

ATM SIMULATOR

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INTRODUCTION

We have built an ATM simulator system for our project. We have tried our best to make the complicated process of ATM simulation as simple as possible using structured and modular technique , OOPs concepts.

We have tried to keep our UI as user friendly as possible. We have used a menu-oriented interface. We have tried to design the project in such a way that the users may not have any difficulty in using this package & the primary concern also being the code

maintainability for the easy reuse of the code and thus the extension is possible without much efforts.

Primary objective of this project is to simplify and automate the day-to-day activities of a bank like making deposits, withdrawing cash , fund transfer, etc. We have tried to make our simulator as efficient as possible .

We have also tried to make the design easy to understand so that our simulator can be easily modified in the near future. By cleanly arranging parts of our code which correspond to the multiple functions, we have created an elaborate yet easy-to-understand code.

We have tried our best to implicate the working of a regular bank and provide basic operations to our user.

OPERATIONS

Our project provides the following main operations.

- Withdrawal
- transfer
- Balance enquiry
- Deposit cash
- PIN change
- Log out

OBJECTIVE

- To create a computer based system which can handle day-to-day processes that take place in an ATM.
- The project aims to make the process of banking a user-friendly experience, so that more people are accustomed to such systems in the upcoming days.
- Each user has their own user ID , i.e , their card number(which is unique of-course). The user can access all his account details simply by entering the card number and the corresponding PIN
- The system created is secure, hence only the authorized user can access his/her account.

- The process of making withdrawals and deposits is made as easy as possible. The user only has to worry about the amount in case of withdrawals and deposits and the account he wants to transfer to in case of fund transfer.
- Data of all transactions is stored in a separate database which can be accessed by the administrator only.
(However, we could not implement this using file handling due to shortage of time. So we used a vector of vectors instead)
- We have also tried to design our project in such a way that our code , which runs the simulator, can be easily modified depending on how the client wants to use it.
- Our structured approach aides in extension of this software when needed. The client which uses this software can easily change the functionality of the code to suit his needs.

REQUIREMENTS:

- A Data-base to store the data
- The Customer will be required to insert the ATM card
- and enter a personal identification number (PIN)
- both the card and the PIN will be required to be subjected to verification as part of each transaction.
- The customer will be required to enter the amount for the transactions such as deposition, withdrawal, fund transfer
- In case the customer wants to change the PIN , he will be required to enter the existing PIN and also the new PIN

DATA BASE:

We basically stored the following data:

- 1.Name of the account holder
- 2.Card Number
- 3.PIN
- 4.Account Balance

in a vector of vectors

This is the storage of the data in the bank server. We then accessed these data to carry out the operations/transactions. The modified data is updated.

NAME	CARD NUMBER	PIN	ACCOUNT BALANCE(IN RS.)
Eren Yeager	100000	1234	890933
Mikasa Ackerman	100001	1235	89065
Armin Arlert	100002	1236	8903359
Levi Ackerman	100003	1237	890942
Ross Geller	100004	1238	89049
Monica Geller	100005	1239	89096
Rachel Green	100006	1230	80955
Pheobe Buffay	100007	1231	90934
Chandler Bing	100008	1232	44909
Joey Tribbiani	100009	1233	8509

DESIGN:

We created a vector of vector in the class Bank(which is also the superclass of all the classes) which stores all the data like a database. The data -base was made private in Bank so that no other class or any other function can access it , thus ensuring the security. The class bank was then derived by the other classes to carry out the transactions. The verification of the card and the pin happens in the class Atm(Class Atm makes a call to the class Bank where the verification takes place).

Class Operations plays an important role in our design. It is this class that contains all the virtual functions that are necessary to carry out the transactions. These virtual functions that were derived by the classes Deposit, Withdrawal, Change PIN,

