Designing an online shop

Group 2
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Overview

Problem Statement

- Discrete Dynamical System
- Abstract Data Type (ADT)
- Z Notation

Designing States

Item

$id : ID$
$amt : \mathbb{N}$
$where : WHouses \to \mathbb{N}$
$category : Cat$
$pop : \mathbb{N}$
$rating : 1 \mid 2 \mid 3 \mid 4 \mid 5$
$costprice : Price$
$sellingprice : Price$

$amt = \sum_{x \in WHouses} where(x)$

Designing States

Customer

$p : Personal$
$f : Financial$
$h : History$
$b : Purchases$
$r : Returns$

$b \subseteq h$

$$\begin{pmatrix} (d, E) \in r \\ e \in E \end{pmatrix} \Rightarrow \exists\, d_1 : Date, \exists\, F \in \mathbb{P} I \begin{pmatrix} d_1 \leq d \\ e \in F \\ (d_1, F) \in b \end{pmatrix}$$

Personal

$id : ID$
$name : String$
$nickname : String$
$dob : Date$
$gender : M \mid F \mid X$
$address : Addr$
$contact : Phone$
$email : Email$
$trust : 0 \mid 1 \mid 2 \mid 3$

Designing States

Financial

$cname : String$
$ctype : V \mid M \mid Amex$
$cnumber : \mathbb{D}^{16}$
$cvv : \mathbb{D}^{3}$
$exp : Date$

Returns

$Date \rightarrow \text{bag } Item$

Designing Operations

Buy

$\Delta State$

$cid? : ID$

$d? : Date$

$b? : I \pfun \mathbb{N}^+$

$s! : Price$

$x : I$

$\exists\, c : C$

$c.p.id = cid?$

$c'.b = c.b \cup \{(d?, b?)\}$

$c'.h.browse = c.h.browse \cup \{(d?, b?)\}$

$c'.h.wishes = c.h.wishes$

$c'.h.cats = c.h.cats \cup \{\, x.category \mid x \in b?\}$

$x'.pop = x.pop + \sum_{x \in dom(b?)} b?(x)$

$x'.amt = x.amt - \sum_{x \in dom(b?)} b?(x)$

$(\#c.p \geq 3) \Rightarrow (CPay \lor CoDpay)$

$(\#c.p < 3) \Rightarrow CPay$

$s! = \sum_{i \in dom(b?)} Price(i) \times b?(i)$

Designing Operations

Advertise

$\Xi State$

$cid? : ID$

$d? : Date$

$itw : \mathbb{P} I$

$itp : \mathbb{P} I$

$x : I$

$z! : \mathbb{P} I$

$\exists\, c : C$

$c.p.id = cid?$

$(c.h.wishes)(d?) = itw$

$[d? - \text{"}1month\text{"}, d?] \lhd (c.h.browse) = itp$

$z! = popular(\{x.cat \mid x \in itp\} \cup popular(\{x.cat \mid x \in itw\})$

Final Considerations