## CS 1713, Craps Simulation, Thu Mar 05 1998

```
runner% cat craps.c
/* craps.c: gather statistics about playing the
 *   game of craps.  Uses time() to initialize the
 *   random number generator.  Exact answers
 *   should be 49.28% and 50.71%
 *   In casino craps, for a bet that a loss will occur
 *   (don't pass), an initial roll of 12 still
 *   loses for the pass better, but neither wins
 *   nor loses for the don't pass better.  Now
 *   the chance of winning with a bet on "don't
 *   pass" becomes 49.28% also, the same as "pass".
 * Written by NR Wagner, March 7, 1996
 */
#include <stdio.h>
#include <stdlib.h>
#include <time.h>
#define MAXR 1000000
#define WIN 1
#define LOSE 0

int die(void);
int roll(void);
int craps(void);

void main(void)
{
        int i;
        int wins = 0, loses = 0;
        srand48((long)time(NULL));
        printf("Total rolls: %1d\n", MAXR);
        for (i = 0; i < MAXR; i++) {
                if (craps() == WIN)
                        wins++;
                else
                        loses++;
        }
        printf("Wins:%.4f%%, Loses:%.4f%%\n",
                100.0*wins/MAXR, 100.0*loses/MAXR);
}

/* die: simulate rolling one die */
int die(void)
{
        return (int)(6.0*drand48() + 1.0);
}

/* roll: simulate rolling two dice */
int roll(void)
{
        return die() + die();
}

/* craps: play one game of craps */
int craps(void)
{
        int r;
        int point;
        r = roll();
        if (r == 2 || r == 3 || r == 12)
                return LOSE;
        if (r == 7 || r == 11)
                return WIN;
        point = r;
        for (;;) {
                r = roll();
                if (r == point)
                        return WIN;
                if (r == 7)
                        return LOSE;
        }
}

runner% lint -m -u craps.c

function returns value which is always ignored
    printf

runner% cc -o craps craps.c
runner% craps
Total rolls: 1000000
Wins:49.3299%, Loses:50.6701%
runner% craps
Total rolls: 1000000
Wins:49.3481%, Loses:50.6519%
runner% craps
Total rolls: 1000000
Wins:49.2406%, Loses:50.7594%
runner% craps
Total rolls: 1000000
Wins:49.3314%, Loses:50.6686%
runner% craps
Total rolls: 50000000
Wins:49.2771%, Loses:50.7229%
```