CISC 327 Assignment 2
Breaking Bank

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Design Document

For our architecture we have chosen to go with a Main program, which contains one function, and with 2 classes that handle agent and retail. When our program first runs the main program opens our current accounts file (to be accessed during transactions), and then executes our openBankingSystem function, this function is designed to handle the system login, which type of day to run, and restarting the system after logout. However the function itself does not take the logout command as input, rather receives a logout signal from either a retail or agent day, and then proceeds to restart the system at the pre-login stage.

Our Agent and Retail classes are quite similar in construction and how they operate. The openBankingSystem function instantiates one of these classes and then runs either the runAgentDay or runRetailDay method within the class based on which type was instantiated. These methods are meant to be running to receive any sort of transaction that might occur during a banking day. This is also where the logout command will be received and then returns a logout signal back to openBankingSystem for it to reboot the system.

This is architecture is modeled after the 0 to 3 stage architecture (See Figure 1) modeled during class. We decided to implement a similar design because it would make the simplest solution. The 0 and 1 phase of the design are handled by the openBankingSystem function in our main program. Our Retail and Agent classes represent the 2 and 3 phases respectively. The logout functionality is handled in a similar way with either stage 2 or 3 receiving the logout command and starting over in stage 0.

Figure 2 is a simple UML diagram of the programs structure. We've taken some liberties in UML standards to illustrate the structure. Main program isn't actually a class, because of the way python operates. We have chosen to represent it this way to show that openBankingSystem is apart of the main program. Agent and Retail are classes as shown with all the methods they have. The arrows pointing from these classes to main program are not hierarchy but rather symbolize the relationship between main, agent and retail. Since openBankingSystem instantiates one of these classes, we felt it appropriate to represent it in this way.

Figure 1

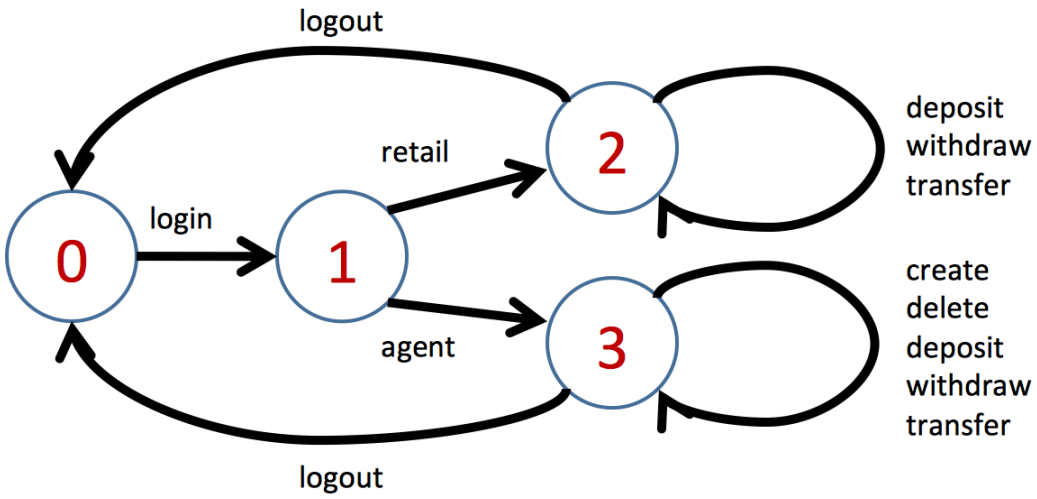
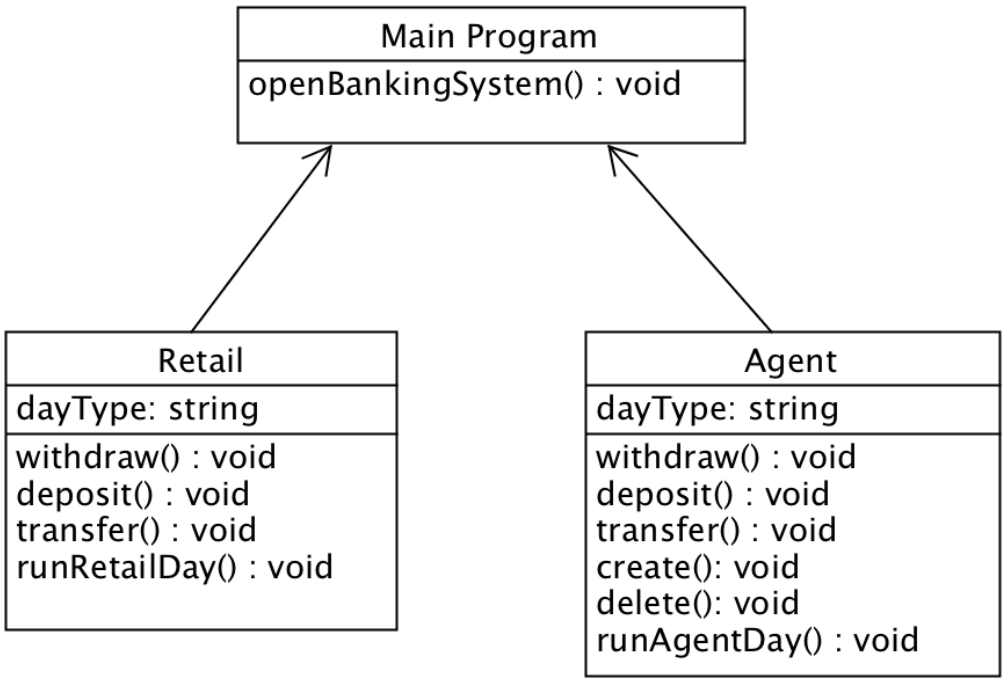