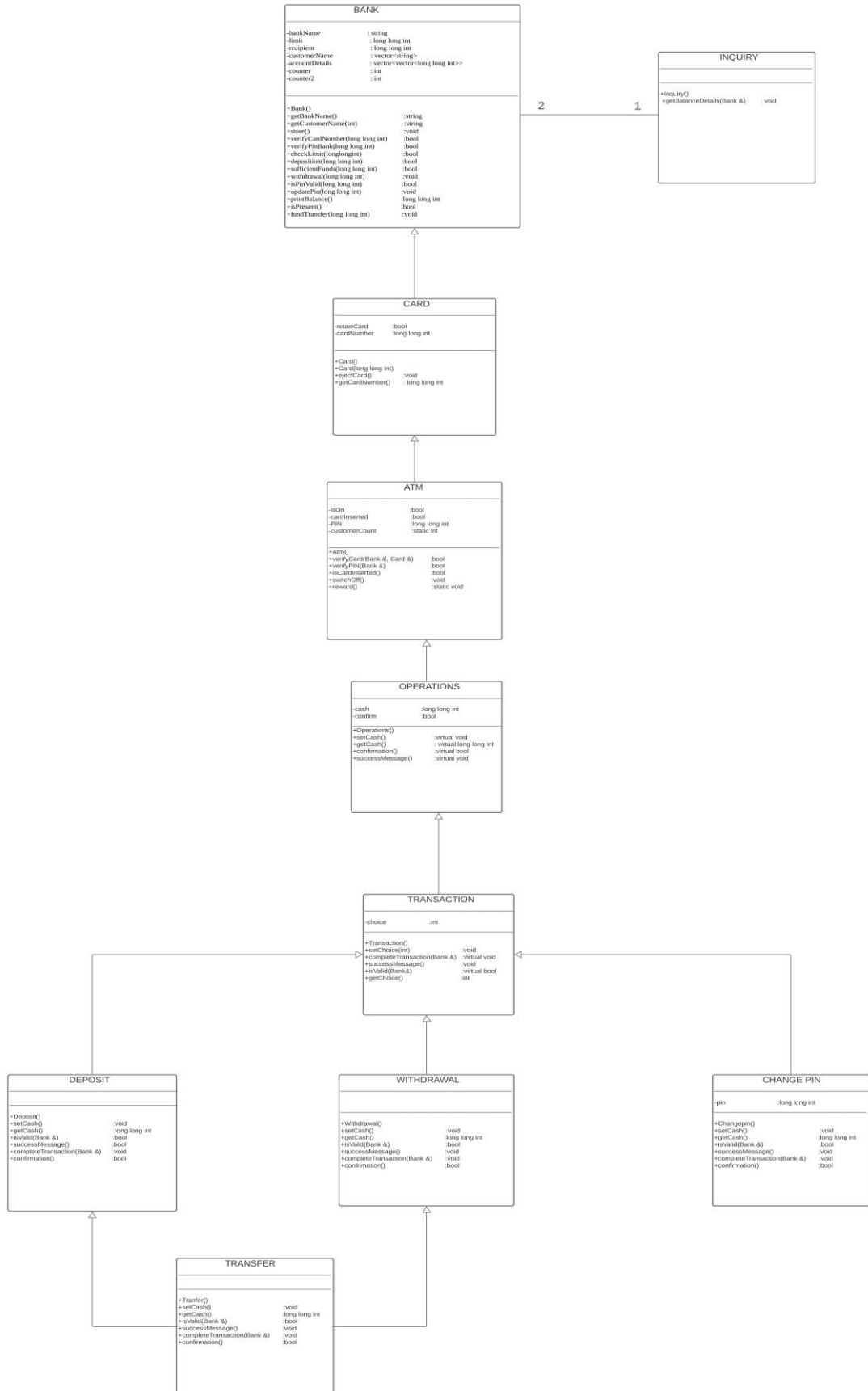
Transfer did were overridden thus keeping the code DRY.

We also used virtual inheritance to solve the diamond problem that arises when the grand-child class inherited properties from the parent classes Withdrawal and Deposit which in-turn inherited the properties from the grand-parent class Transactions. Thus only one copy of the variables in the grand-parent class was maintained in the grand-child class.

DIAGRAMS:

