```c
 1  #include "fifo.h"
 2
 3  void fifo_init(struct fifo *f)
 4  {
 5      f->next_read = 0;
 6      f->next_write = 0;
 7      sem_init(&f->empty, MYFIFO_BUFSIZ);
 8      sem_init(&f->full, 0);
 9      sem_init(&f->mutex, 1);
10  }
11
12  void fifo_wr(struct fifo *f, unsigned long d)
13  {
14      for (;;)
15      {
16          sem_wait(&f->empty);
17
18          if (sem_try(&f->mutex))
19          {
20              f->buffer[f->next_write] = d;
21              f->next_write = (f->next_write + 1) % MYFIFO_BUFSIZ;
22              sem_inc(&f->mutex);
23              sem_inc(&f->full);
24              break;
25          }
26          else
27          {
28              sem_inc(&f->empty);
29          }
30      }
31  }
32
33  unsigned long fifo_rd(struct fifo *f)
34  {
35      unsigned long d;
36      for (;;)
37      {
38          sem_wait(&f->full);
39          if (sem_try(&f->mutex))
40          {
41              d = f->buffer[f->next_read];
42              f->next_read = (f->next_read + 1) % MYFIFO_BUFSIZ;
43              sem_inc(&f->mutex);
44              sem_inc(&f->empty);
45              break;
46          }
47          else
48          {
49              sem_inc(&f->full);
50          }
```

```
50        }
51    }
52    return d;
53 }
```