logout
retail
2
deposit
withdraw
transfer
login
0
1
create
delete
deposit
withdraw
transfer
agent
3
logout

Figure 2


Main Program
openBankingSystem() : void
Retail
dayType: string
withdraw() : void
deposit() : void
transfer() : void
runRetailDay() : void
Agent
dayType: string
withdraw() : void
deposit() : void
transfer() : void
create(): void
delete(): void
runAgentDay() : void

Class	Method	Function
Main Program	openBankingSystem	Handles login, agent/retail instances (Stage 0 and 1, from Figure 1)
Retail	withdraw	Accepts input for a withdraw transaction during Retail, tests for valid input, performs transaction, returns transaction string for summary file.
Retail	deposit	Accepts input for a deposit transaction during Retail, tests for valid input, performs transaction, returns transaction string for summary file.
Retail	transfer	Accepts input for a transfer transaction during Retail, tests for valid input, performs transaction, returns transaction string for summary file.
Retail	runRetailDay	Handles any and all transactions received during a retail day. Tests input and starts the transaction's method to perform the transaction. Logout is received here and sends logout signal to openBankingSystem. Our transactions summary file is created and written during this function.
Agent	withdraw	Accepts input for a withdraw transaction during Agent, tests for valid input, performs transaction, returns transaction string for summary file.
Agent	deposit	Accepts input for a deposit transaction during Agent, tests for valid input, performs transaction, returns transaction string for summary file.
Agent	transfer	Accepts input for a transfer transaction during Agent, tests for valid input, performs transaction, returns transaction string for summary file.
Agent	create	Accepts input to create account during agent day. Tests that it is able to create the new account. Creates account and returns transaction string for summary file.
Agent	delete	Accepts input to delete account during agent day. Tests that it is able to delete the account. Deletes account and returns transaction string for summary file.

Agent	runAgentDay	Handles any and all transactions received during a agent day. Tests input and starts the transaction's method to perform the transaction. Logout is received here and sends logout signal to openBankingSystem. Our transactions summary file is created and written during this function.

```
"""
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```

```
Assignment #2
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"""
import datetime
import time
import os.path

