

The final project has been completed using various topics learned in class, like classes, functions, etc. Data structures used: classes, doubly linked list, arrays.

Stated below are the different classes used, as well as the functions they contain and the use of the functions.

CLASS: ACCOUNT

Functions:

getBalance - this function is used to get the current balance of the account

setBalance - this function is used to set the balance of the account

printHistory - this function will print the entire transaction history for the account

CLASS: BANK ACCOUNT

Functions:

printDetails - this function will print all the details corresponding to the bank account

printHistory - this is the function that will print the entire transaction history for the bank account

addHistory - this function will be used to add transaction history to the file for the bank account

depositMoney - function to deposit money into the bank account

withdrawMoney - function to withdraw money from the bank account

CLASS: DOUBLY LINKED LIST

Functions:

getHead - returns a pointer to the empty head of the linked list

getTail - returns a pointer to the empty tail of the linked list

getSize - returns the size of the linked list in terms of the number of nodes in it (excluding the head and tail nodes)

insertNode - insert a node before the tail

deleteNode - delete a node given a certain name

findNode - find a node with a certain name

findNodeByPosition - this function will find a node given the position of the node

swapNode - swaps the nodes at position 1 and 2

printList - prints the entire linked list

CLASS: HELPER FUNCTION

Functions:

convertToString - Convert a double to string, with two decimal points

convertTimetoString - Converts a long to string directly

getDate - returns date in mm/dd/yyyy format

getTime - returns time in hh:mm:ss format

checkFile - checks whether file exists or not

clearFile - clears the entire file
searchFile - Search the file to find the line that has the certain string
getLineNum - returns the number of lines in the file
printAllLines - prints all the content of the file
addToLastLine - add a string to the last of the file
getLastLine - prints the last line of the file

CLASS: NODE

Functions:

set_num_stock - this function helps to set the number of stocks
get_num_stock - this function will return the number of stocks
get_name_stock - returns the name of the stock
getPrice - returns the price of the stock

CLASS: SORT STRATEGY

Contains two derived classes: SelectionSort and BubbleSort to determine which type of sorting technique to use. These classes contain the functions

Functions:

sortDoublyLinkedList - to sort the linked list

CLASS: STOCK ACCOUNT

Functions:

get_portfolio_from_file - get portfolio value from file
set_portfolio - set portfolio value and store it to file
get_portfolio - get portfolio value
printDetails - prints all the properties and details of the stock account
printHistory - prints all the transactions of the stock account
getAllStock - get all stock from file and store it to doubly linked list
findPriceByName - find the price of a stock randomly from files by using its name
showStockDetails - show the detail of a stock
sellShares - function used to sell stocks
buyShares - function used to buy stocks
updateStockFile - this function writes the new stock information to file
updatePortfolio - this function writes the new portfolio value along with the time to file
addHistory - add history transactions to file

The program displays the menu and based on the user's input, performs various different actions (like buying a share, selling a share, etc.). The out put obtained from this project is shown below:

Welcome to the Account Management System.

Please select an account to access:

1. Stock Portfolio Account
2. Bank Account
3. Settings (Design Pattern: Strategy)
4. Exit

Option: 1

Stock Portfolio Account

Please select an option :

1. Display the price for a stock symbol
2. Display the current portfolio
3. Buy shares
4. Sell shares
5. View a graph for the portfolio value
6. View transaction history
7. Return to previous menu

Option: 1

Please enter the stock symbol:

GOOG

| Company Symbol | Price per share |
|----------------|-----------------|
| GOOG | \$569.96 |

Stock Portfolio Account

Please select an option :

1. Display the price for a stock symbol
2. Display the current portfolio
3. Buy shares
4. Sell shares
5. View a graph for the portfolio value
6. View transaction history
7. Return to previous menu

Option: 2

Using bubble sort.

Cash balance = \$10000

| CompanySymbol | Number | PricePerShare | TotalValue |
|---------------|--------|---------------|------------|
|---------------|--------|---------------|------------|

You do not have any stock yet.

Total portfolio value: \$10000

Stock Portfolio Account

Please select an option :

1. Display the price for a stock symbol
2. Display the current portfolio
3. Buy shares
4. Sell shares
5. View a graph for the portfolio value
6. View transaction history
7. Return to previous menu

Option: 3

Please enter the stock symbol you wish to purchase:

G00G

Please enter the number of shares:

5

Please enter the maximum amount you are willing to pay per share:

\$575

You have purchased 5 shares of G00G at \$569.96 for a total of \$2849.82.

