

HONG KONG INSTITUTE OF VOCATIONAL EDUCATION (TSING YI)
DEPARTMENT OF INFORMATION TECHNOLOGY

HIGHER DIPLOMA IN SOFTWARE ENGINEERING (IT114105)
HIGHER DIPLOMA IN COMPUTER SYSTEMS ADMINISTRATION (IT124106)

Module Name: Contemporary Topics in CSA/
Contemporary Topics in Software Engineering

Module Code: ITP4605/ITP4507

Assignment Number: One

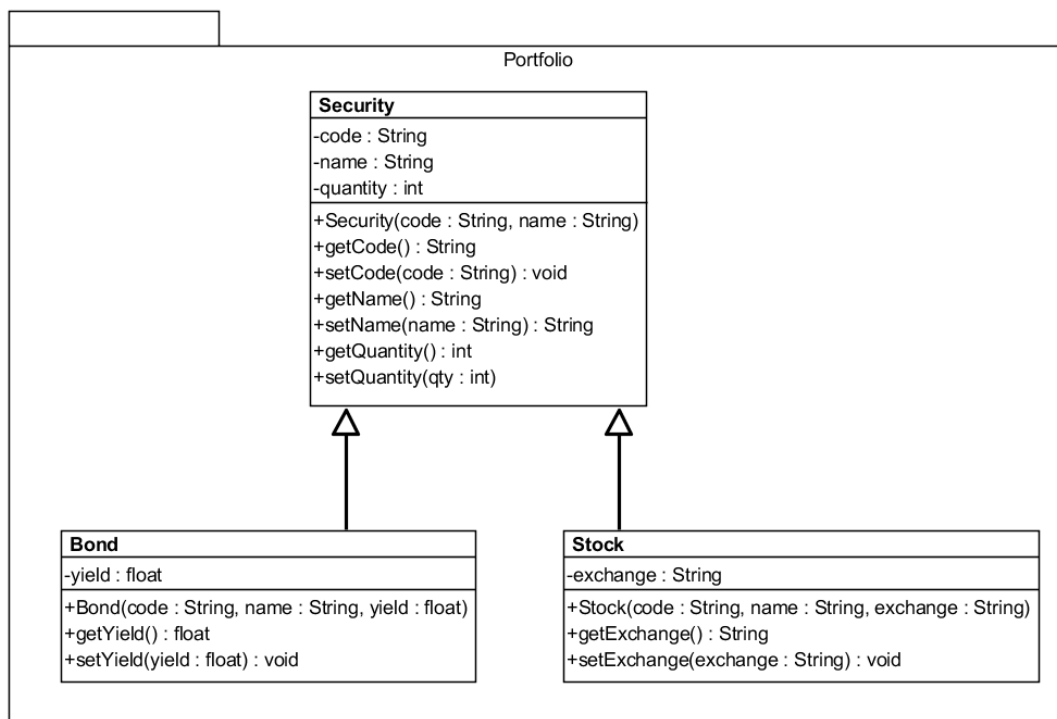
Hand-in: **14 November, 2016**
(On or before 4:30 PM
to Collection Boxes outside Room C440 and Moodle)

Weighting of This Assignment: 50% of the End of Module Assessment

This assignment must be done by individual only. Plagiarism will be treated seriously. Any assignments that are found involved wholly or partly in plagiarism (no matter the assignments are from the original authors or from the plagiarists) will score Zero mark. **Late submission will NOT be accepted.**

Task Specification

ExcelFund Corporation is an asset management company in Hong Kong. It is engaged primarily in the business of investing in and managing a portfolio of securities. The company plans to develop an advanced portfolio management system (APMS) for maintaining security records. The following is the simplified class diagram of existing data maintained by the company.



As a system analyst of the Company, you are required to design and develop APMS. You are reminded that the design of the existing classes: Security, Bond and Stock must be kept unchanged.

The new system module should provide the following functions:

1. Create a security record with zero quantity (Bond or Stock or any new kind of security in the coming future).
2. Show security details (such as code, name, quantity, yield/exchange) by a given code (input code=## to show all records)
3. deposit/withdraw to/from a security record
4. Undo last command
5. Redo the last undone command
6. Show undo/redo list

Your system design should conform to the Open Closed Principle so that your design should easily support new functions (e.g. **change of name of security**) and securities, for example, creation of BankNote record which is a subclass of Security.

You **MUST** apply the following design patterns for your new system

- **Command pattern** to provide the “create”, “display”, “deposit”, “withdraw”, “undo”, “redo” and “show undo/redo list” functions
- **Factory pattern or Abstract Factory Pattern** to create different Command objects and Security objects (e.g. **Bond object, Stock object, etc.**)
- **Memento pattern** to provide “Undo” and “Redo” functions

Assignment Report

In addition to the system development, you are required to write up a **Short Report** covers the following sections:

1. **Assumptions regarding the problem context**
2. **Application design with class diagram**
3. **Discussion and explanation on each of the design patterns applied to the application**
4. **User Guide**
5. **Test Plan and Test Cases**
6. **Well documented Source Code**

Mark Allocation

Your assignment work will be marked according to the following criteria.

