

SPECIFICATION

GIER
ELECTRONICS

SELECTED EXECUTION TIMES IN GIER ALGOL

SOFTWARE

ALGORITHMIC ENTITY	EXAMPLE	EXECUTION TIME (ms)
Addition	$a + b$	0.12
Multiplication	$a \times b$	0.18
Division	a / b	0.21
Square	$a \uparrow 2$	0.18
Cube	$a \uparrow 3$	0.4
Power, Integer Exponent	$a \uparrow i$	
abs (exponent) = 1		3.8
10		5.5
100		8.0
1 000		10.0
10 000		12.0
100 000		14.0
1 000 000		16.0
Power, Real Exponent	$a \uparrow r$	12.0
Subscripted Variable		
1 subscript	$A[i]$	0.9
2 subscripts	$B[i, j]$	1.2
3 subscripts	$C[i, j, k]$	1.5
Step Until Element, Constant Step and Simple Upper Limit, Each Loop	step 1 until n	0.6
Block with Simple Variables	begin real a; end	1.4
Block with Array Declaration	begin array a [1:10]; end	3.0
Reference to Formal Parameter Called by Name		
Actual Parameter:		
simple		0.4
expression		3.2
array identifier		0.0
switch identifier		0.0
procedure identifier		0.0
Call of Declared Procedure Having an Empty Procedure Body		
no parameter	P;	3.8
1 parameter	Q(a);	4.7
2 parameters	R(a, b);	5.2
3 parameters	S(a, b, c);	5.3
Call of Standard Procedure		
abs	abs(x)	0.17
arctan	arctan(x)	6.6
cos	cos(x)	8.0
exp	exp(x)	5.8
ln	ln(x)	5.6
sign	sign(x)	3.2
sin	sin(x)	5.8
sqrt	sqrt(x)	6.2

Correlation of Bits with Integers and Decimal Digits

Magnetic Tape Utilization



CORRELATION OF BITS WITH INTEGERS AND DECIMAL DIGITS

Number of Bits	Maximum Unsigned Integer	Maximum Number of Decimal Digits
1	1	0
2	3	
3	7	
4	15	1
5	31	
6	63	
7	127	2
8	255	
9	511	
10	1 023	3
11	2 047	
12	4 095	
13	8 191	
14	16 383	4
15	32 767	
16	65 535	
17	131 071	5
18	262 143	
19	524 287	
20	1 048 575	6
21	2 097 151	
22	4 194 303	
23	8 388 607	
24	16 777 215	7
25	33 554 431	
26	67 108 863	
27	134 217 727	8
28	268 435 455	
29	536 870 911	
30	1 073 741 823	9
31	2 147 483 647	
32	4 294 967 295	
33	8 589 934 591	
34	17 179 869 183	10
35	34 359 738 367	
36	68 719 476 735	
37	137 438 953 471	11
38	274 877 906 943	
39	549 755 813 887	
40	1 099 511 627 775	12
41	2 199 023 255 551	
42	4 398 046 511 103	

MAGNETIC TAPE UTILIZATION

Characters/Block	Blocks/Reel	Characters/Reel	Utilization %
10	37 501	375 010	2
20	36 643	732 860	5
30	35 823	1 074 690	7
40	35 039	1 401 560	9
50	34 289	1 714 450	11
60	33 570	2 014 200	13
70	32 880	2 301 600	14
80	32 219	2 577 520	16
90	31 583	2 842 470	18
100	30 973	3 097 300	19
200	25 953	5 190 600	32
300	22 333	6 699 900	42
400	19 600	7 840 000	49
500	17 462	8 731 000	55
600	15 745	9 447 000	59
700	14 336	10 035 200	63
800	13 158	10 526 400	66
900	12 159	10 943 100	68
1 000	11 300	11 300 000	71
2 000	6 625	13 250 000	83
3 000	4 686	14 058 000	88
4 000	3 625	14 500 000	91
5 000	2 956	14 780 000	92
6 000	2 495	14 970 000	93
7 000	2 159	15 113 000	94
8 000	1 902	15 216 000	95
9 000	1 700	15 300 000	96
10 000	1 537	15 370 000	96
11 000	1 403	15 433 000	96
12 000	1 290	15 480 000	97
13 000	1 193	15 509 000	97
14 000	1 111	15 554 000	97
15 000	1 039	15 585 000	97
16 000	975	15 600 000	97
17 000	919	15 623 000	98
18 000	869	15 642 000	98
19 000	825	15 675 000	98
20 000	784	15 680 000	98
21 000	748	15 708 000	98
22 000	714	15 708 000	98
23 000	684	15 732 000	98
24 000	656	15 744 000	98
25 000	630	15 750 000	98
26 000	606	15 756 000	98
27 000	584	15 768 000	98
28 000	563	15 764 000	98

Length of Reel: 800 m or 16,012,800 characters
 Inter-Block Gap: 417 characters
 The longest block for a GIER Computer equipped with 1 Buffer is 4096 x 7 = 28,672 characters.

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 COPENHAGEN F. · DENMARK

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