############################################  RETAIL
################################################
class retail(object):
      def __init__(self, type,dailylimit):
            self.type = type
            self.dailylimit = dailylimit

      def withdraw(self):
            accNumInput = True
            while (accNumInput):
                  accNum = raw_input('Account Number: ')
                  #CHECK TO SEE IF VALID ACCOUNT NUMBER
                  if (1 == 1): #if account num is valid
                        amt = True
                        accNumInput = False
                        while (amt):
                              amount = int(input('Withdrawal Amount:
'))
                              amount = amount*100
                              if (amount > 100000):
                                    print "Please enter a valid
amount."
                              elif (amount < 0):
                                    print "Please enter a valid
amount."
                              elif (self.dailylimit + amount >
100000):
                                    print "This amount exceeds your
daily limit."
                              else:
                                    self.dailylimit += amount
                                    amt = False
                                    #CREATE STRING TO WRITE TO FILE
                                    accNum = str(accNum)
                                    amount = str(amount)
                                    transactionInfo = '02_' + accNum +
'_' + amount #NEEDS PROPER FORMATTING STILL
                  else:
                        print "Please enter a valid account number."
            return transactionInfo

      def deposit(self):
            accNumInput = True
            while (accNumInput):
                  accNum = raw_input('Account Number: ')
                  #CHECK TO SEE IF VALID ACCOUNT NUMBER
                  if (1 == 1): #if account num is valid
```

```
                        amt = True
                        accNumInput = False
                        while (amt):
                              amount = int(input('Deposit Amount: '))
                              amount = amount*100
                              if (amount > 100000):
                                    print "Please enter a valid
amount."
                              elif (amount < 0):
                                    print "Please enter a valid
amount."
                              else:
                                    amt = False
                                    #CREATE STRING TO WRITE TO FILE
                                    accNum = str(accNum)
                                    amount = str(amount)
                                    transactionInfo = '01_' + accNum +
'_' + amount #NEEDS PROPER FORMATTING STILL
                  else:
                        print "Please enter a valid account number."
            return transactionInfo

      def transfer(self):
            accNumInput = True
            accNumInput2 = True
            while(accNumInput):
                  accNumTo = raw_input('To Account Number: ')
                  #CHECK to SEE IF FIRST ACCOUNT NUMBER IS VALID
                  if (1 == 1):
                        while (accNumInput2):
                              accNumFrom = raw_input('From Account
Number: ')
                              #CHECK TO SEE IF SECOND ACCOUNT NUMBER
IS VALID
                              if (1 == 1):
                                    accNumInput = False
                                    accNumInput2 = False
                                    amt = True
                                    while (amt):
                                          amount = int(input('Transfer
Amount: '))
                                          amount = amount*100
                                          if (amount > 100000):
                                                print "Please enter a
valid transfer amount."
                                          elif (amount < 0):
                                                print "Please enter a
valid transfer amount."
                                          else:
                                                amt = False
                                                #create string for
write file
                                                accNumTo =
str(accNumTo)
```

```
                                                accNumFrom =
str(accNumFrom)
                                                amount = str(amount)
                                                transactionInfo =
'03_' + accNumTo + '_' + accNumFrom + '_' + amount
                                    else:
                                          print "Please enter a valid
account number."
                        else:
                              print "Please enter a valid account number."
                  return transactionInfo

            #METHOD WHICH RUNS ANY TRANSACTIONS FOR A RETAIL DAY
            #WILL WRITE ANY TRANSACTIONS TO FILE
            #LOGOUT IS ACCEPTED AT THIS STAGE
            def runRetailDay(self):
                  running = True
                  #CREATES TRANSACTION SUMMARY FILE
                  ts = time.time()
                  st = datetime.datetime.fromtimestamp(ts).strftime('%Y-%m-
%d %H:%M:%S')
                  save_path = './TransactionSummaryFiles/'
                  file = 'Transaction_Summary_File__' + st + '.txt'
                  filename = file.replace(":", "_")
                  completeName = os.path.join(save_path, filename)
                  f = open(completeName,'w')
                  while (running):
                        #STARTS ACCEPTING RETAIL TRANSACTIONS
                        transaction = raw_input('Perform a transaction: ')
                        transaction.lower()
                        #TESTS INPUT FOR WHICH TRANSACTION TYPE TO PERFORM
                        if (transaction == "withdraw"):
                              newTrans = self.withdraw()
                              f.write(newTrans + '\n')
                        elif (transaction == "deposit"):
                              newTrans = self.deposit()
                              f.write(newTrans + '\n')
                        elif (transaction == "transfer"):
                              newTrans = self.transfer()
                              f.write(newTrans + '\n')
                        elif (transaction == "logout"):
                              f.close()
                              running = False
                        else:
                              print "Please enter a valid transaction
type."
                  return False
########################################################################
#####################################

