LEISURE LINES

Brain-teasers courtesy of J J Clessa

Quickie

This month's quickie was submitted by Mr John Deft of Hartlepool. Nice one John.

Three full wine glasses and three empty wine glasses stand in a row as shown below. By moving only one glass, can you arrange them so that full and empty glasses alternate.

In other words:

from this 

to this 

Prize Puzzle

This month's prize puzzle should not be too difficult for those of you with micros or programmable calculators, so key-in and go.

Find a 3-digit perfect square which is the average of two other 3-digit perfect squares (numbers with leading zeros are not allowed).

Answers, on postcards only, to: *PCW* Prize Puzzle, February 1985, Leisure Lines, 62 Oxford Street, London W1. Entries to arrive not later than 28 February 1985.

October Prize Puzzle

The marathon event at Little Dingblat seemed to be more difficult than we had thought — only 70 entries were submitted — and several of these gave wrong solutions.

The winning entry came from Jonathan Jackson of Leek in Staffordshire. Congratulations, Jonathan, your prize is on its way. The solution to the problem is 23 entrants in the race.

By the way, if you have any ideas for problems that can make micros whirr (or even explode) please send them in. END

NUMBERS

Mathematical mind-benders from Mike Mudge

A palindromic number, or simply a palindrome, is a number which reads the same in either direction: for example, 121. This is a base-dependent property, since, for example, if we convert to binary 121_{10} the result is 1111001_2, which is not a palindrome.

Our problems are in three sections, the first of which could be answered by searching suitable tables. However, this would not enable progress to be made in the second part, and should only be used as a check. The third part has tested the ingenuity of many programmers, and certainly contains at least one presently unsolved element.

A) Determine the sequence of palindromic squares: for example, the fourteenth is $836^2 = 698896$. Repeat for cubes where the sixth is $111^3 = 1367631$. If you become fascinated by this problem, consider higher powers.

Determine the sequence of palindromic pentagonal numbers given by $P_n = n(3n-1)/2$; the eighth is $P_{2173} = 7081807$.

Determine the sequence of palindromic primes; the thirtieth is 13831.

B) Repeat the above calculations for various number bases. How do the palindromic fractions of each of the above type of number vary with bases?

C) The palindromic attempt function: A(n) is defined to be the integer generated when n is added to the integer obtained from n by reversing its digits:
for example, A(91) = 91 + 19 = 110.

How many times must this function be applied to a given integer before a palindrome is produced?

For 91 the answer is 2, since A(91) = 110, A(110) = 110 + 011 = 121 a palindrome. For 136 the answer is 1, since A(136) = 136 + 631 = 767 a palindrome. For 994 the answer is 3, 994.. 1493..5434..9779.

Determine the answer for all n less than, say, 200. *Particular interest centres on the number 196.*

How does the palindrome attempt function work in other (palindromic) number bases?

Readers are invited to submit their program listings, together with hardware descriptions, run times, any comments and, of course, the output relating to their selection from these problems. These will be judged for accuracy, originality and efficiency (not necessarily in that order) and a prize will be awarded to the 'best' entry received by 1 May 1985.

Please address entries to Mike Mudge, 'Square Acre', Stourbridge Road, Penn, Nr Wolverhampton, Staffordshire WV4 5NF. Tel: (0902) 892141.

Please note that submissions can only be returned if a suitable stamped addressed envelope is provided. Expanded reviews of previous 'Numbers' problems together with, subject to the approval of the contributor, copies of detailed programs from the prize winning entry may also be requested. END

MICROCHESS

Kevin O'Connell looks at Cray Blitz's outstanding performance in the North American Computer Chess Championship.

White: Cray Blitz. Black: Fidelity X. Sicilian Defence. Notes by Kevin O'Connell.

The following game was played in the first round of the 15th North American Computer Chess Championship, held in San Francisco last October.

Cray Blitz started as it meant to go on. It won the next three games as well, to win the tournament with a 100 per cent score, a whole point ahead of the competition — a huge margin in a four-round event with 14 competitors.

The game is delightful proof of the old adage that one should not try too hard to hang onto a gambit pawn.

1	e2–e4	c7–c5
2	d2–d4	c5xd4
3	Ng1–f3	e7–e5?

(Black should play 3 . . .d7–d6 with a good position.)

4	c2–c3	Qd8–a5

(4 . . .d4xc3 5 Nblxc3 Nb8–c6 6 Bfl–c4 leaves White with some advantage but is the normal line here.

The text seems to be a completely new move in this position — not too surprising really since it has nothing to commend it.)

5	Qdl–b3	

(A slightly curious move, probably not the best, which, however, brings White a rich reward.

5	. . .	f7–f6?

(When I was at school, some friends of mine liked to play 'losing chess', the object of which was to force the opponent to win the game. This weakening of the light squares brings those schoolday memories flooding back.)