

```
//PRODUCER COMSUMER PROBLEM
```

```
#include <stdio.h>
#include <stdlib.h>
#include <pthread.h>
```

```
#define BUFFER_SIZE 20
#define MAX_ITEMS 20
```

```
int buffer[BUFFER_SIZE];
int in = 0;
int out = 0;
int produced_count = 0;
int consumed_count = 0;
```

```
pthread_mutex_t mutex;
pthread_cond_t full;
pthread_cond_t empty;
```

```
void* producer(void* arg) {
    int item = 1;

    while (produced_count < MAX_ITEMS) {
        pthread_mutex_lock(&mutex);

        while (((in + 1) % BUFFER_SIZE) == out) {
            pthread_cond_wait(&empty, &mutex);
        }

        buffer[in] = item;
        printf("\nProduced: %d", item);
        item++;
        in = (in + 1) % BUFFER_SIZE;

        produced_count++;

        pthread_cond_signal(&full);
        pthread_mutex_unlock(&mutex);
    }

    pthread_exit(NULL);
}
```

```
void* consumer(void* arg) {
    while (consumed_count < MAX_ITEMS) {
        pthread_mutex_lock(&mutex);

        while (in == out) {
            pthread_cond_wait(&full, &mutex);
        }

        int item = buffer[out];
```

```

    printf("\nConsumed: %d", item);
    printf("\n");
    out = (out + 1) % BUFFER_SIZE;

    consumed_count++;

    pthread_cond_signal(&empty);
    pthread_mutex_unlock(&mutex);
}

pthread_exit(NULL);
}

int main() {
    pthread_t producerThread, consumerThread;

    pthread_mutex_init(&mutex, NULL);
    pthread_cond_init(&full, NULL);
    pthread_cond_init(&empty, NULL);

    pthread_create(&producerThread, NULL, producer, NULL);
    pthread_create(&consumerThread, NULL, consumer, NULL);

    pthread_join(producerThread, NULL);
    pthread_join(consumerThread, NULL);

    pthread_mutex_destroy(&mutex);
    pthread_cond_destroy(&full);
    pthread_cond_destroy(&empty);

    return 0;
}

```

OUTPUT

```

avcoe@avcoe-HP-ProDesk-400-G1-SFF:~$ gcc prod-consum.c -lpthread
avcoe@avcoe-HP-ProDesk-400-G1-SFF:~$ ./a.out

```

```

Produced: 1
Produced: 2
Produced: 3
Produced: 4
Produced: 5
Produced: 6
Produced: 7
Produced: 8
Produced: 9
Produced: 10
Produced: 11
Produced: 12
Produced: 13
Produced: 14

```

Produced: 15
Produced: 16
Produced: 17
Produced: 18
Produced: 19
Consumed: 1

Consumed: 2

Consumed: 3

Consumed: 4

Consumed: 5

Consumed: 6

Consumed: 7

Consumed: 8

Consumed: 9

Consumed: 10

Consumed: 11

Consumed: 12

Consumed: 13

Consumed: 14

Produced: 20

Consumed: 15

Consumed: 16

Consumed: 17

Consumed: 18

Consumed: 19

Consumed: 20