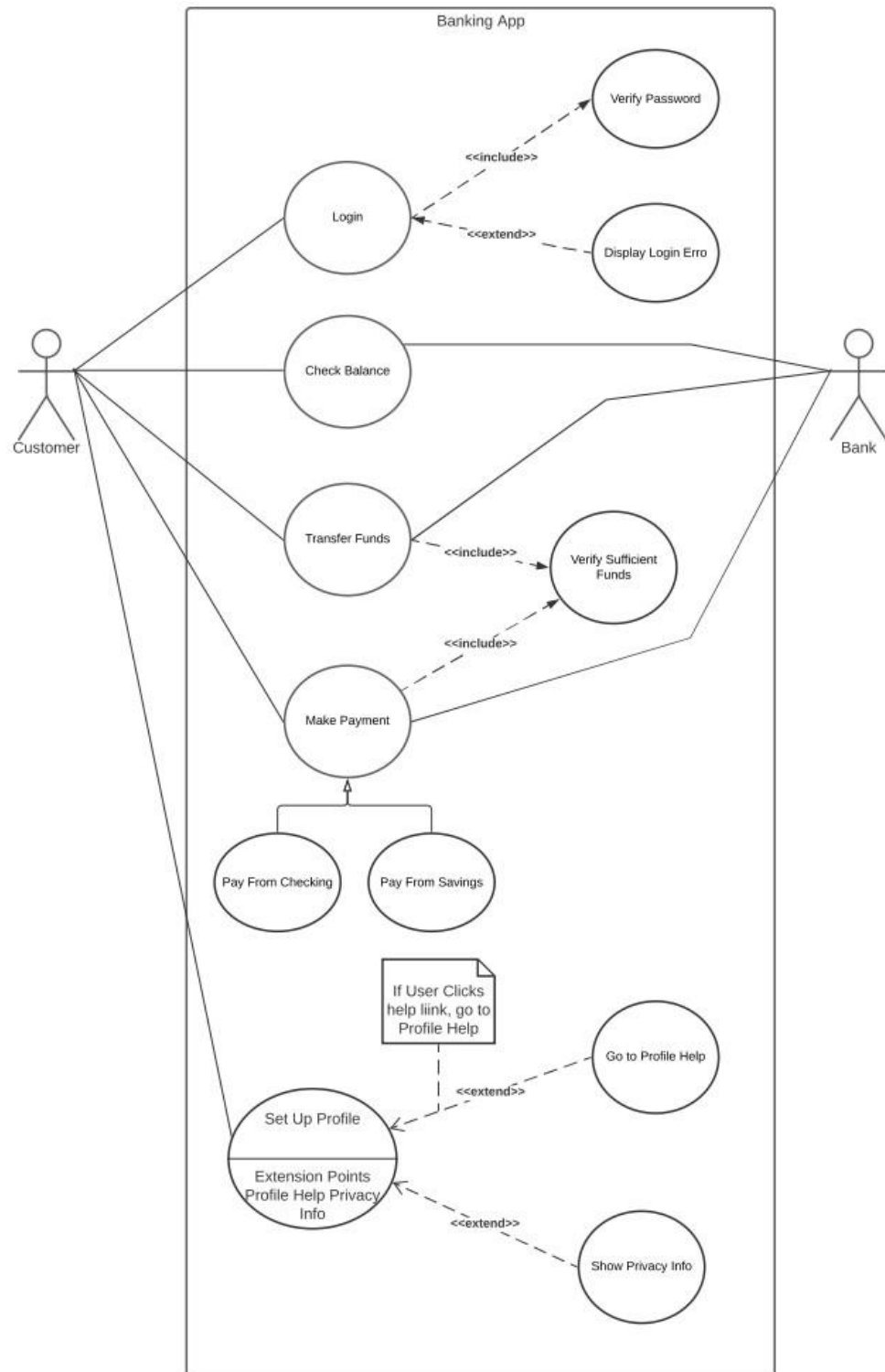
1.STRUCTURAL DIAGRAM

1.1.STATE DIAGRAM

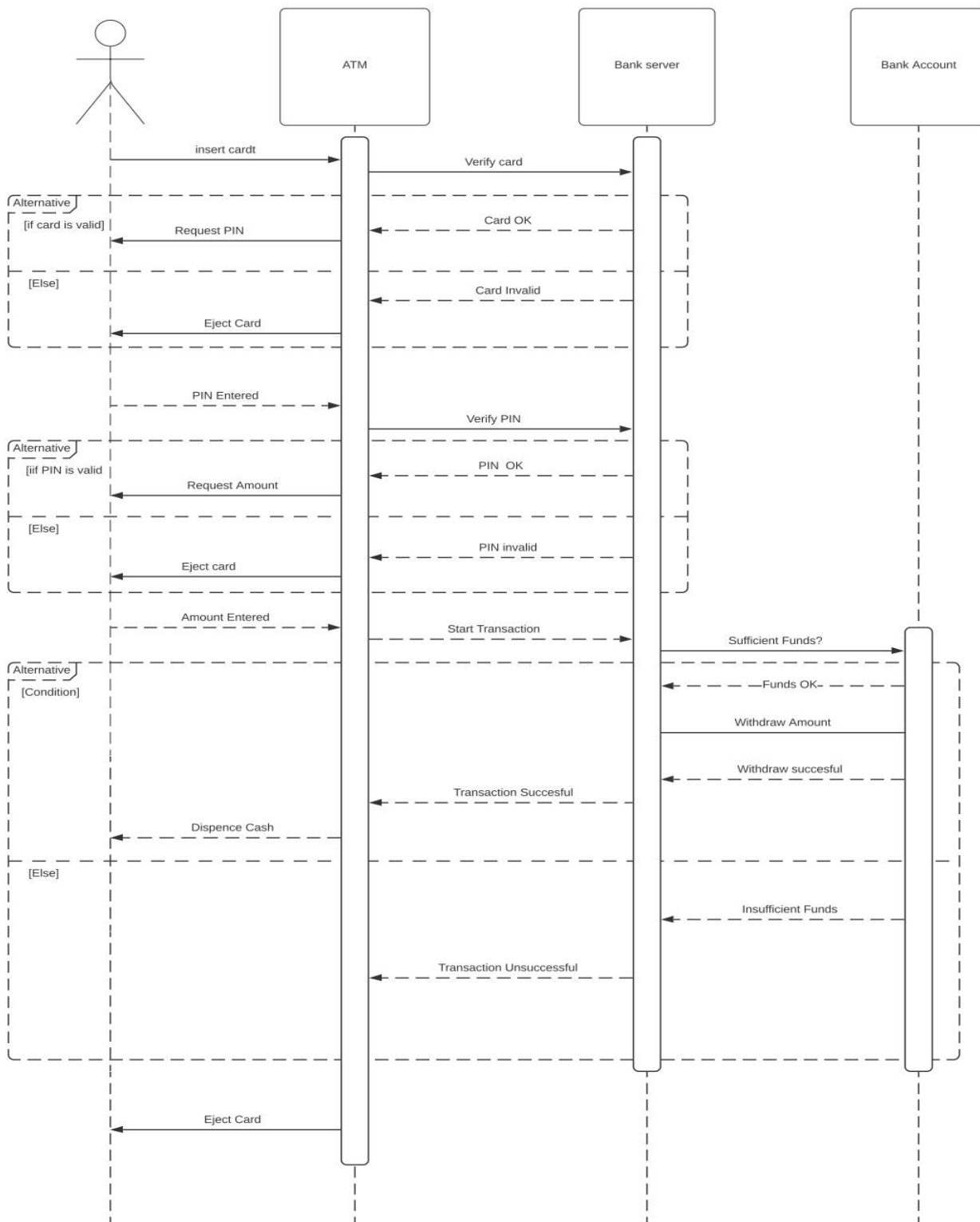


2.BEHAVIORAL DIAGRAMS:

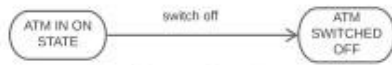
2.1 USE CASE DIAGRAM



2.2.SEQUENCE DIAGRAM:



