Assumptions

* Each item has its own ID, which is scannable using a barcode scanner
* Tax is 8.25% for every item
* Card numbers are always 16 digits long
* PINs are always 4 digits long
* The 0’s at the beginning of the card numbers and PINs are omitted, e.g.,

PIN "0001" is represented as "1"

* Cards are identified as credit cards if their first digit starts with 5-9
* Cards are identified as debit cards if their first digit starts with 0-4
* If the card is automatically recognized as a debit card, the customer is asked to confirm if the card is a debit card
* Only $1, $5, $10, $20, $50, $100 bills are used
* Only pennies, nickels, dimes, and quarters are used
* Cash dispensers start with 10 of every kind of expected bill and coin
* Newly stocked items are already assigned an ID
* There are four error codes sent by the authorization service center (represented by negative integers): "insufficient funds" (-1), "bad PIN number" (-2), "card not recognized" (-3), and "deactivated/expired cards" (-4)
* The authorization service center sends 8-digit positive integers which represent

authorization numbers to indicate authorization success

* Credit and debit card expiration dates and security codes are sent along with their numbers, and are always expected to be correct
* Discounts for items are represented in percentage format, e.g., 0.10 is a 10% discount and

-0.30 is a 30% price hike

* The network connection between clients and servers will be 100% reliable, and neither will

ever need to be restarted

* The database, output devices, and input devices will be 100% reliable.
* At least two items are in database: ‘tomato juice’ with ID#1, and ‘vodka’ with ID#2.