Work	Mark Allocated
System Coding and Implementation	
a) Implementation of the system and coding style (Hard-coded output will result in zero mark.)	30%
b) Demonstration * (Hard-coded output will result in zero mark.)	15%
c) User Guide	5%
d) Test Plan and Test Cases (Will be used in testing your own application.)	5%
System Analysis and Design, and Discussion	
e) Design of your system and correct use of design patterns	20%
f) Application design with class diagram	10%
g) Discussion and explanation on each of the design patterns applied to the application	15%
Total	100%

Note: * Please note that you will be asked to recompile all you Java classes during demonstration, and to answer questions regarding your implementation.

Submission of Assignment Work

1. The front page of your submission should include the **programme** title, module title, student identity number(s), student name(s), and group number.
2. Submit a hard copy of all your following work to **Collection Boxes outside Room C440** and submit a zip file of all your work to the module's Moodle website (<https://moodle1617.vtc.edu.hk/course/view.php?id=3077>):
 - Well documented Source Code of your program. Store the Source Code files in Folder "source code\" of your zip file. Store compiled class files and the "run.bat" file for executing the program in Folder "bin\" of your zip file.
 - Report for analysis, design, discussion, user guide, test plan and test cases of your following work. Store the report in Folder "report\" of your zip file.
 - A. The assumption made during analysis and design of the application
 - B. System design on your application with class diagram
 - C. Discussion on the design patterns that applied on your **program**
 - D. User Guide and Test Plan with Test Cases (describe how your program works and develop different test cases for testing each functionality of your program – please include all the required screen dumps).
3. Submit according to the guideline on the top part of cover page. **Late submission will NOT be accepted.**

Extra Reference

This sample run is served for reference only. You are free to design your own user interface.

Sample Run of assignment

You may follow the design of user interface shown in this sample run in DOS command prompt.

User's inputs are in bold face.

1. Create Security Record (n)

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

n

Enter security type (bo=bond/st=stock):

bo

Enter code, name and yield:

TB2020, TBond 2020, 5.5

New security record created.

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

n

Enter security type (bo=bond/st=stock):

st

Enter code, name and stock exchange:

GECH, Green Energy China, HKX

New security record created.

2. Show one security record (s)

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

s

Enter code (## to show all):

TB2020

Security information

Code: TB2020

Name: TBond 2020

Quantity: 0

Yield: 5.5

Show all records

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

s

Enter id (## to show all):

##

Security information

Code	Name	Quantity	Other Info
TB2020	TBond 2020	0	Yield:5.5
GECH	Green Energy China	0	Exchange:HKX

3. Deposit security (d)

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

d

Enter code:

TB2020

Quantity to deposit:

100

Deposited 100 to TB2020. Current quantity is 100.

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

d

Enter code:

GECH

Quantity to deposit:

200

Deposited 200 to GECH. Current quantity is 200.

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

s

Enter code (## to show all):

##

Security information

Code	Name	Quantity	Other Info
TB2020	TBond 2020	100	Yield:5.5

4. Withdraw Security (w)

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

w

Enter code:

TB2020

Quantity to withdraw:

50

Withdrew 50 from TB2020. Current quantity is 50.

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

w

Enter code:

GECH

Quantity to withdraw:

100

Withdrew 100 from GECH. Current quantity is 100.

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

s

Enter code (## to show all):

##

Security information

Code	Name	Quantity	Other Info
TB2020	TBond 2020	50	Yield:5.5
GECH	Green Energy China	100	Exchange:HKX

Withdrawing an invalid quantity (current quantity < withdrawal quantity) from security will display a warning message. Note that this invalid operation should not be shown in Undo List afterward.

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

w

Enter code:

GECH

Quantity to withdraw:

200

Invalid quantity (current quantity < withdrawal quantity).

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

5. Display the Undo/Redo List (l)

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

l

Undo List:

Create TB2020

Create GECH

Deposit 100 TB2020

Deposit 200 GECH

Withdraw 50 TB2020

Withdraw 100 GECH

Redo List:

Empty

6. Undo Last Command in the Undo List (u)

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

u

undo completed.

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

l

Undo List:

Create TB2020

Create GECH

Deposit 100 TB2020

Deposit 200 GECH

Withdraw 50 TB2020

Redo List:
Withdraw 100 GECH

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

u

undo completed.

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

l

Undo List:

Create TB2020

Create GECH

Deposit 100 TB2020

Deposit 200 GECH

Redo List:

Withdraw 100 GECH

Withdraw 50 TB2020

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

s

Enter code (## to show all):

##

Security information

Code	Name	Quantity	Other Info
TB2020	TBond 2020	100	Yield:5.5
GECH	Green Energy China	200	Exchange:HKX

7. Redo the last undo command (r)

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

l

Undo List:

Create TB2020

Create GECH

Deposit 100 TB2020

Deposit 200 GECH

Redo List:

Withdraw 100 GECH

Withdraw 50 TB2020

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

r

redo completed.

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

s

Enter code (## to show all):

##

Security information

Code	Name	Quantity	Other Info
TB2020	TBond 2020	50	Yield:5.5
GECH	Green Energy China	200	Exchange:HKX

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

l

Undo List:

Create TB2020

Create GECH

Deposit 100 TB2020

Deposit 200 GECH

Withdraw 50 TB2020

Redo List:
Withdraw 100 GECH

8. Exit the System (X)

Advanced Security Management System

Please enter command: [n | s | d | w | c | u | r | l | q]

n = create security, s = show security, d = deposit security, w = withdraw security,
u = undo, r = redo, l = list undo/redo, q = exit system

q

Leaving System...

End of Sample Run

***** END *****