Class Demonstration of Bank Java Project (CS591 Java OOD)

- **Class AccountType**
  - **Attribute**
    - ***Checking*****:** enum type, it means the account is checking account
    - ***Saving*****:** enum type, it means the account is saving account
    - ***Security*****:** enum type, it means the account is security account

- **Class TransactionType**
  - **Attribute**
    - ***SEND*** : enum type, it means the transaction is to send money
    - ***Receive*** : enum type, it means the transaction is to receive money
    - ***SELL*** : enum type, it means the transaction is to sell bonds or stocks
    - ***BUY*** : enum type, it means the transaction is to buy bonds or stocks
    - ***WITHDRAW*** : enum type, it means the transaction is to withdraw money from account
    - ***LOAN*** : enum type, it means the transaction is to loan money from the bank
    - ***SAVE*** : enum type, it means the transaction is to save money in the bank

- **Class Transaction**
  - **Attribute**
    - TransactionType ***type*** : indicate the type of the transaction
    - String ***sender*** : uid of the account which saves, sends, loans, withdraws money or buy or sell investment
    - String ***receiver*** : uid of the account which receives money
    - String ***money*** : amount of money involved in the transaction
    - String ***investmentId*** : sid of investment
    - double ***amount*** : amount of investment
    - String ***date*** : the time of the transaction

- **Class Investment**
  - **Attribute**
    - private String ***id*** : unique for each investment product
  - **Method**

        - String ***getId***() : get id of the investment

- **Class Stock(extends from Investment)**
    - **Attribute**
        - double ***price*** : current price for stock per share
        - String ***name*** : name of the stock
    - **Method**
        - void ***change***( ) : change the price of the stock as the program runs

- **Class Bond(extends from Investment)**
    - **Attribute**
        - double ***weeklyInterestRate*** : weekly interest rate of bond
        - double ***monthlyInterestRate*** : monthly interest rate of bond
        - double ***yearlyInterestRate*** : yearly interest rate of bond
- **Class Property**
    - **Attribute**
        - Investment ***investment*** : which stock / bond
        - double ***amount*** : stock : number of share, bond : money
        - double ***interest*** : bond interest rate
    - **Method**
        - boolean ***add***(double am) : only can be triggered if the property is stock, add am share

        - double ***sell***( ) : sell all bonds and return profits

        - double ***sell***(double am, double price) : sell ***am*** share stock at ***price***, and return profits

- **Class Account**
    - **Attribute**
        - double ***Aid*** : unique for each account
        - Arraylist<Transaction> ***transactions*** : record all transactions in the account
        - double ***money*** : balance in the accoutn
        - double ***interestRate*** : interest rate of the account
        - AccountType ***type*** : type of account

    - **Method**
        - boolean ***withdraw***(double m) : withdraw ***m*** money from the account, if the balance of the account is less than money **m**, return false otherwise true and write corresponding transaction record

        - boolean ***save***(double m) : save ***m*** money in the account, if m is less than 0, return false, otherwise return true

        - boolean ***loan***(double m) : loan ***m*** money from the account and and write corresponding transaction record

        - boolean ***send***(double m, String receiver) : send money ***m*** to account ***receiver***, iif the balance of the account is less than money **m**, return false otherwise true and write corresponding transaction record

        - boolean ***receive***(double m, String sender) : receiver money ***m*** from account ***sender*** and write corresponding transaction record

- **Class CheckingAccount (extends from Class Account)**

- **Class SavingAccount (extends from Class Account)**

- **Class SecurityAccount (extends from Class Account)**
    - **Attribute**
        - HashMap<String, Property> ***property*** : <key : unique id of investment, value : Property>, record all investments owned by the account

    - **Method**
        - boolean ***buyBond***(double Money, Investment i, Property.InterestRate irate, double interest) : use ***Money*** money buy ***i*** bond at ***interest*** interest rate, ***irate*** indicates whether it is weekly, monthly or yearly

        - boolean ***buyStock***(Investment i, int amount, double price) : buy ***amount*** number of ***i*** stock at ***price***