##############################################  AGENT
################################################
class agent(object):
      def __init__(self, type):
            self.type = type
```

```
      def withdraw(self):
            accNumInput = True
            while (accNumInput):
                  accNum = raw_input('Account Number: ')
                  #CHECK TO SEE IF VALID ACCOUNT NUMBER
                  if (1 == 1): #if account num is valid
                        amt = True
                        accNumInput = False
                        while (amt):
                              amount = int(input('Withdrawal Amount:
'))
                              amount = amount*100
                              if (amount > 999999):
                                    print "Please enter a valid
amount."
                              elif (amount < 0):
                                    print "Please enter a valid
amount."
                              else:
                                    amt = False
                                    #CREATE STRING TO WRITE TO FILE
                                    accNum = str(accNum)
                                    amount = str(amount)
                                    transactionInfo = '02_' + accNum +
'_' + amount #NEEDS PROPER FORMATTING STILL
                  else:
                        print "Please enter a valid account number."
            return transactionInfo

      def deposit(self):
            accNumInput = True
            while (accNumInput):
                  accNum = raw_input('Account Number: ')
                  #CHECK TO SEE IF VALID ACCOUNT NUMBER
                  if (1 == 1): #if account num is valid
                        amt = True
                        accNumInput = False
                        while (amt):
                              amount = int(input('Deposit Amount: '))
                              amount = amount*100
                              if (amount > 999999):
                                    print "Please enter a valid
amount."
                              elif (amount < 0):
                                    print "Please enter a valid
amount."
                              else:
                                    amt = False
                                    #CREATE STRING TO WRITE TO FILE
                                    accNum = str(accNum)
                                    amount = str(amount)
                                    transactionInfo = '01_' + accNum +
'_' + amount #NEEDS PROPER FORMATTING STILL
                  else:
```

```
                        print "Please enter a valid account number."
            return transactionInfo

      def transfer(self):
            accNumInput = True
            accNumInput2 = True
            while(accNumInput):
                  accNumTo = raw_input('To Account Number: ')
                  #CHECK to SEE IF FIRST ACCOUNT NUMBER IS VALID
                  if (1 == 1):
                        while (accNumInput2):
                              accNumFrom = raw_input('From Account
Number: ')
                              #CHECK TO SEE IF SECOND ACCOUNT NUMBER
IS VALID
                              if (1 == 1):
                                    accNumInput = False
                                    accNumInput2 = False
                                    amt = True
                                    while (amt):
                                          amount =
int(raw_input('Transfer Amount: '))
                                          amount = amount*100
                                          if (amount > 999999):
                                                print "Please enter a
valid transfer amount."
                                          elif (amount < 0):
                                                print "Please enter a
valid transfer amount."
                                          else:
                                                amt = False
                                                #create string for
write file
                                                accNumTo =
str(accNumTo)
                                                accNumFrom =
str(accNumFrom)
                                                amount = str(amount)
                                                transactionInfo =
'03_' + accNumTo + '_' + accNumFrom + '_' + amount
                              else:
                                    print "Please enter a valid
account number."
                  else:
                        print "Please enter a valid account number."
            return transactionInfo

      def create(self):
            accNumInput = True
            accNameInput = True
            while (accNumInput):
                  accNum = int(input('Enter your desired account
number: '))
                  #Account Number must be 6 digits. Maximum of
999999, so if < 1000000, account number is 6 digits long
```

