

Monitors and One-Way Bridges -- **!!non-exclusion!!**

```
monitor Bridge {  
    cond northbound, southbound; // conds are waiting  
    stations  
    int northOnBridge, southOnBridge;  
    procedure enterSouthbound() {  
        if (northOnBridge>0) wait(southbound);  
        southOnBridge++;  
    }  
    procedure leaveSouthbound() {  
        southOnBridge--;  
        if (southOnBridge==0)  
            signal_all(northbound);  
    }  
    // + northbound versions  
    // note: the bridge crossing is not in monitor  
}
```

Monitors and One-Way Bridges -- **!!impolite!!**

```
monitor Bridge {  
    cond northbound, southbound;  
    int northOnBridge, southOnBridge;  
    procedure enterSouthbound() {  
        while (northOnBridge>0) wait(southbound);  
        southOnBridge++;  
    }  
    procedure leaveSouthbound() {  
        southOnBridge--;  
        if (southOnBridge==0)  
            signal_all(northbound);  
    }  
    // + northbound versions  
    // note: the bridge crossing is not in monitor  
}
```

Monitors and One-Way Bridges -- !!too polite -- deadlock!!

```
monitor Bridge {
    cond northbound, southbound;
    int northOnBridge, southOnBridge;
    procedure enterSouthbound() {
        if ((northOnBridge>0) || !empty(northbound))
            wait(southbound);
        southOnBridge++;
    }
    procedure leaveSouthbound() {
        southOnBridge--;
        if (southOnBridge==0)
            signal_all(northbound);
    }
    // + northbound versions
    // note: the bridge crossing is not in monitor
}
```

Monitors and One-Way Bridges -- ??just right??

```
monitor Bridge {
    cond northbound, southbound;
    int northOnBridge, southOnBridge;
    procedure enterSouthbound() {
        while ((northOnBridge>0) ||
            ((southOnBridge>0) &&
            !empty(northbound))) wait(southbound);
        southOnBridge++;
    }
    procedure leaveSouthbound() {
        southOnBridge--;
        if (southOnBridge==0)
            signal_all(northbound);
    }
    // + northbound versions
    // note: the bridge crossing is not in monitor
}
```

Monitors and One-Way Bridges -- ??better??

```
monitor Bridge {
    cond northbound, southbound;
    int northOnBridge, southOnBridge;
    procedure enterSouthbound() {
        if ((northOnBridge>0) || !empty(northbound))
            wait(southbound);
        while (northOnBridge>0) wait(southbound);
        southOnBridge++;
    }
    procedure leaveSouthbound() {
        southOnBridge--;
        if (southOnBridge==0)
            signal_all(northbound);
    }
    // + northbound versions
    // note: the bridge crossing is not in monitor
}
```