** [5016]. **'85** [7318, 482]. **854** [3412, 3413, 2090, 3486]. **854-1987** [2042, 2090]. **'86** [7325, 7326]. **86**^{TM} [3929]. **871** [5460]. **'88** [7347, 7348, 7351, 2312]. **881** [5519]. **'89** [7359, 7366]. **89/TI** [4470, 4471]. **8s** [767]. **8th** [7371, 7571, 7480, 7333, 5646].

9 [518, 697]. **9-11** [7599]. **9.4** [6883]. **'90** [7369, 7378, 7393, 4313, 3396, 4976, 4977, 2683, 3494, 4457, 3845]. **908** [5676]. **90nm** [4807]. **'91** [7390, 7393, 417, 396]. **'92** [7399, 7402, 7405, 7413, 4470, 4471]. **'93** [7416]. **'94** [7428, 7429, 7438]. **'95** [7445, 3858, 4453, 4766]. **954** [6086]. **'96** [7459, 7463]. **96-bit** [2262]. **97** [3722]. **'98** [7476, 7484, 3976, 7474]. **980A** [1017]. **'99** [7489, 7490, 7491]. **9th** [7362, 7637, 7594, 7296, 2363].

= [2807, 2808, 3354, 7258].

_Imaginary_I [5573].

A-Priori [2104]. **A.K** [4683]. **a.k.a** [5550]. **A/D** [3897, 907, 3354, 4137, 4469, 803]. **A/D-konverter** [3354]. **A1** [1100, 1194]. **Aarhus** [7301, 7301]. **Abacus** [202, 1028, 5554]. **Abbreviating** [7]. **abc}** [4825]. **ABE** [548]. **ABI** [6906]. **Abnormal** [6789, 6058]. **Abotec** [3186]. **Absolute** [3399, 3400, 2767, 2256, 433]. **Abstract** [5595, 4554, 5632, 527, 5346, 5876, 6391, 4852, 2917, 2115, 5877, 4905, 4917, 2991]. **abstraction** [5490, 5854, 1331]. **abstraction-based** [5490]. **Abstracts** [7417, 7508]. **Abu** [408]. **Acadiana** [7480]. **ACBAM** [6998]. **ACBAM-Accuracy-Configurable** [6998]. **Accelerate** [6630, 6318, 4592]. **Accelerated** [6832, 5029, 5502, 5716, 6475, 7020, 7144]. **Accelerating** [5480, 6063, 4813, 3876, 5726, 6949, 6831, 6198, 7078, 7101, 4247, 6748, 6359, 4740, 6364, 5794]. **Acceleration** [6719, 6853, 6224, 7219, 6846, 6465]. **Accelerator** [6065, 6805, 6528, 5708, 5720, 7060, 5745, 7081, 6336, 6966, 6355, 2257, 6481, 6752, 7117, 6038, 6995, 4925, 7143, 7013, 7221, 6656, 6420, 2270, 7133]. **Accelerators** [6953, 7069, 6591, 7088, 6858, 7109, 6485, 7151, 4785, 7024, 5293, 3510]. **Acceptance** [3494]. **Access** [2147, 5124, 3405, 4595, 4649, 7020]. **Accessibility** [7569]. **Accessible** [6948]. **Account** [3, 5573]. **Accumulate** [6543, 5000, 6442, 6849, 6461, 6758, 7003, 5985, 3834, 6670, 6783, 4518, 6608, 3679]. **Accumulated** [1369, 576, 978]. **Accumulation** [6289, 2058, 1960, 179, 5950, 6215, 5322, 6114, 5561, 4440, 77, 454, 1073, 3716, 5833, 3742, 3767, 5771, 575, 5558, 2770, 95, 5463]. **accumulations** [4247]. **Accumulator** [3870, 4778, 6262, 380, 2700, 1033, 3320, 5803, 5891, 4780]. **Accumulators** [6536, 6357, 371, 1074]. **accuracies** [2606]. **Accuracy** [4657, 217, 6266, 7037, 6920, 1716, 5485, 862, 1016, 4811, 5404, 7167, 6816, 6817, 2681, 5921, 6076, 3244, 5928, 6186, 5289, 5157, 6193, 1842, 227, 228, 7174, 7175,

7208, 434, 390, 1291, 1853, 3617, 4563, 4375, 2384, 6452, 1747, 1982, 2546, 1622, 7084, 1985, 5945, 6332, 1629, 2404, 7089, 3123, 754, 5192, 6746, 833, 5197, 3802, 6998, 5800, 3169, 6251, 3686, 165, 7003, 1686, 2022, 2023, 6773, 411, 3534, 6893, 7015, 495, 6784, 6785, 5395, 7026, 5903, 5687, 5832, 1814, 4672, 5919, 6298, 6824, 6081, 6956, 3766, 3099, 1746, 6733, 2550, 2101, 1995, 5191, 5865, 5193, 6474]. **accuracy** [3795, 1757, 5355, 6141, 7126, 1680, 107, 2464, 1690, 1923, 1786, 6389, 2303, 3199, 6504, 3850, 546, 5129, 2054, 1212, 3655, 652, 1354, 2574]. **accuracy-adjustable** [7126]. **accuracy-guaranteed** [5355]. **Accurate** [5589, 5133, 1806, 2652, 2655, 2872, 7166, 1386, 4352, 4538, 4539, 4540, 4693, 4835, 4836, 3747, 4356, 6010, 6188, 6303, 4018, 5294, 2698, 6086, 4708, 4848, 4850, 5300, 2705, 5419, 5526, 5532, 4372, 6580, 6107, 5944, 5615, 5763, 5948, 5949, 3291, 5950, 6215, 230, 2554, 2243, 6967, 6601, 3305, 906, 572, 3477, 641, 5783, 6617, 7322, 4908, 4909, 5080, 6240, 6039, 2982, 1537, 5088, 5456, 5457, 5458, 5564, 5647, 5977, 5978, 3688, 3823, 3825, 4936, 5104, 4127, 2612, 6048, 6890, 3025, 599, 5993, 4498, 1796, 5822, 3054, 5267, 3245, 3426, 4694, 4186, 2368, 5525, 6310, 4213, 5943, 1869, 5946, 2738, 3127]. **accurate** [759, 760, 2957, 4747, 2965, 4749, 6139, 4262, 2150, 4461, 5230, 3012, 2845, 5473, 5249, 1096]. **Accurately** [3568, 6541, 2516, 5761, 5048, 2608, 4935, 6542, 6293, 4822, 4823, 5629, 5654]. **ACE** [947, 5121]. **achieved** [3029]. **Achieving** [6057, 5404, 5706, 6306, 1842, 4753, 5884]. **ACL2** [7526, 4279]. **ACL2-2002** [7526]. **ACM** [7341, 7428, 7553, 7554, 7569, 7570, 7584, 7597, 7613, 7614, 7589, 7516, 7532, 2093, 7538, 7555, 2350, 7446, 7393]. **ACM/IEEE** [7584]. **ACM/SIGDA** [7553, 7570]. **ACM/SIGPLAN** [7555]. **Acoustics** [7325, 7391, 7545, 7562]. **Acousto** [1908]. **Acousto-Optic** [1908]. **acquisition** [2505, 2673]. **ACRITH** [1982, 1814, 2546, 1985, 1871, 2106]. **ACRITH-XSC** [2546]. **across** [5340]. **ACSSC** [7617]. **ACT8837** [2342]. **ACTION** [6969]. **Activation** [6703]. **Activations** [6340]. **active** [5791, 3538]. **Activity** [5901]. **Actual** [5333, 6532]. **acyclic** [3214]. **Ada** [7428, 7371, 7407, 1874, 7428, 2325, 2648, 2649, 2874, 2875, 3234, 2509, 2666, 3429, 2356, 2076, 6088, 2530, 7407, 1527, 1751, 2107, 1758, 3647, 2772, 2142, 2816, 1703, 2844, 1485]. **Ada-Europe** [7407]. **Ada83** [3045]. **adaptable** [4344]. **Adaptation** [2878, 4414, 6878]. **adapted** [6020]. **Adapting** [2937, 4033]. **Adaptive** [5845, 6586, 4234, 3118, 1635, 2927, 6745, 6856, 6231, 2452, 1771, 3693, 3694, 3828, 1464, 1551, 7013, 2178, 1949, 1584, 1722, 4820, 4992, 6448, 5172, 2396, 3789, 3921, 1757, 2432, 6129, 2968, 3153, 5799, 3705, 5665]. **ADC** [4368, 2457, 4147, 4963]. **ADCOM** [7603]. **Add** [6525, 5488, 3056, 4675, 4990, 6289, 4335, 5500, 7059, 6189, 5168, 2543, 6727, 5318, 3457, 6458, 3908, 4396, 5336, 5337, 5338, 3129, 5780, 5562, 5644, 5447, 5448, 5087, 6999, 4770, 7146, 6255, 6400, 6669, 6551, 4499, 2334, 4815, 5703, 3060, 3592, 5021, 4039, 5028, 6203, 4568, 5032, 4582, 4886, 4080, 6027, 5065, 4749, 3157, 5653, 4777, 4950, 1706, 4651, 4792]. **add/sub** [3592]. **Addendum** [1232, 764]. **Adder** [6064, 3729, 3982, 4319, 4821, 5499, 4996, 1104, 5283, 2894, 336, 6952, 1126, 5757, 6456, 5764, 755, 3797, 6623, 5969, 6037, 3806, 3668, 6624, 5358, 5359, 4439, 4279, 4931, 5657, 7007, 5987, 535, 591, 938, 5379, 5578, 6892, 6502, 6399,

