(Bad) Producer Consumer **using a lock**

- The producer might write into a full buffer
- The consumer might read from an empty buffer

```
void producer () {
  while(1){
     item := produce()
     acquire(lock)
     write(buffer, item)
     release(lock)
  }
}
```

```
void consumer () {
  while(1){
     acquire(lock)
     item := read(buffer)
     release(lock)
     consume(item)
  }
}
```

```
lock := init()
```

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  while(1){
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     item := read(buffer)
     release(lock)
     consume(item)
  }
}
```

- The producer might write into a full buffer
- The consumer might read from an empty buffer

(Good) Producer consumer **using a lock**

```
lock := init()
```

```
void producer () {
  while(1){
     item := produce()
     acquire(lock)
     while(full(buffer)){
          release(lock)
          yield();
          acquire(lock)
     }
     write(buffer, item)
     release(lock)
  }
}
```

```
void consumer () {
  while(1){
     acquire(lock)
     while(emtpy(buffer)){
          release(lock)
          yield();
          acquire(lock)
     }
     item := read(buffer)
     release(lock)
     consume(item)
  }
}
```