1. Intro. This little program makes empirical tests by which I can check the accuracy of the SETSET program. (See that program for explanations.)

```
#define m 12     /∗ size of each hand ∗/
#define n 100000000     /∗ number of random trials ∗/

#include <stdio.h>
#include "gb_flip.h"     /∗ use the Stanford GraphBase random number routines ∗/
  char deck[81];
  char occ[81];
  char z[3][3] = {{0, 2, 1}, {2, 1, 0}, {1, 0, 2}};     /∗ x + y + z ≡ 0 (mod 3) ∗/
  char third[81][128];

  main( )
  {
    register int j, k, t;
    int reps, count;

    ⟨ Initialize 2 ⟩;
    while (1) {
      count = 0;
      for (reps = 0; reps < n; reps++) {
        ⟨ Shuffle the deck 4 ⟩;
        ⟨ Increase count if there are no SETs 3 ⟩;
      }
      printf("%d/%d\n", count, n);
    }
  }
```

2. `#define pack(a, b, c, d) (((a) ∗ 3 + (b)) ∗ 3 + (c)) ∗ 3 + (d)`

```
⟨ Initialize 2 ⟩ ≡
  gb_init_rand(0);
  for (k = 0; k < 81; k++) deck[k] = k;
  for (k = 81 − m; k < 81; k++) occ[k] = 1;
  {
    int a, b, c, d, e, f, g, h;

    for (a = 0; a < 3; a++)
      for (b = 0; b < 3; b++)
        for (c = 0; c < 3; c++)
          for (d = 0; d < 3; d++)
            for (e = 0; e < 3; e++)
              for (f = 0; f < 3; f++)
                for (g = 0; g < 3; g++)
                  for (h = 0; h < 3; h++)
                    third[pack(a, b, c, d)][pack(e, f, g, h)] = pack(z[a][e], z[b][f], z[c][g], z[d][h]);
  }
```

This code is used in section 1.

3. ⟨ Increase *count* if there are no SETs 3 ⟩ ≡

```
  for (j = 81 − m; j < 80; j++)
    for (k = j + 1; k < 81; k++)
      if (occ[third[deck[j]][deck[k]]]) goto set_found;
  count++;
set_found:
```

This code is used in section 1.

4. ⟨ Shuffle the deck 4 ⟩ ≡

```
  for (j = 81; j > 81 − m; j−−) {
    t = deck[j − 1];
    occ[t] = 0;
    k = gb_unif_rand(j);
    deck[j − 1] = deck[k];
    occ[deck[k]] = 1;
    deck[k] = t;
  }
```

This code is used in section 1.

5. Index.

⟨ Increase *count* if there are no SETs 3 ⟩ Used in section 1.
⟨ Initialize 2 ⟩ Used in section 1.
⟨ Shuffle the deck 4 ⟩ Used in section 1.

SETSET-RANDOM