5386, 5581, 133, 5248, 5393, 804, 2188, 4991, 2682, 6006, 3068, 2891, 3262, 6958, 5740, 4562, 2909, 3114, 3115, 3116, 3117, 1430, 2755, 5964, 2115, 4894, 5785, 2962, 4260, 2799, 7000, 1169, 5803, 5891, 4631, 5461, 4943, 2485, 5814]. **Adder-Based** [6064, 3114, 3115, 3116, 3117]. **Adder/Subtractor** [5757, 6456, 6892, 4894, 5785]. **Adders** [6057, 4316, 609, 5705, 3057, 4173, 5497, 868, 6828, 6829, 6438, 5734, 2078, 2080, 5612, 5421, 5538, 4230, 5039, 4066, 4391, 6113, 6467, 6226, 6860, 5199, 7108, 7189, 6754, 2003, 6761, 2790, 3818, 4284, 4455, 5383, 4477, 1182, 1193, 1496, 2338, 2668, 3873, 4007, 5613, 2733, 1901, 5789, 4751, 4097, 7123, 3339, 7195, 5235, 7198, 2481, 4474, 4783]. **adders/subtractors** [7198]. **Addictive** [1873]. **Adding** [1384, 3402, 2331, 3881]. **Addition** [1362, 6512, 2041, 1088, 805, 1373, 7044, 464, 552, 4330, 4990, 3737, 4172, 4335, 1825, 4997, 1109, 673, 6432, 1395, 5605, 5297, 3081, 1515, 508, 5014, 6195, 1127, 1614, 3444, 5614, 6583, 5321, 745, 4877, 1875, 4392, 4069, 5952, 6119, 4734, 4888, 5053, 1145, 4895, 363, 3148, 1440, 5971, 1445, 5358, 7194, 4102, 923, 924, 3167, 2282, 1677, 2143, 455, 3823, 5093, 7006, 788, 213, 934, 3833, 4127, 3193, 5571, 5239, 6503, 5582, 415, 1707, 377, 5125, 4153, 3230, 4169, 4327, 4815, 3872, 4680, 3579, 4179, 4687, 6435, 2527, 4701, 1514, 1970, 510, 6714, 2904, 3266]. **addition** [4216, 2924, 4883, 2745, 3643, 4247, 1649, 1650, 3655, 2768, 3935, 2267, 3811, 4099, 4268, 2590, 2983, 654, 712, 4932, 928, 3703, 376, 847, 1929, 3199, 3708, 494, 3847, 2634]. **Addition-based** [5014]. **Addition-Related** [5971]. **Addition/Subtraction** [4172, 5952, 4734, 7006, 3872, 4680]. **additional** [3376]. **Additions** [7128, 3622, 3469, 1938]. **Additive** [4534, 5055, 5783, 486, 3604, 1665]. **Additively** [6620]. **Address** [2679]. **Addressable** [5075, 1562]. **adds** [1374, 6126]. **Adelaide** [7493]. **adequate** [2191]. **Adiabatic** [4778]. **adic** [1132, 1046, 1637, 2062, 896]. **Adjustable** [2107, 5568, 7126]. **adjustment** [3746]. **Ado** [2094]. **ADPCM** [3180, 3181]. **ADSP** [2565, 2951]. **ADSP-2100** [2565, 2951]. **Advance** [6852, 4813]. **Advanced** [3858, 4359, 5312, 3456, 7603, 4579, 7337, 7460, 7494, 7505, 7534, 7548, 7565, 3484, 3494, 5562, 7408, 7397, 1542, 2293, 935, 5241, 4484, 1814, 6925, 7587, 2033, 7521, 7580]. **Advances** [7226, 7237, 1222]. **Advancing** [2335]. **Advection** [6921]. **Adversarial** [6845]. **Aerospace** [7539]. **AES** [6799, 6199, 6493]. **af** [1369]. **Affair** [3418]. **affiliated** [7526]. **Affine** [6524, 4600, 6667, 4832, 5273, 4706, 5750, 5348, 5218]. **Affirmative** [3]. **AFIPS** [7230, 7317]. **after** [2016, 3702]. **Afternotes** [3702]. **Again** [6432, 1910]. **Against** [6398, 6337, 4419, 4604, 4606, 4750, 4650]. **Age** [5024]. **aggregation** [5357, 5441]. **aggressive** [4080]. **ago** [6145]. **Ahead** [5234, 804, 607]. **Ahmad** [408]. **ähnliche** [1701]. **AI** [6956, 6961, 6479, 7138, 7140, 7149, 6895, 5918]. **AI-based** [7149]. **AI/ML** [6961]. **Aid** [14, 683, 5076, 1563]. **Aided** [7620, 7446, 7516, 7563, 7395, 7463]. **Aiken** [4139]. **air** [4566]. **Aircraft** [51]. **Airy** [5918]. **Aizu** [7498]. **Aizu-Wakamatsu** [7498]. **al** [408, 408, 408]. **al-Fusul** [408]. **al-Hasan** [408]. **al-Hindi** [408]. **al-Uqlidisi** [408]. **ALA'01** [4843]. **Alabama** [7405]. **Alamos** [2758]. **Alan** [7572, 705]. **Albena** [7392]. **Albuquerque** [7390]. **Alegre** [7599]. **Alessandro** [7497]. **Algebra** [3559, 4517, 1582, 7318, 7430, 4352, 6434, 4843, 7089, 6862, 3494, 7138, 5998, 6288, 2069, 3892, 4716, 6959, 6734, 6735, 5869, 834, 2963]. **Algebraic**

