Loose ends

Mike Mudge bids farewell to *PCW* and brings his column to as tidy a close as possible.

After fourteen and a half years, *Numbers Count* has come to an end. To conclude in the tidiest possible manner, I will cover a selection of responses to recent columns. All responses to last month's problem will be welcome, although no feedback will appear in *PCW*.

August 1997

Despite the errors — (1) the top row of high numbers contains only 25, 50, 75 and 100 (no 10); and (2) the target is an integer in the inclusive range 100 - 999 — a number of working programs have been received, including: a Borland C++ 3.5 version which works in Windows, from John Blyte; and a DOS program written in C, by Graem Yeandle, which is running on a 133MHz Pentium in under 2 seconds and has "found answers missed by Carol Vorderman".

July 1997

This was the most popular column, ever. Why? A variety of programs containing only two, and even one, semi-colon have been received. However, the expression of primes in the form $x^2 + ny^2$, n = 1(1) max prompted Gareth Suggett to discover that 1201 is not the smallest. 1009 and 1129 also have the same property, although these could be seen as imperfect because for one of the values of n, y = n, this does not happen for 1201. Reference: DA Cox, *Primes of the form $x^2 + dy^2$* (Wiley, 1989 — now out of print) and Beiler's *Recreations in the Theory of Numbers* (chapter XXIII).

June 1997

This brought to light a research group at Helsinki University of Technology, PO Box 1100, FIN-02015 HUT, Finland (email Kari Nurmela at kjnu@vipunen.hut.fi or Patric.Ostergard@hut.fi) which has papers pending in *Discrete Mathematics* and *Discrete & Computational Geometry*. See also, Kari J Nurmela and Patric R J Ostergard *Graph Theory, Combinatorics, Algorithms, and Applications 1996*, entitled *Optimal Packings of Equal Circles in a Square*.

A much simpler and experimental approach is being developed by Bruce Halsey using a 100MHz 486 with Turbo Pascal 7.0 and "several Pentium 133s…for some of the number crunching".

May 1997

So far, this has been unpopular. I would nevertheless welcome correspondence from any reader who has attempted to experiment in this area and perhaps decided that the results (or lack of) did not warrant a submission. Remember that a number of readers have succeeded in publishing their results in one of the learned journals, so please respond if you have anything at all in these areas, particularly relating to non-amorphic numbers.

April 1997

George Sassoon investigated the number of non-occurers in a JAMS sequence and found 95 between 40*10*9 and 50*10**9 all of which are even. He was continuing the analysis up to 10**10. Mike Bennett, as reported in the July issue, solved X(n) = 876 to obtain n = 34732165539) in 2hrs 11mins 3secs on an Acorn RISC PC with a StrongARM processor.

Nigel Backhouse obtained confirmation of this in about four and a half days in UBASIC on a Pentium 133. What does the comparison of these times tell us about the hardware, the software and the individuals?

March 1997

This set of problems produced an investigation by Eddie Clough using a freeware version of "J" on a 486DX40 (8Mb RAM). He found speed to prove a problem when identifying large numbers of large primes. How large is large? The proof that 1**2 + 2**2 + 3**2 +...+n**2 = N**2 has only two solutions (namely 2 and 24) and is provided in an accessible form by WS Anglin, *The Square Pyramid Puzzle, American Mathematical Monthly* (vol 97, pp120-124, Feb 1990). Copies on request.

February 1997

As for the general Smarandache-type mathematics, I recommend the recent publication *Surfing on the Ocean of Numbers — A Few Smarandache Notions and Similar Topics* by Henry Ibstedt (Ehrus University Press, 1997, ISBN 1-879585-57-x). The author made a substantial response to the problems S(n) n = 1(1)7. The prizewinner is Nigel Hodges.

Finale

Please submit requests for further details of solutions referred to or hinted at above, to me at the address below. I am seeking another vehicle to encourage empirical number theory research and any suggestions for reviving the concept of *Numbers Count* outside *PCW* would be welcome. One idea would be a Numbers Count Club, whereby a monthly newsletter would be posted, faxed or emailed to members. Does this have any support?

Thank you, to those readers who have communicated with me via this column over the years. Here's hoping this is *au revoir* and not goodbye.

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