1. Intro. Counting the number of distinct positions in all games of tic-tac-toe.

```
#include <stdio.h>
  char pos[1 ≪ 18];
  int move[9], count[9], nonwin[9];
  int win[16] = {#15000, #00540, #00015, #10410, #04104, #01041, #10101, #01110};
  main( )
  {
    register k, l, board;
    for (k = 0; k < 8; k++) win[k + 8] = win[k] ≪ 1;
    l = board = 0;
  newlev: move[l] = 3;
  tryit:
    if (¬(board & move[l])) {
      board += move[l] & (l & 1 ? #55555 : #aaaaa);
      if (pos[board]) goto unmove;
      pos[board] = 1, count[l]++;
      for (k = 0; k < 16; k++)
        if ((board & win[k]) ≡ win[k]) goto unmove;
      nonwin[l]++;
      if (l ≡ 8) goto unmove;
      l++;
      goto newlev;
    }
  tryagain: move[l] ≪= 2;
    if (move[l] < (1 ≪ 18)) goto tryit;
    if (l > 0) {
      l−−;
    unmove: board &= ∼move[l];
      goto tryagain;
    }
    for (k = 0; k ≤ 8; k++) printf("(%d,%d)␣at␣level␣%d\n", count[k], count[k] − nonwin[k], k);
  }
```

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TICTACTOE0