[7601, 7274, 5148, 430, 2373, 4200, 7474, 389, 5316, 5762, 3777, 3638, 7459, 4398, 2148, 7550, 1072, 3835, 5229, 7510, 5115, 7413, 7640, 7235, 7241, 7154, 4304, 45, 5269, 1828, 516, 517, 4238, 4397, 3311, 2122, 7277, 5883, 2977, 1680, 5218, 4784, 458]. **Algebraic-integer** [2373]. **Algebraicznych** [458]. **ALGOL** [580, 736, 759, 580, 493, 541, 273, 411]. **algorism** [4689, 1028]. **Algorithm** [1710, 5254, 1711, 1262, 3975, 4972, 6520, 3044, 3227, 3727, 3864, 1808, 3047, 727, 6920, 5263, 1374, 809, 1494, 2051, 5489, 6414, 6690, 6530, 6808, 1100, 1816, 3409, 4989, 3570, 1499, 5709, 3737, 816, 5713, 1822, 2205, 5280, 3998, 2346, 2062, 1019, 1827, 2878, 5154, 2354, 1833, 3077, 4018, 5727, 6440, 1117, 1837, 429, 4029, 4850, 6196, 5527, 3442, 4865, 3614, 3769, 4045, 4564, 4047, 4217, 4218, 6578, 2388, 2724, 1619, 5030, 5749, 5751, 6208, 742, 3460, 974, 5540, 2093, 5765, 1632, 1875, 5326, 3299, 2743, 830, 6966, 5956, 6117, 3470, 314, 5331, 5332, 4076, 2428, 5055, 1050]. **Algorithm** [5628, 2109, 571, 2111, 262, 642, 4743, 2117, 6977, 764, 2956, 1651, 1892, 2119, 2261, 5352, 2573, 6233, 6484, 1656, 6371, 1899, 4428, 2782, 2969, 4430, 1534, 1663, 2785, 2786, 3673, 6872, 6038, 7194, 4916, 5446, 5793, 1159, 2596, 6146, 4922, 925, 2144, 926, 7132, 777, 4627, 1245, 2017, 5658, 6046, 373, 3830, 4129, 3193, 4134, 4465, 5107, 1695, 6256, 457, 4473, 2830, 3531, 2160, 491, 5577, 5808, 5895, 5988, 597, 6664, 3713, 1480, 244, 3215, 3544, 5126, 4296, 2637, 1712, 605, 2178, 2043, 4800, 6521, 3562, 3865, 5259, 6413, 3410, 1584, 1722, 4820, 2669, 2670, 3414, 5147, 3238]. **algorithm** [2677, 2514, 3996, 3580, 3423, 5718, 3741, 3426, 3247, 4349, 4350, 3885, 3886, 6303, 3591, 3079, 467, 4700, 4702, 5012, 4024, 3592, 1206, 5305, 4854, 2220, 5852, 5733, 6310, 1973, 3899, 4211, 3268, 3447, 3448, 4216, 2908, 516, 517, 2723, 4048, 3904, 5946, 4726, 5037, 2405, 750, 5767, 2740, 2741, 5185, 2557, 2744, 6744, 5866, 4583, 3472, 4586, 4587, 3640, 3793, 5058, 2946, 2253, 5872, 575, 4898, 763, 579, 1764, 2957, 4901, 5067, 1893, 985, 5437, 6032, 3316, 6372, 2784, 5881, 3154, 5560, 2787, 2976, 1909, 2977, 2455, 4758, 5445, 2136, 2590, 4618, 4764, 4926, 999, 1066, 3347, 3185, 3698, 3526]. **algorithm** [1924, 3527, 2609, 294, 1929, 2819, 3010, 5108, 4781, 5467, 5468, 4293, 3199, 6504, 661, 2490, 3208, 3372, 4788, 5473, 5123, 6053, 3382, 7202, 4961, 6707, 3042, 3563, 2051, 6808, 1194, 2206, 3061, 3062, 3063, 3064, 385, 6086, 1120, 1207, 5016, 5519, 433, 4033, 514, 6447, 566, 2092, 3678, 5460, 270, 2813, 3955, 4457, 5676, 6855]. **algorithm-based** [2253, 3526, 3208, 3372, 3382]. **Algorithmen** [2400, 2236, 2574, 1701, 2307]. **Algorithmes** [4692, 5341, 4358, 2764]. **Algorithmic** [5847, 7590, 3912, 252, 3669, 2804]. **Algorithmics** [7116, 4496, 5103]. **Algorithmique** [5103, 4496]. **Algorithms** [852, 2040, 6676, 4158, 4159, 724, 1807, 3863, 857, 667, 1013, 6919, 7571, 3232, 5400, 5696, 6285, 1267, 1377, 5406, 5408, 1586, 276, 3064, 6294, 3878, 4686, 1107, 5839, 2883, 4536, 4537, 4692, 3252, 4538, 3743, 6083, 1024, 1025, 1026, 1114, 6950, 5417, 3081, 4023, 4190, 6557, 5160, 2074, 2366, 6833, 6834, 5518, 3083, 469, 3753, 738, 825, 879, 6715, 1519, 6093, 5525, 885, 4207, 5170, 2541, 7615, 4215, 4374, 3617, 4563, 3618, 3903, 1521, 1414, 1523, 3284, 4222, 4723, 4724, 3107, 3108, 5756, 2548, 3109, 6214, 6736, 2400, 2236, 4231, 829, 523, 1422, 3914, 7638, 524, 6741, 3120]. **Algorithms** [4574, 3300, 4393, 632, 5864, 5333, 2939, 1530, 4077, 3129, 2942, 3306, 7460, 7580, 1051, 6864, 3649,

1641, 1889, 688, 1642, 692, 1643, 4897, 7338, 7352, 4415, 5064, 4599, 3310, 448, 357, 478, 6752, 361, 3656, 7212, 5068, 4421, 2574, 3805, 7112, 4425, 1324, 3808, 3326, 1442, 3812, 1445, 4266, 1446, 1772, 6039, 2797, 3817, 7409, 7214, 6041, 6879, 5977, 5978, 7397, 7002, 4625, 776, 2463, 3515, 5364, 927, 7135, 7136, 713, 3696, 374, 4128, 1343, 2610, 2820, 2821, 5806, 5894, 3014, 941, 2832, 3843, 1701, 2307, 5580, 3370, 1475, 3378, 7200, 5125, 5394, 7203, 553, 3218, 1085, 3561]. **algorithms** [5480, 5998, 4513, 4983, 4325, 5143, 6175, 6283, 6810, 6923, 7360, 2672, 2204, 221, 3874, 1962, 420, 4005, 1829, 1201, 2689, 3069, 3427, 4835, 2210, 1838, 3256, 4699, 6954, 3436, 225, 5162, 5165, 6096, 6444, 7387, 4039, 4719, 5743, 6959, 1301, 3280, 5320, 1984, 743, 2927, 4395, 2418, 3125, 4588, 1756, 2429, 3795, 832, 1757, 1884, 1639, 5630, 7494, 7505, 7521, 7534, 7548, 7565, 4082, 2568, 4745, 3140, 2764, 5066, 5201, 2440, 2572, 5203, 5438, 6486, 4093, 5882, 4095, 1444, 1665, 5641, 6241, 2273, 4917, 2459, 4618, 2598, 4105, 3944, 4626, 3175, 3176, 3517, 5366, 2469, 1786, 2025, 5230]. **algorithms** [4779, 3009, 1075, 2831, 3200, 494, 1705, 4954, 5392, 3027, 4962, 2352, 2049, 7338, 7352, 358, 2008, 1063, 1539, 4683]. **Algorithmus** [2049, 385, 2008, 1539]. **Alignment** [5971, 3867, 3931]. **alignments** [1922]. **all-one** [4993]. **Allerton** [7244]. **Alley** [3614]. **allgemeine** [1096, 1212]. **allgemeiner** [1354]. **Allocatable** [3483, 3494]. **Allocation** [6652, 4555, 5767, 4601, 4603, 4474, 3362]. **Alloy** [5875, 6029]. **Almost** [7228, 2286, 5058]. **ALOHA** [7214]. **ALOHA-FP2I** [7214]. **Alpha** [2994, 3397, 2886, 3520, 3352]. **alphabetical** [101]. **Alps** [6856]. **also** [2970]. **Alternanten** [769]. **Alternate** [4433]. **alternating** [3646]. **Alternative** [1281, 6718, 6594, 6978, 6419, 963, 576, 6378, 4649]. **Alternatives** [4316, 1144, 6476, 3138, 4612, 4729]. **Alto** [7477, 7463]. **ALU** [4310, 5479, 5685, 6443, 2099, 1904, 1661, 5804, 2035, 1800, 2852]. **ALUs** [2171]. **always** [6163]. **am** [1654, 7294, 2616]. **Am25S05** [622]. **Am29000** [2270]. **Am29027** [2270]. **Am29050** [2577]. **Am29C327** [2321]. **Am9511A** [1382]. **Am9511A/Am9512** [1382]. **Am9512** [1272, 1382]. **ambiguity** [4965]. **AMD** [6907, 6560, 4051, 3933, 4093, 3943, 3944, 4107, 4279]. **AMD-K7**^{TM} [4093, 3944]. **AMD5** [3929]. **ameliorating** [1039]. **amélioration** [4325]. **America** [23]. **American** [2042, 7297, 7232, 2863, 31]. **Amherst** [7660]. **Amidst** [6840]. **Among** [1223, 4088]. **amount** [4037]. **Amounts** [3749, 3891, 4019]. **amplifier** [2225]. **Amplifiers** [184]. **Amplifying** [1720]. **Amsterdam** [7600, 7665]. **AN-Codes** [4360]. **AN/UYK** [840]. **AN/UYK-17** [840]. **Anaheim** [7329, 7357, 7385]. **Analog** [463, 111, 4202, 3606, 139, 140, 230, 113, 232, 444, 370, 4108, 132, 150, 4152, 2897, 4863, 4049, 691, 4927, 1689, 3704, 2316]. **Analog-To-Digital** [4152, 4202, 4863, 3704]. **Analogrechenschaltungen** [549]. **analogue** [549, 1065, 3214]. **analogue-to-digital** [3214]. **Analyse** [5714, 40, 7258]. **Analyses** [4365, 3911, 1468, 2822]. **Analysis** [604, 2174, 7279, 152, 4308, 1805, 5137, 7443, 6689, 6524, 4322, 6525, 6284, 3407, 6692, 2876, 171, 5709, 5494, 1586, 2338, 2672, 5713, 1590, 2678, 1387, 1019, 6820, 7417, 6183, 3880, 6706, 7057, 6553, 2358, 6438, 7062, 7171, 820, 4855, 7311, 112, 5735, 4859, 5737, 5853, 2903, 3092, 6574, 6575, 126, 4564, 2225, 7664, 4051, 6729, 397, 3285, 7334, 2918, 6211, 2396, 398, 629, 2732, 2921,