2.3.STATE DIAGRAM



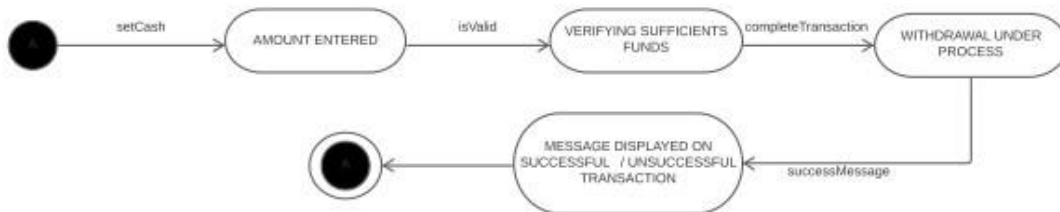
State diagram for ATM



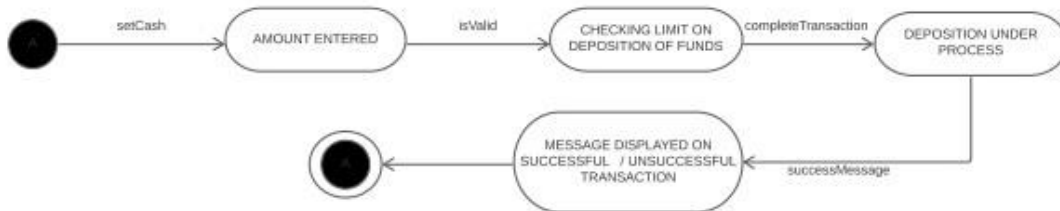
State diagram for Card



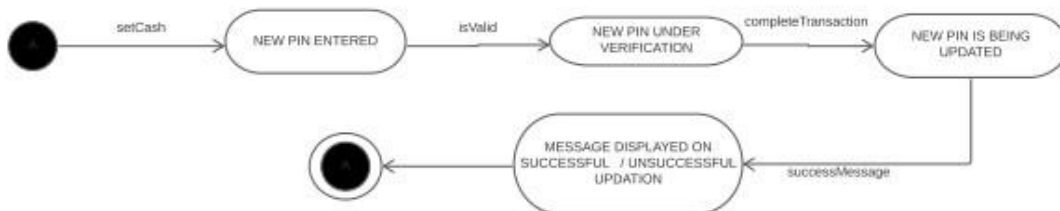
State diagram for Bank



State diagram for Withdrawal

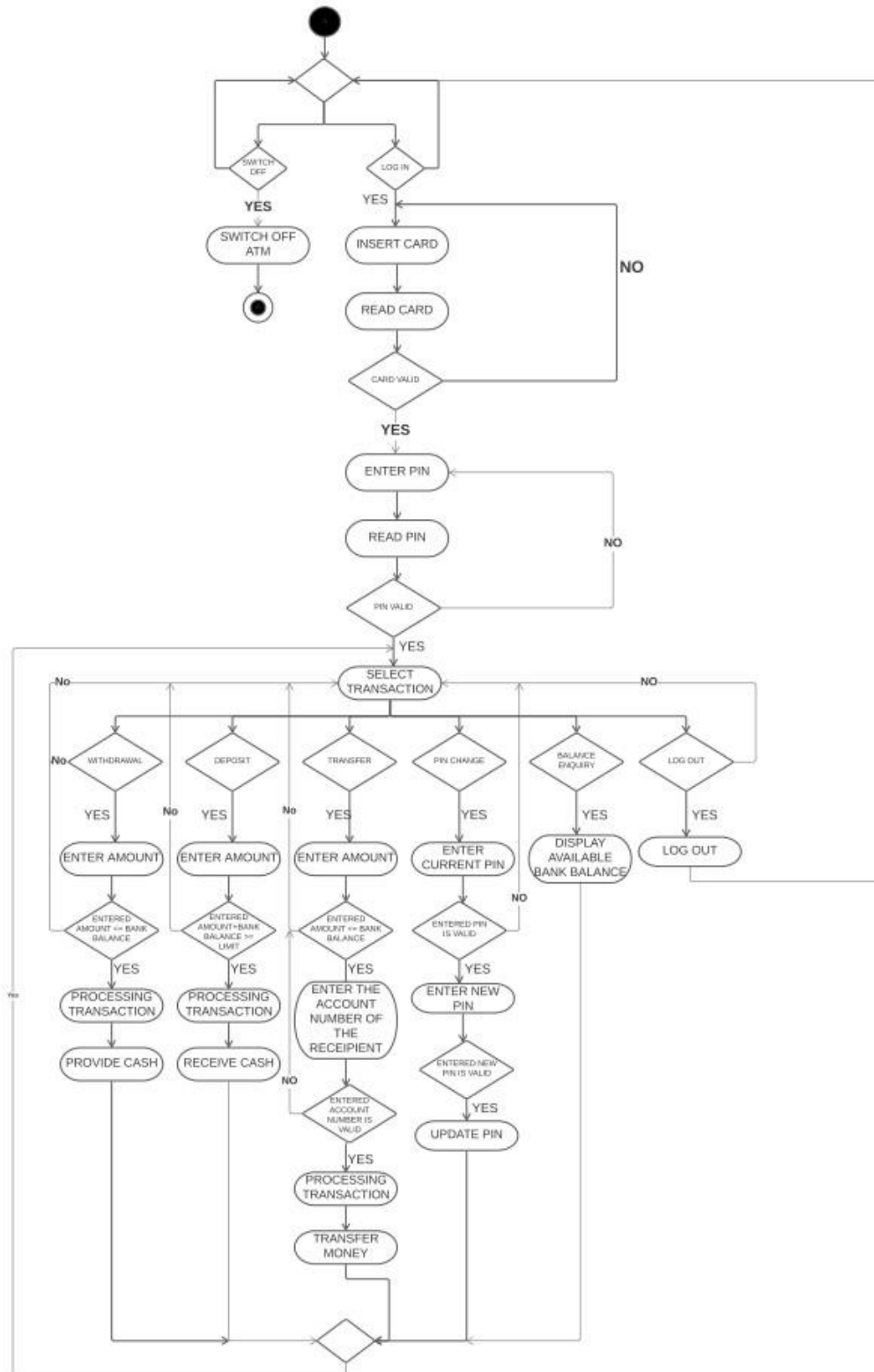


State diagram for Deposit

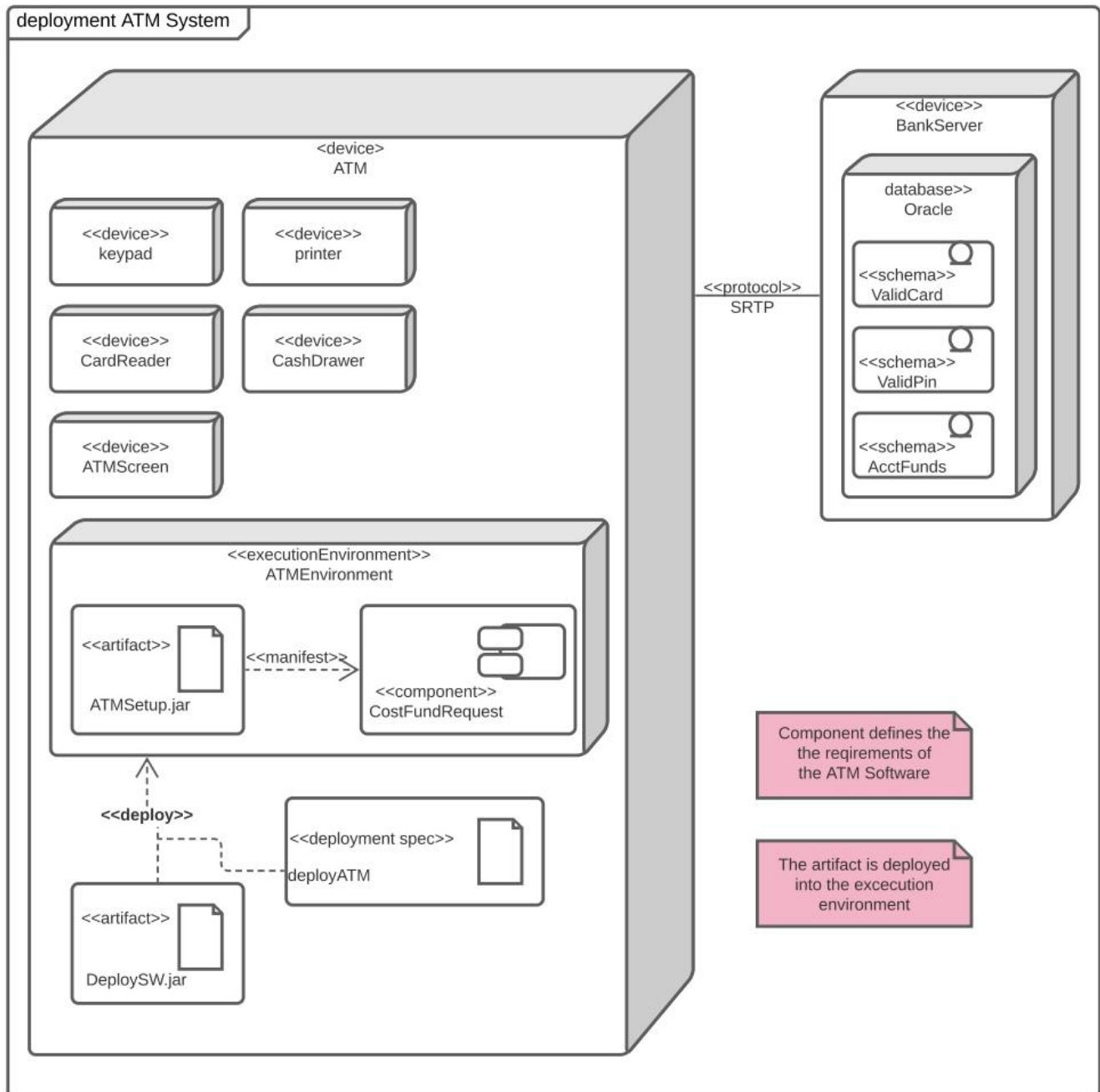


State diagram for Change pin

2.4. ACTIVITY DIAGRAM



DEPLOYMENT DIAGRAM



OUTPUT:

1.LOGIN:(INVALID CARD)

BANK OF IIITL

WELCOME!!

WHAT WOULD YOU LIKE TO DO?

1.LOGIN

2.SWITCH OFF ATM

1

BANK OF IIITL

PLEASE INSERT YOUR CARD HERE(Enter Your Card Number):

90023

BANK OF IIITL

PLEASE WAIT!!

READING THE CARD

BANK OF IIITL

SORRY

SEEMS LIKE YOU HAVE ENTERED THE WRONG CARD NUMBER :(
PLEASE TRY AGAIN!!!

2.LOGIN:(VALID CARD)

BANK OF IIITL

WELCOME!!

WHAT WOULD YOU LIKE TO DO?

1.LOGIN

2.SWITCH OFF ATM

1

BANK OF IIITL

PLEASE INSERT YOUR CARD HERE(Enter Your Card Number):

100000

BANK OF IIITL

PLEASE WAIT!!
READING THE CARD

BANK OF IIITL

Hello, Eren Yeager. Welcome to the BANK OF IIITL !!!

3.LOGIN:(PIN VERIFICATION)

BANK OF IIITL

Hello, Eren Yeager. Welcome to the BANK OF IIITL !!!

PLEASE ENTER YOUR 4 DIGIT PIN

1245

BANK OF IIITL

WRONG PIN!!!

