

# Too Much Milk

## Roommate A

- 3:00** Arrive home: no milk
- 3:05** Leave for store
- 3:10** Arrive at store
- 3:15** Leave store
- 3:20** Arrive home, put milk away
- 3:25**
- 3:30**

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## Roommate B

- Arrive home: no milk
- Leave for store
- Arrive at store
- Leave store
- Arrive home: **too much milk!**

# Computerized Milk Purchase

```
1 if (milk == 0) {  
2     if (note == 0) {  
3         note = 1;  
4         buy_milk();  
5         note = 0;  
6     }  
7 }
```

# Still Too Much Milk

## Thread A:

```
1  if (milk == 0) {
2      if (note == 0) {
3
4
5
6
7
8
9
10     note = 1;
11     buy_milk();
12     note = 0;
13 }
14 }
```

## Thread B:

```
if (milk == 0) {
    if (note == 0) {
        note = 1;
        buy_milk();
        note = 0;
    }
}
```

# Second Attempt

## Thread A:

```
1  if (note == 0) {
2    if (milk == 0) {
3      buy_milk();
4    }
5    note = 1;
6  }
```

## Thread B:

```
1  if (note == 1) {
2    if (milk == 0) {
3      buy_milk();
4    }
5    note = 0;
6  }
```

# Third Attempt

## Thread A:

```
1  noteA = 1;
2  if (noteB == 0) {
3      if (milk == 0) {
4          buy_milk();
5      }
6  }
7  noteA = 0;
```

## Thread B:

```
1  noteB = 1;
2  if (noteA == 0) {
3      if (milk == 0) {
4          buy_milk();
5      }
6  }
7  noteB = 0;
```

# Fourth Attempt

## Thread A:

```
1  noteA = 1;
2  if (noteB == 0) {
3      if (milk == 0) {
4          buy_milk();
5      }
6  }
7  noteA = 0;
```

## Thread B:

```
1  noteB = 1;
2  while (noteA == 1) {
3      // do nothing
4  }
5  if (milk == 0) {
6      buy_milk();
7  }
8  noteB = 0;
```