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5638, 6233, 6483, 1439, 3930, 1153, 2122, 2773, 7118, 4424, 2450, 2451, 6485, 6623, 6756, 5968, 917, 5078, 5969, 6037, 3806, 5205, 5354, 7117, 3494]. **Floating** [2782, 4094, 3664, 3666, 3668, 3809, 3810, 4093, 5081, 2576, 2971, 2577, 5971, 4431, 7213, 2785, 2786, 5440, 7120, 2005, 646, 1060, 1326, 2580, 2269, 4270, 6239, 647, 6762, 1158, 1236, 1328, 5973, 6038, 5642, 2132, 7125, 703, 4273, 4439, 6039, 2273, 2793, 2794, 3161, 2009, 6628, 5562, 839, 2797, 2982, 1774, 6145, 2589, 3164, 4919, 5644, 5447, 5448, 2010, 6490, 6491, 2279, 993, 2985, 7214, 2280, 1240, 3682, 923, 924, 6244, 2281, 995, 3167, 2282, 4622, 5645, 2283, 6246, 2805, 5088, 5456, 5457, 5647, 5979, 4279, 6765, 6496, 1542, 6384, 1681, 454, 1682, 6385, 3946, 3947, 5090, 1545, 4110, 2601]. **Floating** [1456, 1777, 4930, 5092, 5364, 2289, 4118, 4285, 4455, 4770, 5093, 5801, 7135, 4629, 5095, 2992, 1687, 7140, 1778, 5657, 5890, 2602, 3694, 4934, 2468, 269, 212, 2152, 2993, 2019, 5804, 1548, 2470, 789, 1688, 2813, 2999, 3187, 3188, 3189, 3353, 3699, 3700, 2294, 5984, 6254, 7007, 7146, 3354, 6150, 6151, 6640, 2022, 2023, 1691, 1692, 3004, 5985, 2608, 4935, 5223, 5224, 5225, 5226, 5461, 5462, 5463, 5464, 5465, 2817, 3005, 845, 1340, 1460, 1461, 1787, 5568, 3957, 3958, 5106, 1342, 2298, 4129, 2027, 5893, 4288, 6255, 3960, 1788, 5570, 2477, 2614, 2615, 3011, 5109, 5110, 1467, 5571, 6773]. **Floating** [1791, 5233, 5377, 3530, 4942, 6153, 6653, 4137, 594, 3358, 4472, 6391, 7149, 6048, 7150, 6501, 1074, 5378, 2029, 3842, 850, 5379, 5572, 2830, 3199, 3531, 2832, 6775, 3361, 6392, 2834, 2835, 1351, 5113, 1077, 5574, 5895, 3709, 1352, 3845, 3202, 6260, 6502, 6503, 2306, 3964, 215, 6400, 1471, 1703, 2624, 1704, 5119, 5242, 5386, 5387, 5581, 5582, 5669, 5672, 6505, 1558, 1356, 1473, 1474, 1475, 1476, 3968, 2035, 7218, 5813, 7153, 2036, 3020, 3021, 5990, 216, 3210, 2309, 6262, 2844, 4298, 6158, 134, 1799, 5245, 7201, 5991, 2632, 801, 1359, 3028, 1708, 3542, 5393, 5816, 4152, 950, 1943]. **Floating** [6780, 6898, 6899, 5993, 6669, 5126, 5585, 5676, 5127, 5394, 5251, 6671, 5602, 5723, 5923, 4641, 6395, 4296, 1939, 2177, 3386, 5395, 664, 2859, 1945, 1946, 6508, 3973, 1566, 5679, 6264, 3032, 3720, 3857, 5475, 5476, 6058, 6163, 6059, 722, 297, 1487, 2499, 2641, 3038, 3223, 3391, 3392, 3393, 3394, 4505, 6408, 6517, 6518, 7033, 2500, 1087, 1012, 5684, 1802, 2319, 1803, 1804, 1364, 2321, 1571, 1572, 2044, 2322, 4800, 6167, 4162, 1489, 2503, 2869, 3046, 5591, 5909, 2046, 1370, 1809, 2185, 2504, 2186, 5910, 4317, 2048, 2326, 7038, 2650, 3230, 3048, 2327, 4320]. **floating** [5261, 5262, 1093, 2187, 1372, 2330, 5832, 4805, 2505, 1192, 5142, 3867, 2331, 6281, 2332, 2191, 2653, 2654, 3054, 1815, 4325, 4520, 4671, 4808, 4809, 4810, 5143, 5265, 6000, 6283, 3732, 1718, 300, 2192, 668, 5268, 5593, 4328, 3868, 1017, 4813, 5403, 5594, 7046, 7047, 7164, 2193, 1018, 1195, 6417, 5836, 6694, 3235, 4991, 3569, 1817, 2195, 2663, 7166, 6419, 1956, 6537, 1379, 6538, 3412, 6290, 1380, 4820, 4992, 2669, 3237, 380, 1587, 6421, 3871, 4995, 1820, 2059, 2673, 3738, 3873, 5917, 1382, 1724, 2205, 2342, 4526, 5500, 3995, 3996, 6003, 4822, 4823, 3999, 1591, 5502, 5716]. **floating** [6181, 4179, 2682, 1106, 1963, 4005, 4689, 4533, 422, 5505, 3423, 5718, 7206, 2349, 2879, 2880, 2881, 3881, 4011, 3246, 6300, 2687, 6301, 5412, 5413, 961, 1278, 2689, 6431, 6006, 5724, 3068, 2887, 3250, 3427, 4539, 4694, 4835, 6185, 6081, 4014, 3070, 249, 4839, 5156, 5286, 4353, 963, 4542, 5603, 6709, 5158, 2523, 5291, 2524, 5005, 2355, 4186,