PLEAE TRY AGAIN
YOU HAVE 2 ATTEMPTS

PLEASE ENTER YOUR 4 DIGIT PIN

1234

BANK OF IIITL

YOU HAVE BEEN LOGGED IN SUCCESSFULLY

4.OPERATIONS:

4.1.WITHDRAWAL

BANK OF IIITL

WHAT WOULD YOU LIKE TO DO:

- | | |
|-------------------|-----------------|
| 1.WITHDRAWAL | 2.FUND TRANSFER |
| 3.BALANCE INQUIRY | 4.DEPOSIT CASH |
| 5.PIN CHANGE | 6.LOG OUT |

1

BANK OF IIITL

YOUR CHOICE HAS BEEN ENTERED SUCCESSFULLY

BANK OF IIITL

YOU HAVE SELECTED WITHDRAWAL.

DO YOU WISH TO PROCEED

- 1.YES,PROCEED
- 2.NO

1

BANK OF IIITL

WITHDRAWAL: PLEASE ENTER THE AMOUNT

1234555555

BANK OF IIITL

YOU HAVE ENTERED 1234555555.
DO YOU WISH TO PROCEED
1.YES,PROCEED
2.NO,LET ME ENTER THE AMOUNT AGAIN

1

BANK OF IIITL

ENTERED AMOUNT IS GREATER THAN THE BALANCE AMOUNT!!
YOUR ACCOUNT HAS INSUFFICIENT BALANCE
SORRY CANNOUT PROCESS!!

BANK OF IIITL

WHAT WOULD YOU LIKE TO DO:

1.WITHDRAWAL	2.FUND TRANSFER
3.BALANCE INQUIRY	4.DEPOSIT CASH
5.PIN CHANGE	6.LOG OUT

1

BANK OF IIITL

YOUR CHOICE HAS BEEN ENTERED SUCCESSFULLY

YOU HAVE SELECTED WITHDRAWAL.

DO YOU WISH TO PROCEED
1.YES,PROCEED
2.NO

1

BANK OF IIITL

WITHDRAWAL: PLEASE ENTER THE AMOUNT

1234

BANK OF IIITL

YOU HAVE ENTERED 1234.

DO YOU WISH TO PROCEED

1.YES,PROCEED

2.NO,LET ME ENTER THE AMOUNT AGAIN

1

BANK OF IIITL

AFTER THE TRANSACTION, YOUR CURRENT BALANCE IS 889699

PROCESSING

THE AMOUNT 1234 HAS BEEN DEBITED FROM YOUR ACCOUNT SUCCESSFULLY!!

PLEASE COLLECT THE CASH!!

4.2.FUND TRANSFER

BANK OF IIITL

WHAT WOULD YOU LIKE TO DO:

- | | |
|-------------------|-----------------|
| 1.WITHDRAWAL | 2.FUND TRANSFER |
| 3.BALANCE INQUIRY | 4.DEPOSIT CASH |
| 5.PIN CHANGE | 6.LOG OUT |

2

BANK OF IIITL

YOUR CHOICE HAS BEEN ENTERED SUCCESSFULLY

BANK OF IIITL

FUND TRANSFER: PLEASE ENTER THE AMOUNT

1000

BANK OF IIITL

YOU HAVE ENTERED 1000.

DO YOU WISH TO PROCEED

- 1.YES,PROCEED
2.NO,LET ME ENTER THE AMOUNT AGAIN

1

BANK OF IIITL

ENTER THE ACCOUNT NUMBER OF THE RECIEPIENT:

100001

BANK OF IIITL

AFTER THE TRANSACTION, YOUR CURRENT BALANCE IS 889933

PROCESSING

THE AMOUNT 1000 HAS BEEN DEBITED FROM YOUR ACCOUNT AND CREDITED TO THE RECEIPTANT ACCOUNT SUCCESSFULLY!!!

4.3.BALANCE INQUIRY

BANK OF IIITL

WHAT WOULD YOU LIKE TO DO:

- | | |
|-------------------|-----------------|
| 1.WITHDRAWAL | 2.FUND TRANSFER |
| 3.BALANCE INQUIRY | 4.DEPOSIT CASH |
| 5.PIN CHANGE | 6.LOG OUT |

3

BANK OF IIITL

YOUR CHOICE HAS BEEN ENTERED SUCCESSFULLY

BANK OF IIITL

YOU HAVE SELECTED BALANCE ENQUIRY.