Stock Portfolio Account

Please select an option :

1. Display the price for a stock symbol
2. Display the current portfolio
3. Buy shares
4. Sell shares
5. View a graph for the portfolio value
6. View transaction history
7. Return to previous menu

Option: 3

Please enter the stock symbol you wish to purchase:

AAPL

Please enter the number of shares:

5

Please enter the maximum amount you are willing to pay per share:

\$100

Transaction failed: Your price is too low.

Stock Portfolio Account

Please select an option :

1. Display the price for a stock symbol
2. Display the current portfolio
3. Buy shares
4. Sell shares
5. View a graph for the portfolio value
6. View transaction history
7. Return to previous menu

Option: 3

Please enter the stock symbol you wish to purchase:

AAPL

Please enter the number of shares:

5

Please enter the maximum amount you are willing to pay per share:

\$500

You have purchased 5 shares of AAPL at \$199.92 for a total of \$999.60.

Stock Portfolio Account

Please select an option :

1. Display the price for a stock symbol
2. Display the current portfolio
3. Buy shares
4. Sell shares
5. View a graph for the portfolio value
6. View transaction history
7. Return to previous menu

Option: 4

Please enter the stock symbol you wish to sell:

G00G

Please enter the number of shares:

2

Please enter the minimum amount you are willing to sell per share:

\$570

Transaction failed: Price per stock is lower than what you want to sell for

Stock Portfolio Account

Please select an option :

1. Display the price for a stock symbol
2. Display the current portfolio
3. Buy shares
4. Sell shares
5. View a graph for the portfolio value
6. View transaction history
7. Return to previous menu

Option: 4

Please enter the stock symbol you wish to sell:

G00G

Please enter the number of shares:

2

Please enter the minimum amount you are willing to sell per share:

\$560

You have sold 2 shares of G00G at \$568.96 for a total of \$1137.93.

Stock Portfolio Account

Please select an option :

1. Display the price for a stock symbol
2. Display the current portfolio
3. Buy shares
4. Sell shares
5. View a graph for the portfolio value
6. View transaction history
7. Return to previous menu

Option: 2

Using bubble sort.

Cash balance = \$7288.51

| CompanySymbol | Number | PricePerShare | TotalValue |
|---------------|--------|---------------|------------|
| GOOG | 3 | \$569.96 | \$1709.89 |
| AAPL | 5 | \$199.92 | \$999.60 |

Total portfolio value: \$9998.00

Stock Portfolio Account

Please select an option :

1. Display the price for a stock symbol
2. Display the current portfolio
3. Buy shares
4. Sell shares
5. View a graph for the portfolio value
6. View transaction history
7. Return to previous menu

Option: 6

| Event | CompSymbol | Number | PricePerShare | TotalValue | Time |
|-------|------------|--------|---------------|------------|----------|
| Buy | GOOG | 5 | \$569.96 | \$2849.82 | 22:45:0 |
| Buy | AAPL | 5 | \$199.92 | \$999.60 | 22:45:40 |
| Sell | GOOG | 2 | \$568.96 | \$1137.93 | 22:46:58 |

Stock Portfolio Account

Please select an option :

1. Display the price for a stock symbol
2. Display the current portfolio
3. Buy shares
4. Sell shares
5. View a graph for the portfolio value
6. View transaction history
7. Return to previous menu

Option: 7

Welcome to the Account Management System.

Please select an account to access:

1. Stock Portfolio Account
2. Bank Account
3. Settings (Design Pattern: Strategy)
4. Exit

Option: 2

Stock Portfolio Account

Please select an option :

1. View account balance
2. Deposit money
3. Withdraw money
4. Print out history
5. Return to previous menu

Option: 1

You have \$7288.51 in your bank account.

Stock Portfolio Account

Please select an option :

1. View account balance
2. Deposit money
3. Withdraw money
4. Print out history
5. Return to previous menu

Option: 2

Please enter the amount you wish to deposit:

\$3000

You have successfully deposit \$3000.00.

You have \$10288.51 in your bank account.

Stock Portfolio Account

Please select an option :

1. View account balance
2. Deposit money
3. Withdraw money
4. Print out history
5. Return to previous menu

Option: 4

| Event | Amount | Date | Balance |
|---------|-----------|------------|------------|
| BuyStk | \$2849.82 | 12/23/2022 | \$7150.18 |
| BuyStk | \$999.60 | 12/23/2022 | \$6150.58 |
| SellStk | \$1137.93 | 12/23/2022 | \$7288.51 |
| Deposit | \$3000.00 | 12/23/2022 | \$10288.51 |

Stock Portfolio Account

Please select an option :

1. View account balance
2. Deposit money
3. Withdraw money
4. Print out history
5. Return to previous menu

Option: 5

