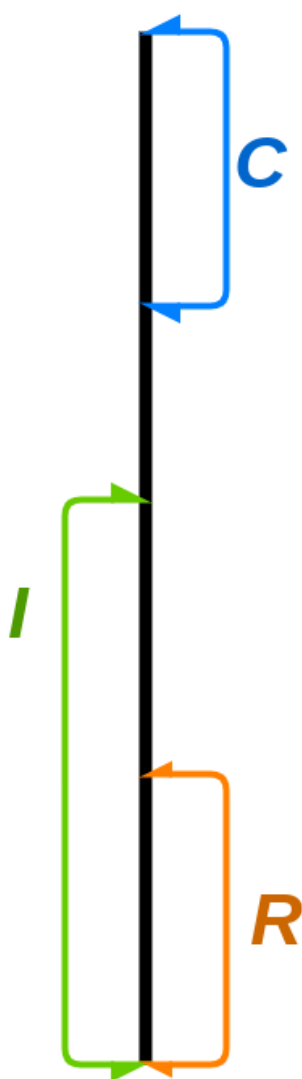


# Definitions

- **C** - stands for cancelation(void)-related terms
- **I** - stands for invoice(capture)-related terms
- **R** - stands for refund(creditmemo)-related terms

The (placed) **ORDER**



- **CI** stands for not canceled and not invoiced part of the order
  - $CI = O - C - I$
- **IR** stands for invoiced and not refunded part of the order
  - $IR = I - R$
- **CR** stands for not canceled and not refunded part of the order
  - $CR = O - C - R = CI + IR$

## Invariants

$$IR \geq 0$$

can not refund what was not invoiced

$$CI \geq 0$$

can not cancel what was invoiced,  
can not invoice what was canceled

# The (expected) **Cart**

IR (vs C + R)

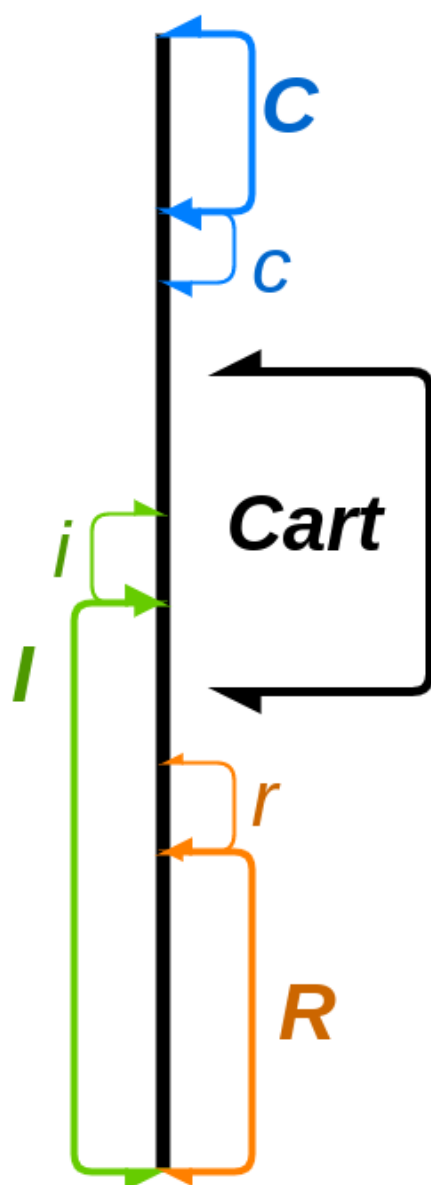
(IR = 0)  $0 \leq \text{Cart} \leq \text{CR}$  (CI = 0)

**c** - new cancelation

**i** - new invoice

**r** - new refund

## The (placed) **ORDER**



### **Invoice**

invariant:  $i \leq \text{CI}$

$$\text{Cart} = \text{IR} + i = \text{CR} - (\text{CI} - i) \leq \text{CR}$$

### **Cancellation**

invariant:  $c \leq \text{CI}$

$$\text{Cart} = \text{CR} - c = \text{IR} + (\text{CI} - c) \geq \text{IR}$$

### **Refund**

invariant:  $r \leq \text{IR}$

$$\text{Cart} = \text{CR} - r = \text{CI} + (\text{IR} - r) \geq \text{CI}$$

# Sales: Discounts, Promotions, Coupons, etc

- **ST()** - Subtotal of the Cart/ORDER
  - sum of totals of the items: **ST(Cart)**, **ST(ORDER)**
- **T()** - Total of the Cart/ORDER
  - real (discounted) amount (excluding shipping): **T(Cart)**, **T(ORDER)**

Without the knowledge of **T(Cart)**: compromise fair strategy of spreading discounts, promotions, coupons

$$\text{ST(Cart)} / \text{ST(ORDER)} = \mathbf{T(Cart)} / \text{T(ORDER)}$$

$$\mathbf{T(Cart)} = \text{T(ORDER)} * \text{ST(Cart)} / \text{ST(ORDER)}$$

The (expected) Cart calculations:

- **T(i)** = T(Cart) - T(IR)
- **T(c)** = T(CR) - T(Cart)
- **T(r)** = T(CR) - T(Cart)

# Interfaces: Total, Shipping, Items, ItemTotal, Qty

qty - stands for quantity



Total



Shipping



slicing



Items



Total



Qty

