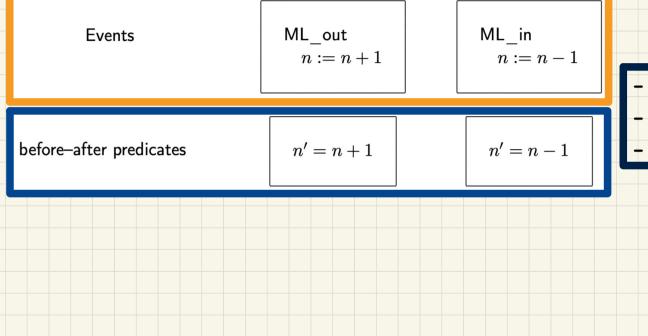
## Before-After Predicates of Event Actions



- Pre-State
- Post-State
- Sate Transition

## Exercise: Event Actions vs. Before-After Predicates

Q. Are the following event actions suitable for a swap between x and y?

```
swap
begin
    temp := x
    x := y
    y := temp
end
```

## Design of Events: Invariant Preservation

variables: n

ML\_out **begin**  n := n + 1**end**  ML\_in **begin** n := n - 1 **end** 

invariants: inv0\_1 :  $n \in \mathbb{N}$ 

**inv0**\_2 :  $n \le d$ 

Sequents: Syntax and Semantics

Syntax

$$H \vdash G$$
 $G$ 

**Semantics** 

Q. What does it mean when H is empty/absent?

## PO/VC Rule of Invariant Preservation

constants: dvariables: n n:=n+1 endaxioms:  $axm0\_1: d \in \mathbb{N}$ inv0\\_1:  $n \in \mathbb{N}$   $inv0\_2: n \le d$ ML\_out
begin n:=n+1 endML\_in
begin n:=n-1 end

Axioms

Invariants Satisfied at Pre-State
Guards of the Event

Invariants Satisfied at Post-State