CS 1723, Static and Auto Storage, Illustrated with counters of function calls, Mon Aug 31 1998

```
vip% cat count.c
/* count.c: counters--global, static,
   and local passed by reference.
   Program written by NR Wagner, Jan 10 97 */
#include <stdio.h>
#define TH(i) (i)/10%10 == 1 ? "th" :\
              (i)%10    == 1 ? "st" :\
              (i)%10    == 2 ? "nd" :\
              (i)%10    == 3 ? "rd" : "th"
void f0(void);
void f1(void);
void f2(void);
void f3(int *counter3);

int counter1 = 0; /* global counter */

void main(void)
{
   int counter3 = 0; /* local counter,
                        passed by ref */
   int i;
   for (i = 1; i < 205; i++) {
      f0(); f1(); f2(); f3(&counter3);
   }
}

void f0(void)
{
   int counter0 = 0; /* auto local counter */
                     /* DOESN'T WORK! */
   counter0++;
   (void)fprintf(stdout, "%3d%s time f0 called\n",
      counter0, TH(counter0));
}

void f1(void)
{
   counter1++; /* global counter */
   (void)fprintf(stdout, "%3d%s time f1 called\n",
      counter1, TH(counter1));
}

void f2(void)
{
   static int counter2 = 0; /* static local
                               counter */
   counter2++;
   (void)fprintf(stdout, "%3d%s time f2 called\n",
      counter2, TH(counter2));
}

void f3(int *counter3)
{
   (*counter3)++; /* global counter */
   (void)fprintf(stdout, "%3d%s time f3 called\n",
      *counter3, TH(*counter3));
}

vip% lint -m -u count.c
vip% cc -o count count.c
vip% count
  1st time f0 called
  1st time f1 called
  1st time f2 called
  1st time f3 called
  1st time f0 called
  2nd time f1 called
  2nd time f2 called
  2nd time f3 called
  1st time f0 called
  3rd time f1 called
  3rd time f2 called
  3rd time f3 called
  1st time f0 called
  4th time f1 called
  4th time f2 called
  4th time f3 called
  ...
 11st time f1 called
 11th time f1 called
 12th time f1 called
 13th time f1 called
 ...
 21st time f1 called
 21st time f1 called
 22nd time f1 called
 23rd time f1 called
 24th time f1 called
101st time f1 called
101st time f1 called
102nd time f1 called
103rd time f1 called
104th time f1 called
111th time f1 called
121st time f1 called
121st time f1 called
122nd time f1 called
```