        - boolean ***sellBond***(String sid) : sell unique id of bonds, which equals to sid, if the account does not have, return false otherwise true

        - boolean ***sellStock***(String sid, double amount, double price) : sell ***amount*** number of stock whose id is ***sid*** at ***price***

- **Class User**
    - **Attribute**
        - String ***Uid*** : unique id for a User
        - String ***password*** : password to the account
        - String ***name*** : owner name
        - HashMap<String, Account> ***accounts*** : <key : Aid of the account, value : account >accounts own by the user
        - static int ***count*** : used to generate Aid of the account, Aid = Uid + “-” + count
    - **Method**
        - ArrayList<String> ***getAccountId***() : get a list of ***Aid*** of accounts owned by the user

        - boolean ***loanMoney***(String sender, double m) : Account ***sender*** loans ***m*** money

        - boolean ***saveMoney***(String sender, double m) : Account ***sender*** saves ***m*** money

        - boolean ***sendMoney***(double m, String receiver, String sender) : Account ***sender*** sends ***m*** money to ***receive*** account

        - boolean ***receiveMoney***(double m, String receiver, String sender) : Account ***receiver*** receives ***m*** money from ***sender*** account

- boolean **withdrawMoney**(double m, String sender) : Account ***sender*** withdraws m money from account

- boolean buyStock(Investment i, int amount, double price, String sender) : Account ***sender*** buys ***amount*** stock ***i*** at ***price***

- boolean ***buyBond***(double Money, Investment i, Property.InterestRate irate, double interest, String sender) :Account ***sender*** utilizes ***Money*** and buys bond ***i***, with interest rate ***interest***

- boolean ***sellBond***(String sender, String sid) : Account ***sender*** sell bond whose id equals to ***sid***

- boolean ***sellStock***(String sender, String sid, double amount, double price) : Account ***sender*** sells ***amount*** share of stock whose id equals to ***sid*** at ***price***

- boolean ***closeAccount***(String sender) : close Account ***sender***

- **Class Bank**
  - **Attributte**
    - HashMap<String, User> ***users*** : <key : uid, value : user>, record all information of users

    - HashMap<String, Investment> ***investments*** : <key : sid, value : stock / bond>, record all investment products provided by the bank

    - static int ***userCount*** : used to generate user id

    - static int ***investmentCount*** : used to generate investment id
  - **Method**
    - boolean ***addStock***(double p, String n) : add stock whose name is ***n*** and price is ***p***

    - boolean ***addbond***() : add a new bond

    - String ***createAccounts***(String name, String password) : create an user account whose name is ***name*** and password is ***password*** , return ***Uid*** of the account

    - String ***createCheckingAccount***( ) ***createSavingAccount***( ) ***createSecurityAccount***(String Uid,double money) : create corresponding type of account in the user account, and return ***Aid*** of the account, if the user account does not exist, return ***null***

    - boolean ***logIn***(String Uid, String password) : log in account whose uid is ***Uid*** with ***password***

    - boolean ***close***(String Uid) : close account whose uid is ***Uid***

- boolean ***withdrawMoney***(String Aid, double money) : Withdraw ***money*** from account ***Aid***

- boolean ***loanMoney***(String Aid, double money) : Loan ***money*** from account ***Aid***

- boolean ***sendMoney***(double m, String receiver, String sender) : Accout ***sender*** sends ***m*** money to Account ***receiver***

- boolean ***buyBond***(double Money, String sid, Property.InterestRate irate, double interest, String sender) : Account ***sender*** buys bond whose id is ***sid*** and interest rate is ***interest*** with money ***Money***

- boolean ***buyStock***(String sid, int amount, double price, String sender) : Account ***sender*** buys ***amount*** share of stock whose id is ***sid*** at ***price***

- boolean ***sellBond***(String sender, String sid) : Account ***sender*** sells bond whose id is ***sid***

- boolean ***sellStock***(String sender, String sid, double amount, double price) : Account ***sender*** sells stock ***amount*** share of stock whose id is ***sid*** at ***price***

- String ***getInvestmentInfo***() : get all the info of investments provided by the bank