20.6 Program 3a: Stock Information

Objectives

* Polymorphism with Overloading
* Inheritance by extending classes
* Code in an IDE and upload to grading program
* Use documentation and code structure according to class guidelines

Program Description

In this assignment, you will create two classes that will implement a "has-a" relationship. The base class will be **Stock** which would have objects of **Financials** class.

Task 1

Create a class **Financials** that will have the following private variables:

* double PE, which be the price to earnings ratio
* double EPS, which will be the earnings per share
* boolean hasDiv, which will indicate whether a company has dividends or not

The following constructors will be implemented in this class:

* Financials()
  + set PE and EPS to 0.0
  + set hasDiv to false
* Financials(double PE, double EPS, boolean hasDiv)
  + set all variables as per the parameters passed
  + Hint: Refer to ZB 7.9 to use **this** keyword

The following methods will be implemented in this class:

* getPE()
* setPE()
* getEPS()
* setEPS()
* hasDividends(), returns the value for the hasDiv class variable
* override toString(), which should returns a String in the following format

Price/Earnings: "PE"; Earnings/Share: "EPS"; Dividends: "hasDiv"

Task 2

Create a new class **Stock** that will have the following private variables:

* String ticker, which will represent the ticker or the symbol of the stock
* String name, which will be the name of listed public company
* int numShares, which will be the total quantity of the shares owned
* double currValue, which will be the current value of the stock
* double totValue, which will be the total value of the stocks owned (totValue = currValue \* numShares)
* Financials quarFinancials, which will contain the financials for the last quarter
* Financials annFinancials, which will contain the financials for the last annual year

The following constructor will be implemented in this class:

* Stock(String ticker, String name,int numShares, double currValue)
  + also, calculate the totValue inside the constructor (totValue = numShares \* currValue)

The following methods will be implemented in this class:

* getStockInfo() which would return a String containin the stock information as formatted below, where you replace the capitalized variable names with the values stored in the class:

NAME (TICKER); Total Shares Owned: NUMSHARES; Total Value: TOTVALUE

* buyShares(int shares)
  + add the number of shares bought by the user to the total shares
  + recalculate totValue
* sellShares(int shares)
  + subtract the number of shares sold by the users.
  + recalculate totValue
  + note that the number of shares that a user can sell cannot be more than the numShares owned
* setFinancials(Financials financial, String option)
  + If option equals "quarter", set quarFinancials to the Financials object passed as the parameter
  + If option equals "annual", set annFinancials to the Financials object passed as the parameter
  + Display "Error: Wrong Option" if none of the above
* getFinancials(String option)
  + depending on the option {"quarter" or "annual"}, return out the financials of the company using the toString() method of the Financials class
* getInfo(), which returns a String containing

Program 3a, Name

Turning In Procedure

* You are required to submit the all the .java files in Zybooks which will be autograded.
* The automatic grading program is very specific. If you feel you have the correct solution but are not receiving full credit, please
  + Carefully review the output -- you might need to scroll all the way to the right to find what is wrong with a particular output.
  + Verify you have the correct names for the program itself and all methods.
  + Check your calculations by hand: was there a logic error?
  + Review the requirements: did you miss a step? misinterpret a requirement?
  + If all these check out, contact the T.A. for assistance.