DO YOU WISH TO PROCEED

- 1.YES,PROCEED
2.NO

1

YOUR AVAILABLE BANK BALANCE IS: 889933

4.4.PIN CHANGE:

BANK OF IIITL

WHAT WOULD YOU LIKE TO DO:

1.WITHDRAWAL

2.FUND TRANSFER

3.BALANCE INQUIRY

4.DEPOSIT CASH

5.PIN CHANGE

6.LOG OUT

5

BANK OF IIITL

YOUR CHOICE HAS BEEN ENTERED SUCCESSFULLY

BANK OF IIITL

YOU HAVE SELECTED PIN CHANGE.

DO YOU WISH TO PROCEED

1.YES,PROCEED

2.NO

1

PLEASE ENTER YOUR 4 DIGIT PIN

1234

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-----  
BANK OF IIITL  
  
ENTER YOUR NEW 4-DIGIT PIN:  
  
1000  
-----  
BANK OF IIITL  
  
YOU HAVE ENTERED 1000 AS YOUR NEW PIN.  
  
DO YOU WISH TO PROCEED  
1.YES,PROCEED  
2.NO,LET ME ENTER IT AGAIN  
  
1  
  
YOUR PIN WAS CHANGED SUCCESSFULLY!!  
PLEASE REMEMBER TO USE THE NEWLY UPDATED PIN FROM NEXT TIME  
-----
```

TRYING TO LOG-IN WITH THE OLD AND NEWLY UPDATED PIN:

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-----  
BANK OF IIITL  
  
Hello, Eren Yeager. Welcome to the BANK OF IIITL !!!  
  
PLEASE ENTER YOUR 4 DIGIT PIN  
  
1234  
-----  
-----  
BANK OF IIITL  
  
WRONG PIN!!!  
  
PLEAE TRY AGAIN  
YOU HAVE 2 ATTEMPTS  
  
PLEASE ENTER YOUR 4 DIGIT PIN
```

BANK OF IIITL

WRONG PIN!!!

PLEASE TRY AGAIN

YOU HAVE 2 ATTEMPTS

PLEASE ENTER YOUR 4 DIGIT PIN

1000

BANK OF IIITL

YOU HAVE BEEN LOGGED IN SUCCESSFULLY

4.5.DEPOSIT:

BANK OF IIITL

WHAT WOULD YOU LIKE TO DO:

1.WITHDRAWAL

2.FUND TRANSFER

3.BALANCE INQUIRY

4.DEPOSIT CASH

5.PIN CHANGE

6.LOG OUT

4

BANK OF IIITL

YOUR CHOICE HAS BEEN ENTERED SUCCESSFULLY

BANK OF IIITL

YOU HAVE SELECTED DEPOSIT.

DO YOU WISH TO PROCEED

1.YES,PROCEED

2.NO

1

BANK OF IIITL

YOU HAVE ENTERED 1000.

DO YOU WISH TO PROCEED

1.YES,PROCEED

2.NO,LET ME ENTER THE AMOUNT AGAIN

1

BANK OF IIITL

AFTER THE TRANSACTION, YOUR CURRENT BALANCE IS 891933

PROCESSING

THE AMOUNT 1000 HAS BEEN CREDITED TO YOUR BANK ACCOUNT SUCCESSFULLY!!

4.6.LOG-OUT:

BANK OF IIITL

WHAT WOULD YOU LIKE TO DO:

1.WITHDRAWAL

2.FUND TRANSFER

3.BALANCE INQUIRY

4.DEPOSIT CASH

5.PIN CHANGE

6.LOG OUT

6

BANK OF IIITL

YOUR CHOICE HAS BEEN ENTERED SUCCESSFULLY

BANK OF IIITL

DO YOU WISH TO LOGOUT?

1.YES, LOGOUT

2.NO

1

BANK OF IIITL

YOU HAVE BEEN LOGGED OUT SUCCESSFULLY!!

PLEASE DON'T FORGET TO TAKE YOUR ATM CARD WITH YOU

THANK YOU!! VISIT AGAIN

4.SWITCH-OFF ATM:

BANK OF IIITL

WELCOME!!

WHAT WOULD YOU LIKE TO DO?

1.LOGIN

2.SWITCH OFF ATM

2

BANK OF IIITL

DO YOU REALLY WISH TO SWITCH OFF THE ATM:

1.YES,SWITCH OFF

2.NO

1

BANK OF IIITL

SWITCHING OFF THE ATM!!

CONCLUSION:

In the process of building this project we have learned and applied various OOPS concepts. This has helped us gain a better understanding of concepts like inheritance, structured programming, designing, problem solving and building simple algorithms.

Learning through application of concepts is definitely the best way to learn . While working on this project we were also able to familiarize ourselves with the various UML diagrams and understand the importance of designing.

Working together as a team made the task exponentially easier and helped us gain an understanding of each other's weaknesses and strengths. Overall it was a great learning and experience and we look forward to working on such projects in the future.