**Medication supply game**

**Players**

1. Drug manufacturer

2. Drug wholesaler

3. Pharmacy

4. Care home

**Objective**

All four players are part of a medication supply chain, leading from a drug manufacturer (Player 1) to a care home (Player 4). The objective of the game is to maintain a sufficient supply of medicine for the care home patients while minimising the amount of surplus medication held by each player.

**Gameplay**

*Player interactions*

The game proceeds through successive rounds, each representing a week in real-time. During a round, each player sees the following values in respect to their own position only:

* Stock level (A), which is the sum of:
  + Units left over from the last week (A1)
  + Newly-arrived units this week (A2)
* Stock to arrive next week (B)
* Orders to be fulfilled from the stock (C), which is the sum of:
  + Any unfulfilled orders from the previous week (C1), plus
  + New orders received this week (C2)

Each player responds to these values by inputting a value D, which is the number of units to order for replacement stock (D). The round ends when D has been input for each player.

*Game mechanics*

At the start of the game, the initial values are as follows:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Player** | **A1** | **A2** | **B** | **C1** | **C2** |
| 1 (Manufacturer) | 12 | 4 | 4 | 4 | 4 |
| 2 (Wholesaler) | 12 | 4 | 4 | 4 | 4 |
| 3 (Pharmacy) | 12 | 4 | 4 | 4 | 4 |
| 4 (Care home) | 12 | 4 | 4 | 4 | 4 |

After all D values have been input, the following operations are applied to set the values for the next round:

|  |  |
| --- | --- |
| **Task** | **Operations** |
| Advance stock | For each player:  A = A1 + A2  For the care home:  A2 = B  For the pharmacy:  A2 = B  For the wholesaler:  A2 = B  For the manufacturer:  A2 = B |
| Fulfil orders and calculate surplus and owed medicines | For the care home:  C = C1 + C2  If A >= C  A= A – C  C1 = 0  Else  C1 = Absolute value of A – C  A = 0  For the pharmacy:  C = C1 + C2  If A >= C  B(Care home) = C  A= A – C  C1 = 0  Else  B(Care home) = C – A  C1 = Absolute value of A – C  A = 0  For the wholesaler:  C = C1 + C2  If A >= C  B(Pharmacy) = C  A= A – C  C1 = 0  Else  B(Pharmacy) = C – A  C1 = Absolute value of A – C  A = 0  For the manufacturer:  C = C1 + C2  If A >= C  B(Wholesaler) = C  A= A – C  C1 = 0  Else  B(Wholesaler) = C – A  C1 = Absolute value of A – C  A = 0 |
| Elicit new orders | For each player:  Display values A1, A2, B, C1 and C2  If (Week number < 4)  Advise player to input 4  Until D = 4  Prompt D  If D <> 4  Advise player to input 4    Else  Advise player to input 0 or a positive number  Until D => 0  Prompt D  If D < 0  Advise player to input 0 or a positive number |
| Advance orders | For the care home:  If Week number < 4  C2 = 4  Else  C2 = 8  For the pharmacy:  C2 = D(Care home)  For the wholesaler:  C2 = D(Pharmacy)  For the manufacturer:  C2 = D(Wholesaler) |
| Advance week number | Week number = Week number + 1 |

The game ends when Week number reaches 36.