telephone to Dublin; training courses are available too, in London and Dublin and elsewhere if demand warrants it, but these are charged separately.

Conclusions

MicroScript is for me rather a curate's egg of a package — good in parts. Some sections of the software are excellent — such as the abbreviation memories, the ruler facilities, the calculator and the command processing and standard paragraph features. Some of these could have been made even better with a little more thought — the ability to carry out conditional execution, for instance, would make a big difference to the flexibility of the command processing. I didn't like the restrictions to 23 lines on paragraph work and block movement, and I didn't like the problems I had with insertion — especially the fact that 'insert mode' is turned off for you without your being told. I also disliked very much the procedures for underlining and emboldening.

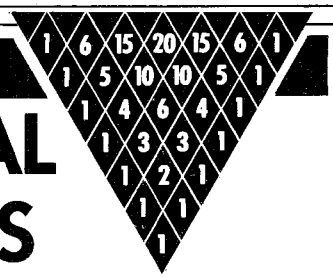
So how would these facilities work for the four archetypal users featured in these reviews? The author/journalist should find the editing adequate, though some features might not be quite to his or her taste; the fact that you get just your text on the screen would probably be a plus point, and an author would be likely to find features like the abbreviation memories invaluable — I did when writing this article. The ruler features were on the whole very good, but nevertheless the writer of technical reports might not find the formatting features adequate, especially aspects such as the lack of control over page layout. The manager might find the system a bit hard to learn, though perhaps he or she could be taught a simple subset. The secretary — well, that would depend on the application. Legal secretaries and the like would find the power of the command system invaluable (though they might like it even better with conditional execution). Other office environments would be more or less suited to MicroScript depending on factors such as the value of the calculating facilities and the abbreviation memories versus the lack of control over page layout.

All in all, for a first issue the current version of MicroScript is way ahead of the first issue of most of the existing competitors — but of course they've been around a lot longer. The CP/M word processing scene has been pretty quiet for a while in terms of new issues, but it seems that MicroScript is in the vanguard of a new wave. As a European product I wish MicroScript luck, in competition with other new products such as the American package Perfect Writer (already here) and other imports promised soon including one from Ashton Tate, the authors of dBaseII.

END

NUMBERS COUNT

TRIANGULAR, TETRAHEDRAL AND FIBONACCI NUMBERS



Mike Mudge continues his series of puzzles for the maths freaks among us.

The positive integers consist of 1, 2, 3, 4, 5...; a general number in this sequence will be noted by l, m or n.

The Triangular Numbers, denoted by T_l, represent the number of identical spheres that can be packed into a complete triangular array having l rows. Thus $T_1 = 1$, $T_2 = 1 + 2 = 3$, $T_3 = 1 + 2 + 3 = 6$, and in general $T_l = 1/2\,l(l + 1)$.

The Tetrahedral Numbers, denoted by t_m, represent the number of identical spheres that can be stacked in a complete triangular pyramid, or tetrahedron, having m layers – each a complete triangle. Thus $t_1 = T_1 = 1$, $t_2 = T_1 + T_2 = 1 + 3 = 4$, $t_3 = T_1 + T_2 + T_3 = 1 + 3 + 6 = 10$, and in general $t_m = 1/6m(m + 1)(m + 2)$.

In contrast to the above numbers, which are essentially geometrical in origin, the Fibonacci Numbers, denoted by F_n, are here defined algebraically using a recurrence relation $F_{n+1} = F_n + F_{n-1}$ where $F_1 = F_2 = 1$. That is, any term in the Fibonacci sequence is obtained as the sum of the two previous terms. Thus $\{F_n\} = \{1, 1, 2, 3, 5, 8, 13, 21, \ldots\}$; this sequence has so many interesting properties that it has its own publication, *The Fibonacci Quarterly*.

PROBLEM

This month's problem is in three distinct parts, which are seen to have a common logical thread.

a) Which tetrahedral numbers are also triangular numbers (eg, $T_1 = t_1 = 1$, $T_4 = t_3 = 10$)? This problem has been attributed to W Sierpinski, 1970, and others.

b) Which Fibonacci numbers are also triangular numbers (eg, $T_1 = F_1 = 1 = F_2$, $T_2 = F_4 = 3$, $T_6 = F_8 = 21$)? This problem is due to Vern Hoggatt.

c) Which Fibonacci numbers are half the sum or difference of the cubes of two integers – eg, $1 = 1/2(1^3 + 1^3)$, $8 = 1/2(2^3 + 2^3)$, $13 = 1/2(3^3 - 1^3)$? This is closely related to the abstract problem in number theory of finding all quadratic fields of class-number 2.

Submit a program, or suite of programs, which generates answers to the above questions up to some maximum positive integer, N, whose value may be input data. All submissions should include program listings, hardware descriptions, run times and output; they will be judged for accuracy, originality and efficiency (not necessarily in that order). A prize of £10 will be awarded to the 'best' entry received within two months of the appearance of this article.

Submissions to: Mr M R Mudge BSc, FIMA, FBCS, Room 560/A, Department of Mathematics, The University of Aston in Birmingham, Gosta Green, Birmingham B4 7ET.

Note: Submissions will be returned only if suitable stamped addressed envelopes are included.

Response to the first article in this series was predictably sparse; however, the 'best' entry has been chosen as that of Robert Merson of Farnham, who combined some subtle algebraic transformations with a factoring technique to reveal:

$428 = (-117091)^3 + (-111433)^3 + 2(114332)^3$

$491 = (13584908)^3 + (13476659)^3 + 2(-13531000)^3$

$580 = (89845)^3 + (85111)^3 + 2(-87542)^3$

A cheque for £10 will be sent to Robin.

END