```
                  #CHECK TO SEE IF INPUT ACCOUNT NUMBER DOES NOT
EXIST
                  if (1 == 1):
                        accNumInput = False
                        while (accNameInput):
                              accName = raw_input('Enter your desired
account name: ')
                              if (len(accName) > 15 | len(accName) ==
0):
                                    print "Please enter a valid
account name."
                              else:
                                    #create account number here
                                    accNameInput = False
                                    #create string for write file
                                    accNum = str(accNum)
                                    accName = str(accName)
                                    transactionInfo = '04_' + accNum +
"_" + accName #proper formatting on end of string is needed
                  else:
                        print "Please enter a valid account number."
            return transactionInfo

      def delete(self):
            accNumInput = True
            accNameInput = True
            while (accNumInput):
                  accNum = int(input('Enter the account number: '))
                  #CHECK TO SEE IF INPUT ACCOUNT NUMBER EXISTS
                  if (1 == 1):
                        accNumInput = False
                        while (accNameInput):
                              accName = raw_input('Enter the account
name: ')
                              #CHECK TO SEE IF INPUT ACCOUNT NAME
MATCHES ACCOUNT NUMBER
                              if (1 == 0):
                                    print "Please enter the proper
account name for this account."
                              else:
                                    #delete account now
                                    accNameInput = False
                                    #create string for write file
                                    accNum = str(accNum)
                                    accName = str(accName)
                                    transactionInfo = '05_' + accNum +
'_' + accName #proper formatting on end of string is needed
                  else:
                        print "Please enter a valid account number."
            return transactionInfo

      #METHOD WHICH RUNS ANY TRANSACTIONS FOR A RETAIL DAY
      #WILL WRITE ANY TRANSACTIONS TO FILE
      #LOGOUT IS ACCEPTED AT THIS STAGE
      def runAgentDay(self):
```

```
            running = True
            #CREATES TRANSACTION SUMMARY FILE
            ts = time.time()
            st = datetime.datetime.fromtimestamp(ts).strftime('%Y-%m-
%d %H:%M:%S')
            save_path = './TransactionSummaryFiles/'
            file = 'Transaction_Summary_File__' + st + '.txt'
            filename = file.replace(":", "_")
            completeName = os.path.join(save_path, filename)
            f = open(completeName,'w')
            while (running):
                  #STARTS ACCEPTING RETAIL TRANSACTIONS
                  transaction = raw_input('Perform a transaction: ')
                  transaction.lower()
                  #TESTS INPUT FOR WHICH TRANSACTION TYPE TO PERFORM
                  if (transaction == "withdraw"):
                        newTrans = self.withdraw()
                        f.write(newTrans + '\n')
                  elif (transaction == "deposit"):
                        newTrans = self.deposit()
                        f.write(newTrans + '\n')
                  elif (transaction == "transfer"):
                        newTrans = self.transfer()
                        f.write(newTrans + '\n')
                  elif (transaction == "create"):
                        newTrans = self.create()
                        f.write(newTrans + '\n')
                  elif (transaction == "delete"):
                        newTrans = self.delete()
                        f.write(newTrans + '\n')
                  elif (transaction == "logout"):
                        f.close()
                        running = False
                  else:
                        print "Please enter a valid transaction
type."
            return False

########################################################################
#####################################

def openBankingSystem():
      loggedIn = True
      while (loggedIn):
            #GETS LOGIN TO START, STAGE 0
            firstInput = raw_input('Type "login" to login: ')
            firstInput.lower()
            if (firstInput == "login"):
                  pickDay = True
                  while (pickDay):
                        #ACCEPTS INPUT FOR AGENT OR RETAIL, STAGE 1
                        dayType = raw_input('agent or retail: ')
                        dayType.lower()
                        if (dayType == "retail"):
                              pickDay = False
```

```
                              retailDay = retail(dayType,0)
                              loggedIn = retailDay.runRetailDay()
                        elif (dayType == "agent"):
                              pickDay = False
                              agentDay = agent(dayType)
                              loggedIn = agentDay.runAgentDay()
                        else:
                              print "Please enter a valid input.\n"
            else:
                  print "Please enter a valid input.\n"
      #STARTS OVER AGAIN AFTER LOGOUT AT STAGE 0
      return openBankingSystem()

######      MAIN PROGRAM      ######
#open current accounts file
openBankingSystem()
#close curren accounts file

#ERROR AND TODO LOG
#wont accept any whitespace on string
#methods in each agent and retail
#code needs comments and variable names may need work
```