

Applications Programming

Lab - Lists

The process:

1. Read and analyse the specification.
2. Code the classes and fields
3. Code the constructors
4. Code each goal as a procedure, supported by helper functions where appropriate.
5. Submit your project to PLATE after each coding step, and code in the order PLATE tests to receive marks.

Tutor demo

Main class: [Customer](#)

A customer has a savings account and a loan account. Each account has a type (savings/loan) and a balance. The initial balance is read from the user. The customer menu provides the following options:

1. deposit into the selected account
2. withdraw from the savings account
3. transfer money from the savings account into the loan account
4. view the balance of the selected account
5. exit

Sample I/O

```
Initial Savings balance: $1000
Initial Loan balance: $-50000
Customer menu (d/w/t/s/x): d
Account type: Savings
Amount to deposit: $50
Customer menu (d/w/t/s/x): v
Account type: Savings
Savings account has $1,050.00
Customer menu (d/w/t/s/x): w
Amount to withdraw: $1
Customer menu (d/w/t/s/x): v
Account type: Savings
Savings account has $1,049.00
Customer menu (d/w/t/s/x): t
Amount to transfer: $1
Customer menu (d/w/t/s/x): v
Account type: Savings
Savings account has $1,048.00
Customer menu (d/w/t/s/x): v
Account type: Loan
Loan account has $-49,999.00
Customer menu (d/w/t/s/x): d
Account type: Credit
No such account
Customer menu (d/w/t/s/x): x
```

The dollar sign is part of the read prompt. This makes negative dollar amounts look strange, but this is for simplicity's sake.

Your tutor will code the solution.

Student Specification

Main class: [Store](#)

A store sells a number of products. The initial stock is shown below::

Name	Stock	Price
Whiteboard Marker	85	\$1.50
Whiteboard Eraser	45	\$5.00
Black Pen	100	\$1.50
Red Pen	100	\$1.50
Blue Pen	100	\$1.50

The store has a cash register which stores all cash from sales of the store's product. The store clerk uses the following menu:

1. sell
2. restock
3. view stock
4. view cash
5. prune products
6. exit

The "prune products" option removes all products with zero stock from the store.

Sample I/O:

```
Choice (s/r/v/c/p/x): v
Whiteboard Marker - 85 at $1.50
Whiteboard Eraser - 45 at $5.00
Black Pen - 100 at $1.50
Red Pen - 100 at $1.50
Blue Pen - 100 at $1.50
Choice (s/r/v/c/p/x): s
Name: Whiteboard Eraser
Selling Whiteboard Eraser
Number: 46
Not enough stock
Choice (s/r/v/c/p/x): s
Name: Whiteboard Eraser
Selling Whiteboard Eraser
Number: 45
Choice (s/r/v/c/p/x): s
Name: Red Pen
Selling Red Pen
Number: 100
Choice (s/r/v/c/p/x): v
Whiteboard Marker - 85 at $1.50
Whiteboard Eraser - 0 at $5.00
Black Pen - 100 at $1.50
Red Pen - 0 at $1.50
Blue Pen - 100 at $1.50
Choice (s/r/v/c/p/x): p
Choice (s/r/v/c/p/x): r
Name: Blue Pen
Restocking Blue Pen
Number: 5
Choice (s/r/v/c/p/x): v
Whiteboard Marker - 85 at $1.50
Black Pen - 100 at $1.50
```

```
Blue Pen - 105 at $1.50
Choice (s/r/v/c/p/x): s
Name: Pie
No such product
Choice (s/r/v/c/p/x): c
Cash: $375.00
Choice (s/r/v/c/p/x): x
```

In addition to the basic functionality above, your program should also satisfy the following requirements:

- The "sell" option prints an error if the selected product is not found.
- The "sell" option ignores the case of the product name (e.g. bLaCk pEn).
- The "sell" option allows the product name to be partially entered. e.g. Entering "red" will sell a "Red Pen". Entering "pen" will instead show a list of matching products (Black Pen, Red Pen, Blue Pen).
- The "restock" option also allows a partial product name to be entered. All matching products will be restocked.
- The "restock" option, if given a product name that doesn't exist, will automatically create and add a new product with that name.

Sample I/O:

```
Choice (s/r/v/c/p/x): v
Whiteboard Marker - 85 at $1.50
Whiteboard Eraser - 45 at $5.00
Black Pen - 100 at $1.50
Red Pen - 100 at $1.50
Blue Pen - 100 at $1.50
Choice (s/r/v/c/p/x): s
Name: Green Pen
No such product
Choice (s/r/v/c/p/x): s
Name: black PEN
Selling Black Pen
Number: 1
Choice (s/r/v/c/p/x): s
Name: pen
Multiple products match:
Black Pen - 98 at $1.50
Red Pen - 100 at $1.50
Blue Pen - 100 at $1.50
Choice (s/r/v/c/p/x): s
Name: black
Selling Black Pen
Number: 1
Choice (s/r/v/c/p/x): v
Whiteboard Marker - 85 at $1.50
Whiteboard Eraser - 45 at $5.00
Black Pen - 98 at $1.50
Red Pen - 100 at $1.50
Blue Pen - 100 at $1.50
Choice (s/r/v/c/p/x): r
Name: whiteboard
Restocking Whiteboard Marker
Number: 3
Restocking Whiteboard Eraser
Number: 2
Choice (s/r/v/c/p/x): r
Name: Green Pen
Adding new product
Number: 30
Price: $2.30
Choice (s/r/v/c/p/x): v
```

Whiteboard Marker - 88 at \$1.50
Whiteboard Eraser - 47 at \$5.00
Black Pen - 98 at \$1.50
Red Pen - 100 at \$1.50
Blue Pen - 100 at \$1.50
Green Pen - 30 at \$2.30
Choice (s/r/v/c/p/x): x