```
/*Project 1 - Harley Phung
 Task 4 Project 1: Create a Customer class that stored customer's information
including their stock, balance, and dates.
 Calculate the cash account balance after each transaction.
 */

public class Customer {
//A field that stored the customer's first name
  private String firstName = " ";
  // A field that stored the customer's last name
  private String lastName = " ";
  //A field that stored the customer's address
  private String address = " ";
  //A field that stored the customer's stock account (return instance from Stock
class)
  private Stock stockAccount = new Stock(" ", " ", 0.0);
  //A field that stored the customer's cash account (return instance from Cash
class)
  private Cash cashAccount = new Cash(0.0, 0.0, 0.0, 0.0);
  //A field that stored customer's commission
  private double commission = 0;
  //A field that stored customer account's date (return instance from Date class)
  private Date date = new Date(1, 1, 1);
  //A field that stored cash balance plus Stock number of shares times stock
current price
  private double currentValue = 0;
  //A field that stored an amount to add to Cash balance
  private double amount = 0;
  //A field that stored total Yearly Interest
  private double totalYearlyInterestEarned = 0;
  //A field that stored totalYearlyCapitalGains
  private double totalYearlyCapitalGainsEarned = 0;
  //A filed that sotred the last Capital Gains (use when calculate yearly capital
gains earned)
  private double lastCapitalGainsEarned = 0;


  //Constructor contain first name, last name, address, commission, stock account,
cash account, date
  public Customer(String firstName, String lastName, String address, double
commission, Stock stockAccount, Cash cashAccount, Date date) {
    this.firstName = firstName;
    this.lastName = lastName;
    this.address = address;
    this.commission = commission;
    this.stockAccount = stockAccount;
    this.cashAccount = cashAccount;
    this.date = date;
  }

//A method that returns the first name of the account
  public String getFirstName() {
    return this.firstName;
  }

  //A method that changes the first name of the account
  public void setFirstName(String firstName) {
    this.firstName = firstName;
  }
```

```
//A method that returns the last name of the account
public String getLastName() {
  return this.lastName;
}

//A method that changes the last name of the account
public void setLastName(String lastName) {
  this.lastName = lastName;
}

//A method that returns address of the account
public String getAddress() {
  return this.address;
}

//A method that changes address of the account
public void setAddress(String address) {
  this.address = address;
}

//A method that returns Stock instance associate with the account
public Stock getStockAccount() {
  return this.stockAccount;
}

//A method that changes Stock instance associate with the account
public void setStockAccount(Stock stockAccount) {
  this.stockAccount = stockAccount;
}

//A method that returns cash instance
public Cash getCashAccount() {
  return this.cashAccount;
}

//A method that changes the cash account instance
public void setCashAccount(Cash cashAccount) {
  this.cashAccount = cashAccount;
}

//A method that return Commission for the account
public double getCommissionAmount() {
  return this.commission;
}

//A method that changes the commission amount
public void setCommissionAmount(double commission) {
  this.commission = commission;
}

//Return date instance
public Date getDate() {
  return this.date;
}

//Returns the Cash Balance plus the Stock number of shares * Stock current price
public double currentValue() {
  this.currentValue = this.cashAccount.getBalance() +
```

```
this.stockAccount.getNumberShares() * this.stockAccount.getCurrentPrice();
    return this.currentValue;
  }

  //add amount to the Cash balance
  public void deposit(double amount) {
    this.cashAccount.deposit(amount);
  }

  //if amount is less than or equal to the Cash balance, reduces the Cash balance
by amount and returns true or return false and no change to Cash balance
  public boolean withdraw(double amount) {
    if (amount <= this.cashAccount.getBalance()) {
      this.cashAccount.withdraw(amount);
      return true;
    }
    else {
      return false;
    }
  }

  //calls the Stock sell method with the customer commission value and adds the
amount returned to the Cash balance when sell number of Stock shares
  public void sellShares(int numShares) {
    this.cashAccount.deposit(this.stockAccount.sell(numShares,this.commission));
  }

  //Check if the account balance be able to buy more number of stock shares.If
Stock's buy method with Customer's numShare + Customer's commission
  //equals to negative Customer's current Value, return false. Else, return Cash
balance - total numshares * current price (Stock's cost basis)
  public boolean buyShares(int numShares) {
    if (this.currentValue() - this.getCommissionAmount() < 0) {
      /*If this.cashAccount.getBalance() = B, owned numShares = S, bought numShares
= S', this.stockAccount.getCurrentPrice() = P, this.commission = C
       * B - (S' * P + C) + (S+S')*P = B - S * P - C = this.currentValue() - C
       */
      return false;
    }

    else {
      this.cashAccount.transfer(this.stockAccount.buy(numShares, this.commission));
      return true;
    }
  }

  //A method that calculate if the account should have overdraft penalty over month
or capital gains over year

  public void incrementDate() {
    int lastMonth = this.date.getMonth();
    int lastYear = this.date.getYear();

    this.date.incrementDay();
    this.cashAccount.processDay();
    if (lastMonth != this.date.getMonth()) {
      this.cashAccount.processMonth();
    }
    if (lastYear != this.date.getYear()) {
```

```
      if(this.cashAccount.getBalance() > 0) {
        this.totalYearlyInterestEarned = this.cashAccount.getBalance() *
this.cashAccount.getSavingsRate();
      }
      else {
        this.totalYearlyInterestEarned = this.cashAccount.getBalance() *
this.cashAccount.getLoanRate();
      }

      this.totalYearlyCapitalGainsEarned = this.stockAccount.getCapitalGains() -
this.lastCapitalGainsEarned;
      this.lastCapitalGainsEarned = this.stockAccount.getCapitalGains();

    }
  }

  //A method that returns the total interest of the last year
  public double yearlyInterestEarned() {
    return this.totalYearlyInterestEarned;
  }

  //A method that return the the total capital gains of the last year
  public double yearlyCapitalGainsEarned() {
    return this.totalYearlyCapitalGainsEarned;
  }
}
```