2891, 5292, 2210, 504, 1735, 1736, 2893, 6012, 4017, 1204, 5294, 5159, 5513, 736, 1118, 5011, 4191, 4192, 6954, 4704, 4705, 5606, 1514, 1970, 2367, 1738, 1971, 821, 510, 3752, 1206, 5301, 1031, 6306, 2899, 2371, 4853, 6714, 4711]. **floating** [5848, 4712, 283, 3085, 3262, 4714, 4856, 3086, 2533, 623, 881, 1032, 1210, 1285, 1741, 3439, 2901, 3087, 1033, 2710, 1845, 5523, 1846, 2537, 1847, 5733, 2377, 4859, 4860, 1848, 5419, 6016, 6095, 6563, 1289, 2378, 252, 178, 3897, 2382, 1852, 4368, 4863, 3898, 2539, 6958, 4038, 6721, 6722, 3089, 4039, 5023, 3606, 5854, 7075, 4040, 4557, 4718, 6567, 2903, 2904, 3608, 6448, 3092, 3445, 3609, 1293, 1409, 1215, 1976, 3611, 2224, 3446, 1410, 1299, 3271, 3099, 4046, 2225, 4565, 2909, 2542, 3100, 2719, 5314, 5315, 1746, 2912, 6453, 6580, 6728, 5747, 2087, 5748, 518, 828, 1217, 2390]. **floating** [5750, 683, 2392, 1220, 1865, 1748, 3286, 3621, 5177, 5178, 5180, 5536, 2228, 2229, 4050, 4568, 7209, 3620, 1135, 1221, 1868, 2393, 4725, 5943, 2915, 4570, 5758, 5759, 1626, 3289, 6018, 6212, 6329, 6330, 6459, 201, 2091, 3624, 6019, 6463, 2232, 2920, 3111, 3290, 6020, 2234, 2402, 2403, 2235, 3112, 2095, 2096, 3462, 3627, 3628, 4227, 4229, 5616, 5764, 4727, 2924, 3292, 3464, 3630, 3293, 6112, 630, 475, 746, 2406, 2407, 2408, 2409, 748, 749, 1226, 2242, 2101, 1634, 312, 522, 4879, 4880, 6337, 2742, 1227, 1228, 2413, 2415, 2416, 1753, 1876, 1529, 1754, 5623, 6853, 3636, 3916]. **floating** [4395, 3124, 3301, 4883, 5625, 2933, 3469, 5329, 831, 899, 975, 1995, 4239, 5955, 6116, 4885, 2558, 3303, 901, 977, 2935, 7093, 2248, 2249, 5957, 6468, 6343, 3919, 3920, 5865, 5193, 7184, 6223, 757, 2749, 2937, 3126, 4584, 5868, 6122, 6023, 5961, 4889, 3792, 4409, 4590, 352, 4592, 3923, 6859, 4890, 526, 573, 5629, 1759, 5340, 3643, 5630, 5963, 1640, 5342, 5343, 4247, 6027, 4892, 6608, 2254, 7211, 1052, 1997, 1315, 2950, 3650, 575, 642, 759, 760, 402, 690, 691, 576, 6028, 2256, 4894, 1998, 1999, 982, 911, 3135, 1436, 2568, 4597, 4742, 6129, 3138, 2258, 2118, 2764, 5065, 2259, 5345]. **floating** [3144, 6750, 7107, 1648, 1649, 1650, 697, 2570, 5785, 5876, 3486, 5347, 4901, 5067, 5349, 5350, 5351, 5435, 5556, 6980, 2571, 2001, 3929, 5070, 5437, 320, 1896, 2262, 2442, 2445, 2770, 3660, 6033, 2963, 2964, 919, 7114, 2448, 2449, 986, 4260, 3320, 4749, 2266, 3153, 6236, 3321, 3322, 3935, 2453, 3811, 4910, 6991, 3327, 582, 4911, 5355, 5882, 6238, 482, 4262, 3155, 3156, 5356, 5560, 6141, 5883, 987, 4265, 4099, 4268, 5791, 767, 988, 3814, 4100, 7123, 4755, 3334, 6143, 4914, 1329, 2006, 5792, 7124, 2270, 208, 702, 991, 2271, 2977, 2272, 3816, 7126, 2274, 2586, 3336, 528]. **floating** [7127, 3505, 2275, 7223, 2590, 2799, 2984, 4920, 2278, 3339, 4103, 5795, 6242, 2458, 2593, 2803, 2594, 2595, 1775, 2140, 1334, 5085, 6878, 994, 530, 1242, 1243, 1335, 708, 1064, 2986, 1065, 3340, 1679, 485, 4926, 3509, 775, 5976, 5649, 5650, 5885, 6249, 5798, 3943, 3944, 4107, 1338, 4927, 4624, 1915, 3168, 107, 5799, 5653, 6497, 999, 2987, 2464, 3945, 5654, 3685, 3343, 778, 2015, 2286, 2600, 2146, 7134, 4928, 6045, 711, 712, 3179, 3826, 4119, 4769, 5565, 2466, 3948, 4456, 4932, 4933, 5802, 3950, 3691, 2807, 2808, 2990, 2991, 2809, 3350, 3184, 2291, 3693, 3828, 4630]. **floating** [928, 3185, 3518, 2018, 3519, 1067, 3952, 5219, 4126, 4457, 6768, 3829, 2473, 1690, 1923, 3003, 4632, 2295, 1171, 2474, 2475, 4458, 4459, 4634, 5100, 5101, 5102, 5227, 5228, 5369, 5370, 5371, 5372, 1786, 1462, 293, 1463, 2026, 4777, 3703, 4132, 376, 324, 4779, 847, 2825, 2826, 3195, 3196, 5108, 1930, 3704, 147, 1466,

1789, 1932, 2301, 1936, 1790, 3012, 5232, 6389, 3013, 1698, 848, 3357, 4469, 4943, 1073, 3359, 1348, 4138, 4294, 7198, 1793, 3706, 1794, 1699, 1938, 4141, 4295, 2031, 943, 6393, 4946, 4947, 717, 796, 3707, 1795, 2622, 2483, 2485, 4475, 4476, 2033, 5240, 1353]. **floating** [2837, 2165, 494, 3205, 2488, 851, 3966, 2491, 3016, 4786, 4952, 5241, 5388, 5812, 6261, 2492, 1797, 1705, 1357, 1798, 542, 543, 544, 2167, 2308, 5120, 797, 2493, 2494, 1257, 295, 1706, 2168, 3211, 3376, 1940, 1561, 2311, 2495, 1358, 2628, 4145, 1800, 1562, 4955, 5247, 5584, 5814, 949, 2631, 4147, 4299, 4956, 4957, 5815, 600, 799, 2849, 7020, 194, 2851, 2314, 2496, 2853, 2854, 3214, 3852, 7202, 5249, 4962, 4963, 5128, 5130, 4651, 4792, 4793, 2316, 6786, 7025, 5152, 2352, 2690, 1254, 6528, 1733, 3907, 4887, 1886, 3657, 3197, 2305, 2306, 2307, 2486, 2487, 1477, 5601, 997]. **floating-** [5395, 5917]. **Floating-Decimal** [134]. **Floating-Point** [2042, 7034, 3971, 2636, 4654, 4967, 5255, 5820, 5587, 4655, 7030, 7205, 4968, 3975, 6512, 7031, 6266, 4660, 5136, 6407, 6409, 6682, 7032, 5682, 5683, 5826, 5827, 5906, 6800, 4978, 3399, 3982, 4164, 4165, 4166, 1951, 4514, 2329, 4802, 6803, 2506, 3731, 5694, 862, 1016, 1096, 2050, 2656, 2872, 5266, 5486, 5696, 5911, 6067, 6068, 6069, 6414, 6806, 3407, 3408, 2053, 6070, 2508, 2054, 729, 2335, 5914, 6176, 1268, 1269, 1378, 4330, 6418, 6693, 7052, 3568, 6536, 5492, 247, 866, 5708, 3236, 3413, 5146, 6697, 2667, 1585, 5595, 2671, 3574, 4335, 5495, 5837, 6927, 1272, 6292]. **Floating-Point** [732, 1387, 1504, 1727, 2346, 3062, 4000, 6180, 4002, 1200, 1276, 1728, 5920, 3878, 4006, 5149, 5281, 5503, 5504, 2878, 4338, 3421, 3422, 3583, 2064, 6187, 6183, 4343, 6822, 2520, 2521, 6706, 4345, 4833, 618, 5926, 5927, 6079, 6827, 6946, 5289, 5157, 6553, 4356, 6948, 1967, 2068, 6189, 3890, 1734, 2892, 2894, 5416, 506, 6712, 4544, 5297, 5515, 3432, 4023, 4190, 1839, 6192, 2216, 1280, 6833, 6834, 1513, 6193, 4196, 7066, 2218, 6559, 5015, 5845, 1281, 2219, 2898, 6307, 4546, 5729, 3754, 1972, 5521, 879, 4035, 882, 1286, 6839, 2708, 2709, 4715, 5418, 5939, 6308, 6716]. **Floating-Point** [1404, 1611, 6717, 4365, 4554, 5526, 307, 2222, 2223, 2379, 1851, 4202, 7073, 5739, 6841, 4864, 971, 392, 393, 5309, 3900, 2541, 6843, 5612, 1977, 972, 6576, 2545, 2720, 2911, 6204, 6324, 1302, 5318, 5855, 3903, 1133, 6207, 1620, 6581, 1862, 1863, 1864, 2089, 2090, 6582, 7082, 5179, 5754, 6730, 3105, 3106, 4219, 343, 5614, 6109, 5944, 5540, 5760, 5762, 5945, 5947, 6328, 6460, 4381, 3908, 5541, 1223, 6214, 6332, 6736, 1629, 5950, 6215, 345, 1225, 1309, 1418, 1988, 2922, 3775, 3909, 3910, 4228, 4382, 4571, 4872, 4873, 5035, 5425, 5857, 4385, 3777, 744, 747, 7087, 5322, 1872, 2552, 6591]. **Floating-Point** [892, 1043, 3298, 5544, 7210, 829, 2414, 2930, 5327, 5328, 5861, 3784, 752, 753, 895, 1047, 5954, 3302, 6598, 6599, 6742, 6967, 6968, 6341, 6218, 6346, 6121, 5050, 2750, 6220, 4888, 5053, 6221, 6349, 6601, 5775, 5776, 1530, 441, 5336, 5337, 7096, 7098, 2109, 5196, 6025, 833, 906, 1432, 572, 5777, 6226, 3306, 2943, 2944, 2252, 2431, 6357, 2754, 4902, 2562, 6609, 641, 688, 2564, 5965, 6479, 1642, 2761, 7104, 5873, 6863, 4596, 527, 578, 1150, 3484, 5634, 4417, 7108, 7189, 984, 5555, 5346, 2439, 5557, 1765, 6231, 6621, 643, 1897, 2121, 2263, 2443, 2444, 3150, 5071, 5638, 6233]. **Floating-Point** [6483, 1153, 2773, 2450, 2451, 6485, 6623, 6756, 917, 5078, 5205, 5354, 2782, 4094, 3666, 3668, 3809, 2971, 5971, 2785, 2786, 5440, 7120, 2005, 646, 1326, 2580, 2269, 6762, 6038, 7125, 703, 4273, 6039,

