State diagram with states: Empty, In Cart, Confirmation, Transaction Completion.

Transitions:
- Add Item (Empty → In Cart)
- Remove Item (In Cart → Empty)
- Finish Shopping (In Cart → Confirmation)
- Continue Shopping (Confirmation → In Cart)
- Finalize Order (Confirmation → Transaction Completion)

Name   Address   Payment Details   Name   Quantity

Customer   Orders   Product

Generates

Order   ID   Time Stamp

```
            GUI                  Game              Game
                                 Logic             Logic

              │                    │                 │
              ▼                    ▼                 ▼
Player     ┌──────────────┐   ┌─────────────┐   ┌──────────────┐
Input  ──▶ │   Player     │──▶│ Parse Input │──▶│    Update     │
           │   Command    │   │             │   │   Gamestate   │
           └──────────────┘   └─────────────┘   └──────────────┘

                              ◀───────────────────────

                                    Update
                                     GUI
```

```
                                    ┌─────────────┐
                                    │    Start    │
                                    └──────┬──────┘
                                           │
                                           ▼
                                    ┌─────────────┐
                                    │ Player Turn │
                                    └──────┬──────┘
                                           │
                                           ▼
                                    ┌─────────────┐
                                    │ Player Input │
                                    └──────┬──────┘
                                           │
                                           ▼
        ┌──────────┐              ◇─────────────────◇
        │   True   │              │   Game Logic    │
        └──────────┘              │  (Valid Move)   │
     ┌──────────────┐             ◇────────┬────────◇
     │    Update    │──────────────────────┘
     │  GameState   │                      │    ┌───────┐
     └──────┬───────┘                      │    │ False │
            │                              │    └───────┘
            │                              ▼
            │                      ┌───────────────┐
            │                      │ Return Invalid│
            │                      │    Message    │
            │                      └───────┬───────┘
            ▼                              │
   ┌────────────────┐                      │
   │   Update GUI   │──────────────────────┘
   └────────────────┘
```

Start

Player Turn

Player Input

Game Logic (Valid Move)

True

Update GameState

False

Return Invalid Message

Update GUI

Example: Banking System

WithdrawMoney

ΔBankAccount
dollarAmount? : $\mathbb{N}$
centAmount? : $\mathbb{N}$

---

dollarAmount? ≤ dollars
dollarAmount? = dollars ⇒ centAmount? ≤ cents
centAmount? > cents
  ⇒ (dollars' = dollars − dollarAmount? − 1
     ∧ cents'   = cents − centAmount? + 100)
centAmount? ≤ cents
  ⇒ (dollars' = dollars − dollarAmount?
     ∧ cents'   = cents − centAmount?   )