2793, 2794, 3161, 6628, 5562, 4919, 5644, 5447, 5448, 6491, 2279, 2280, 1240, 3682, 923, 924, 6244, 2281, 995, 3167, 2282, 4622, 2283, 2805, 5088, 5456, 5457, 5647, 5979, 6765, 6496, 1682, 6385, 3947, 1545, 4110, 1456, 1777, 4930, 5092, 5364, 4455, 4770, 5093, 5801, 7135, 5095, 2992, 7140, 5657, 5890, 3694, 2468, 212, 2993, 2813, 2999, 3187, 3188, 3353, 3699, 3700, 2294, 5984, 6254, 7007]. **Floating-Point** [7146, 6150, 6151, 6640, 2022, 3004, 2608, 4935, 1460, 1461, 1787, 5568, 5106, 1342, 5893, 1788, 5570, 2477, 2614, 2615, 3011, 1467, 5571, 6773, 1791, 3530, 4942, 6153, 6653, 4137, 594, 3358, 6391, 6048, 7150, 5378, 2029, 850, 5572, 2830, 3531, 2832, 6775, 3361, 6392, 5895, 3845, 3202, 6260, 6503, 2306, 215, 1471, 1703, 2624, 5119, 5242, 5386, 5387, 5581, 5582, 5672, 1356, 2035, 7218, 3021, 216, 3210, 2309, 6262, 5245, 7201, 2632, 801, 3028, 1708, 5393, 4152, 6898, 6899, 6669, 5126, 5585, 5676, 5127, 5394, 5251, 6671, 5723, 5923, 4641, 6395, 4506, 7028, 4501, 2175, 2176, 417, 3224, 1949]. **Floating-point** [4314, 6526, 2333, 7043, 7044, 1580, 1581, 1720, 5271, 6533, 4815, 4990, 2510, 6420, 2674, 2675, 2676, 6002, 6072, 1503, 1826, 2207, 2065, 3741, 5287, 4697, 1396, 4706, 2531, 2375, 308, 3760, 5169, 1298, 5535, 1300, 3906, 7083, 4224, 4223, 4055, 3294, 258, 2929, 4577, 897, 6114, 6340, 4582, 4886, 6743, 2424, 6858, 6475, 1761, 3652, 981, 3136, 6977, 6363, 2260, 3930, 2122, 2577, 5642, 2009, 2010, 6246, 3946, 4285, 4934, 2152, 2470, 2298, 2027, 4288, 6255, 7149, 3842, 5379, 3199, 2834, 2835, 1077, 3709, 1352, 6502, 1473, 1474, 1475, 1476, 5991, 6780, 5602, 1939, 2177, 3386, 2859, 3973]. **floating-point** [1566, 6264, 5476, 6163, 722, 1487, 2641, 3038, 3391, 3392, 3393, 4505, 6408, 6517, 2500, 1087, 5684, 1802, 2319, 1803, 1804, 6167, 4162, 2869, 3046, 5591, 5909, 5910, 2326, 7038, 2650, 2327, 4320, 5261, 5262, 2187, 2330, 5832, 4805, 5142, 2332, 2191, 2653, 3054, 1815, 4325, 4808, 4809, 5143, 6000, 6283, 3732, 2192, 5268, 5593, 4328, 1017, 4813, 5403, 5594, 7046, 7047, 2193, 1018, 1195, 6417, 5836, 6694, 3235, 4991, 2195, 7166, 6537, 1379, 3412, 4992, 1587, 6421, 4995, 2059, 2673, 3873, 4526, 3996, 3999, 1591, 5502, 5716, 6181, 1963, 4005, 4689, 5505, 7206, 2349]. **floating-point** [2879, 2880, 2881, 4011, 6301, 5412, 5413, 2689, 6431, 5724, 3068, 4539, 4014, 3070, 249, 4839, 5156, 5286, 4353, 963, 4542, 5158, 5005, 2355, 4186, 2891, 5292, 504, 1735, 1736, 6012, 5294, 736, 1118, 4192, 6954, 1970, 1738, 1971, 821, 510, 5301, 1031, 6306, 2899, 2371, 4853, 6714, 4711, 4714, 4856, 3086, 623, 881, 1032, 1210, 1285, 1741, 3439, 2901, 3087, 1845, 5523, 1846, 2537, 1847, 5733, 4859, 4860, 6016, 6095, 6563, 1289, 252, 178, 1852, 4368, 4863, 6958, 6721, 6722, 5023, 3606, 5854, 4040, 4557, 4718, 2903, 2904, 3445, 3609, 1409, 1215, 1976, 3446, 3271, 4565]. **floating-point** [2542, 5314, 5315, 1746, 6453, 6580, 6728, 5747, 2087, 5748, 1217, 5750, 2392, 1220, 1865, 1748, 3621, 5178, 5180, 5536, 2228, 2229, 4050, 7209, 1135, 1221, 1868, 4725, 5943, 2915, 5758, 5759, 1626, 6018, 6212, 6329, 6330, 6459, 6019, 2234, 2402, 2403, 3112, 2095, 2096, 3462, 3627, 3628, 4227, 4229, 5616, 5764, 4727, 2924, 3292, 3464, 3293, 630, 475, 746, 2406, 2407, 2408, 2409, 4879, 6337, 2742, 2413, 2415, 2416, 1529, 1754, 5623, 6853, 3636, 3916, 4883, 5625, 3469, 831, 899, 975, 4239, 5955, 6116, 4885, 2558, 3303, 7093, 2248, 2249, 5957, 6468, 6343, 3919, 3920, 5865, 6223]. **floating-point** [757, 2749, 2937, 3126, 4584, 6122, 6023, 5961, 4889, 4409, 4590,

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7409, 1163, 5457, 5978, 1338, 7397, 780, 2472, 3008, 4464, 7228, 4476, 193, 4647]. **IIB** [1935]. **III** [7269, 6277, 6651, 7358, 6915, 245, 547, 7342, 2211, 1026, 469, 4910, 482, 3162, 781, 7229]. **IIR** [1538]. **Ill** [4569, 2805, 2148, 1039, 192, 193]. **ill-condition** [1039]. **Ill-Conditioned** [2805, 2148, 4569, 192, 193]. **ILLIAC** [547]. **Illinois** [7270, 7266, 7319, 7232]. **ILUT** [5779]. **ILUT-based** [5779]. **im** [7492, 2260, 1654, 7294, 124]. **IMA** [7338, 7334]. **IMA/SIAM** [7334]. **IMACS** [7429, 7609, 7452, 7429, 7400, 7520, 7293]. **IMACS-GAMM** [7400]. **Image** [6904, 1818, 2898, 6997, 1931, 3528, 4305, 2342, 6702, 5011, 2899, 3288, 1989, 3788, 2570, 3338, 3511, 3705, 3205, 4147]. **Images** [5642]. **Imaginary** [279, 203, 1425, 3938, 1170, 231, 236, 1001]. **Imaging** [7398, 2272]. **Immune** [4650]. **IMP** [919]. **IMP-16F** [919]. **IMP-16F/400** [919]. **Impact** [870, 1198, 1205, 5314, 5315, 5952, 4080, 5892, 5476, 6291, 6878, 5651]. **Impacting** [6851, 6989]. **impacts** [7438]. **imperfection** [3509]. **implantations** [4327]. **Implement** [6204, 7111, 1192]. **Implementable** [2040]. **Implementation** [7369, 7555, 7028, 5587, 7029, 5589, 7160, 5136, 3861, 4974, 4975, 1569, 6799, 1805, 4799, 7161, 805, 1808, 2325, 6412, 6919, 1577, 5263, 610, 6926, 1723, 1959, 5713, 1505, 1276, 1389, 5149, 5281, 5504, 5000, 3425, 4833, 4351, 5414, 5509, 3747, 3077, 1969, 2526, 5008, 2364, 6953, 5844, 964, 4357, 1972, 4201, 557, 6562, 5166, 1848, 1212, 1291, 6199, 5528, 626, 5611, 6447, 6567, 7615, 3270, 3769, 4045, 4215, 2386, 1980, 6324, 2388, 3103, 1412, 6207, 4051, 6325, 6209, 5757, 5540, 6111, 1628, 2092, 6332, 1307, 743, 5764, 5182, 6852, 2099, 6963, 4389, 5326, 1992, 2246, 5429, 3470]. **Implementation** [4399, 2106, 6118, 6344, 6121, 6347, 5867, 6472, 5775, 6024, 3792, 5055, 3129, 5779, 1760, 1887, 3643, 3475, 6976, 3310, 3144, 1651, 1151, 5636, 3805, 7110, 916, 1658, 4427, 4428, 3323, 3324, 2127, 3326, 5971, 2005, 1326, 2132, 6488, 3501, 5643, 4617, 2142, 6146, 5645, 4447, 7000, 4109, 486, 4111, 5093, 7141, 4124, 3829, 1693, 1927, 5893, 4289, 2477, 2614, 2615, 3011, 1933, 1936, 3012, 5233, 6652, 4473, 1252, 2832, 1349, 2833, 6663, 7015, 3373, 7019, 4151, 2632, 1941, 4153, 5723, 1354, 4652, 5679, 5684, 1571, 4801, 1950, 2193, 3991, 4819, 1501, 2513, 2342, 4682, 4529, 4008, 2882, 4184]. **implementation** [5413, 2354, 5508, 5842, 3586, 3887, 4840, 3748, 5292, 3079, 6954, 4027, 1206, 2368, 5305, 3085, 3599, 3439, 5307, 2537, 5733, 7387, 1852, 4863, 2539, 3899, 6448, 4212, 3271, 5942, 4046, 3451, 6731, 6210, 5759, 2091, 2093, 2553, 2740, 2247, 2420, 4884, 831, 899, 975, 4885, 5330, 2424, 4075, 3472, 5961, 4589, 2108, 5433, 3132, 4082, 5781, 3651, 5784, 6751, 1764, 2570, 2440, 5202, 5203, 2965, 3322, 4093, 3158, 3330, 3331, 4100, 2275, 2799, 2801, 1679, 5455, 4932, 1169, 2018, 5805, 2469, 1548, 2997, 2021, 2295, 5892, 5664, 1174, 2157, 5235, 848, 4293, 7198, 1177, 2480, 4482, 5583, 2842]. **implementation** [4491, 4494, 2690]. **Implementations** [6162, 5682, 5683, 5826, 5827, 3232, 7165, 6543, 5409, 4692, 6712, 4366, 3761, 3764, 4576, 6472, 3131, 7460, 7580, 4599, 4088, 3808, 1904, 4265, 4102, 5446, 7397, 6633, 3182, 3525, 3699, 3700, 2613, 3532, 4142, 4642, 6779, 3215, 6078, 4692, 1263, 3048, 2662, 4176, 4182, 5412, 3256, 3436, 3450, 2735, 5329, 3303, 6348, 6471, 3640, 3793, 1759, 7494, 7505, 7521, 7534, 7548, 7565, 4103, 2599, 4768, 3829, 5097, 5240, 4950, 3016, 4956, 4301]. **Implemented** [3407, 865, 893, 7130, 6398, 3732, 2058,

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5836, 6694, 3235, 4991, 3569, 2510, 1817, 4816, 2195, 2663, 7166, 6419, 6420, 1956, 6537, 1379, 6538, 3412, 6290, 1380, 4820, 4992, 2669, 3237, 380, 1587, 2670, 6421, 3871, 4995, 1820, 2059, 2673, 3738, 3873, 5917, 1382, 1724, 2205, 2674, 2675, 2676, 6002, 6072, 2342]. **point** [3059, 4526, 5500, 3995, 3060, 3996, 6003, 4822, 4823, 3999, 1503, 1591, 1826, 2207, 5502, 5716, 6181, 4179, 2682, 1106, 1963, 4005, 4689, 4533, 422, 2065, 5505, 3423, 5718, 7206, 3741, 2349, 2879, 2880, 2881, 3881, 4011, 3246, 6300, 2687, 6301, 5412, 5413, 961, 1278, 2689, 6431, 6006, 5724, 3068, 2887, 3250, 3427, 4539, 4694, 4835, 6185, 7169, 6081, 4014, 3070, 249, 4839, 5156, 5286, 5287, 4353, 4697, 963, 4542, 5603, 6709, 5158, 2523, 5291, 2524, 5005, 2355, 4186, 2891, 5292, 2210, 504, 1735, 1736, 1834, 2893, 6012, 4017, 1204, 1396, 5294, 5159, 5513, 736, 1118, 5011, 4191, 4192]. **point** [6954, 4704, 4705, 5606, 4706, 1514, 1970, 2367, 1738, 4707, 1971, 737, 821, 510, 823, 3752, 6713, 7068, 7172, 1206, 5301, 1031, 2076, 6306, 2899, 2371, 4853, 2531, 6714, 4711, 5848, 4712, 283, 3085, 3262, 4714, 4856, 5849, 3086, 2533, 623, 881, 1032, 1210, 1285, 1741, 3439, 2375, 2901, 3087, 1033, 2710, 1845, 5523, 969, 1846, 2537, 1847, 5733, 2377, 4859, 4860, 1848, 5419, 6016, 6095, 6563, 1289, 1612, 2378, 252, 178, 308, 2714, 3897, 2382, 1852, 4368, 4863, 3898, 2539, 6958, 4038, 6721, 6722, 3089, 4039, 3760, 5023, 3606, 5854, 7075, 4040, 4557, 4718, 6567]. **point** [3765, 5169, 2903, 2904, 3266, 3608, 4209, 6448, 1038, 3092, 3445, 3609, 1293, 1409, 5028, 1215, 1976, 3611, 2224, 3446, 1410, 1298, 3271, 3099, 5942, 4046, 2225, 3451, 5535, 4565, 2909, 2542, 3100, 1300, 2719, 5314, 5315, 1746, 6726, 2912, 6453, 6580, 6728, 5747, 3276, 3277, 2087, 5748, 518, 2725, 828, 1217, 2390, 5750, 683, 2392, 3906, 1220, 1865, 7083, 1748, 3286, 3621, 4224, 5177, 5178, 5180, 5536, 2228, 2229, 4050, 4568, 5320, 7209, 3620, 1135, 4223, 1221, 1868, 2393, 4725, 5943, 2915, 4570, 5758, 5759, 1626, 3289, 6018, 6212, 6329, 6330, 6459, 2396, 201, 2091, 4055, 3624, 6019, 6463]. **point** [2232, 2920, 3111, 3290, 6020, 2234, 2402, 2403, 2235, 3112, 1987, 628, 2095, 2096, 3462, 3627, 3628, 4227, 4229, 5616, 5764, 4727, 2924, 3292, 3464, 3630, 3293, 6112, 630, 475, 746, 2406, 2407, 3294, 3295, 2408, 2409, 748, 749, 1226, 258, 5040, 2553, 2242, 2101, 1634, 312, 522, 4879, 4880, 6337, 2742, 1227, 1228, 2413, 2415, 2416, 2929, 1753, 1876, 1529, 1754, 5623, 6853, 3636, 3916, 4395, 3124, 3301, 1989, 4883, 5625, 4577, 897, 2933, 3469, 5329, 831, 899, 975, 1995, 6114, 4239, 5955, 6116, 4885, 2558, 3303, 901, 977, 2935, 7093, 2248, 2249, 6340, 5957, 6468, 4582, 4886]. **point** [6343, 6743, 3919, 3920, 5865, 5193, 7184, 6223, 350, 757, 2424, 2749, 2937, 3126, 4584, 5868, 6122, 6023, 5961, 6858, 4889, 3792, 4409, 4590, 352, 6475, 4592, 3923, 6859, 4890, 526, 573, 685, 5629, 1759, 5340, 3643, 5630, 5963, 1640, 5342, 5343, 4247, 6027, 4892, 6608, 2254, 1891, 7211, 1052, 1997, 1315, 1761, 2950, 3650, 575, 642, 759, 760, 402, 3652, 690, 691, 981, 576, 6028, 2256, 4894, 1998, 1999, 982, 911, 3135, 6228, 3136, 1436, 2568, 4597, 4742, 5784, 6129, 3138, 2258, 2118, 6977, 6363, 2764, 5065, 2259, 5345, 3144, 6750, 7107, 1648, 6751, 3147, 1649, 1650, 697, 2570, 2260]. **point** [5785, 5876, 3486, 5347, 4901, 5067, 5349, 5350, 5351, 5435, 5556, 6980, 2571, 2001, 3929, 5070, 5437, 320, 1896, 2262, 2442, 2445, 2447, 2770, 3660, 6033, 1439, 3930, 2122, 2963, 2964, 919, 5640, 7114, 5438, 2448, 2449, 986, 4260, 3320, 4749, 2968, 2266, 3153,

6236, 3321, 3322, 3935, 4093, 2453, 3811, 4910, 6991, 2577, 3327, 582, 4911, 5355, 5882, 6238, 482, 4262, 3155, 3156, 5356, 5560, 6141, 5883, 987, 4265, 4099, 4268, 5791, 767, 988, 3814, 4100, 7123, 4755, 3334, 6143, 4914, 647, 1329, 2006, 5792, 5642, 7124, 2270, 208, 702, 991, 2271, 2977, 2272, 3816, 7126, 2273]. **point** [2274, 2586, 3336, 2009, 528, 7127, 3505, 2275, 839, 7223, 2590, 2799, 2984, 4920, 2010, 2278, 3339, 4103, 5795, 6242, 2458, 2593, 2803, 2985, 2594, 2595, 1775, 2140, 1334, 5085, 6878, 994, 530, 1242, 1243, 1335, 708, 1064, 2986, 1065, 3340, 5975, 1679, 485, 4926, 3509, 775, 5976, 6246, 5649, 5650, 5885, 6249, 5798, 3943, 3944, 4107, 1338, 4927, 4624, 1915, 3168, 107, 5799, 5653, 6497, 999, 2987, 2464, 3945, 3946, 5654, 3685, 3343, 778, 2015, 2286, 2600, 2146, 7134, 4928, 6045, 782, 711, 712, 3179, 3826, 4119, 4769, 5565, 3948, 4285, 4456, 4932, 4933, 5802, 3950]. **point** [3691, 2807, 2808, 2990, 2991, 2809, 1687, 3350, 3184, 5983, 2291, 3693, 3828, 4630, 4934, 928, 3351, 3185, 3518, 2018, 3519, 2152, 1067, 3952, 5219, 1548, 2470, 789, 4126, 4457, 6768, 3829, 2473, 1690, 1923, 3003, 4632, 1692, 2295, 1171, 2474, 2475, 4458, 4459, 4634, 5100, 5101, 5102, 5223, 5224, 5225, 5226, 5227, 5228, 5369, 5370, 5371, 5372, 5461, 5462, 5463, 5464, 5465, 2817, 3005, 1786, 1462, 2298, 293, 1463, 2026, 2027, 4777, 3703, 4132, 376, 324, 4288, 4779, 847, 2825, 2826, 3195, 3196, 6255, 5108, 1930, 3704, 4780, 4135, 147, 1466, 1789, 1932, 2301, 1936, 1790, 3012, 5232]. **point** [6389, 3013, 1698, 848, 3357, 4469, 4943, 1073, 3359, 1348, 4138, 7149, 4294, 7198, 1793, 3706, 1794, 3842, 5379, 1699, 1938, 3199, 4141, 4295, 2031, 943, 6393, 2834, 2835, 4946, 4947, 717, 796, 3707, 1077, 5574, 1795, 2622, 2483, 2485, 3709, 4475, 4476, 1352, 2033, 6502, 5240, 1353, 2837, 2165, 494, 2488, 851, 1704, 3966, 2491, 3016, 4786, 4952, 5241, 5388, 5812, 6051, 6261, 2492, 1797, 1473, 1474, 1475, 1476, 1705, 1357, 1798, 542, 543, 544, 3968, 2167, 2308, 5120, 797, 2036, 2493, 2494, 1257, 295, 1706, 2168, 3211, 3376, 1940, 1561, 2311, 2844, 2495, 1358]. **point** [2628, 2629, 4145, 5244, 1800, 1562, 4955, 5247, 5584, 5814, 5991, 949, 2631, 4147, 4299, 4956, 4957, 7156, 5815, 600, 799, 1359, 2849, 7020, 194, 2851, 2314, 6780, 2496, 2853, 2854, 3214, 3852, 7202, 5249, 4962, 4963, 5128, 5130, 4651, 4792, 4793, 2316, 6786, 7025, 5152, 5602, 5924, 6077, 2352, 2690, 1254, 1939, 5601, 6528, 1733, 3907, 4887, 1886, 3197, 2305, 2306, 2307, 2486, 2487, 1477, 997]. **Point-Targeted** [6952]. **Point/Integer** [2351]. **point/logarithmic** [2301]. **Pointers** [3494]. **Points** [2054, 5835, 5762, 3675, 3973, 7048, 3657]. **Poisoning** [6906]. **Poland** [7517, 7666]. **Polar** [6667]. **Polish** [458]. **Pollard** [2120]. **Polyhedra** [4018]. **Polyhedron** [3613, 4044]. **Polymath** [1323]. **Polymorphic** [903]. **Polynomapproximation** [770]. **Polynome** [1063]. **Polynomial** [4653, 4980, 6524, 6805, 3053, 5402, 6416, 5493, 4172, 5279, 5280, 4352, 6552, 6012, 280, 6084, 5160, 820, 427, 885, 3615, 5760, 3296, 5326, 1141, 6966, 1879, 5332, 5628, 4255, 4899, 6978, 478, 5787, 838, 918, 1445, 5209, 770, 4762, 1916, 2151, 373, 271, 4129, 7155, 2635, 4794, 416, 4513, 4668, 3049, 3050, 5264, 4674, 5270, 5405, 6075, 2212, 5159, 5513, 6836, 4849, 3598, 621, 5525, 3766, 563, 5613, 5752, 5615, 5763, 5948, 5432, 6970, 2114, 448, 3147, 985, 1235, 3500, 5360, 2007, 483, 4924, 5975, 2464, 1455, 5218, 2603, 2812, 2995, 2997, 4135, 4640]. **polynomial** [4644, 3379, 3380, 3029, 5600, 1254, 4608]. **polynomial-based**

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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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- solution sets of linear systems,
- hardware and software systems for interval computations, and
- 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,
- 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
- on the Interval Computations homepage `http://cs.utep.edu/interval-comp/main.html`, in the "Books" section.

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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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result. Interval arithmetic is an improvement on this, but still not an ideal solution because if the final interval is larger than desired, there is no simple way to restart the computation at higher precision. By contrast, in XR no precision level is set in advance, and no computation takes place until a final request takes place for some output. Despite this, programming with XR is no different from MPFP, except for the declaration of critical variables as type 'XR'.

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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- branch and bound algorithms for global optimization,
- constraint propagation,
- solution sets of linear systems,
- hardware and software systems for interval computations, and
- 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,
- 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
- on the Interval Computations homepage `http://cs.utep.edu/interval-comp/main.html`, in the "Books" section.

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