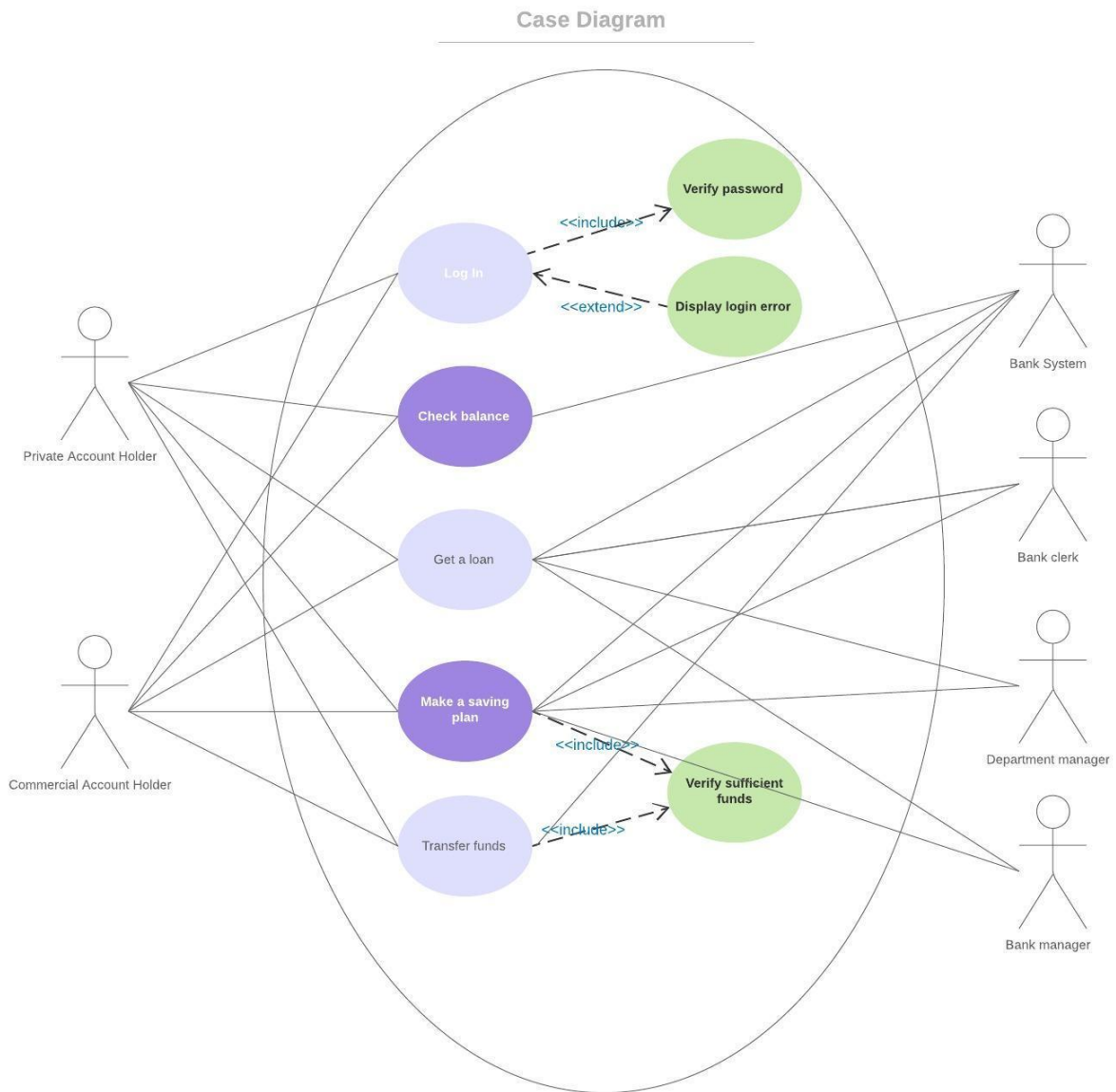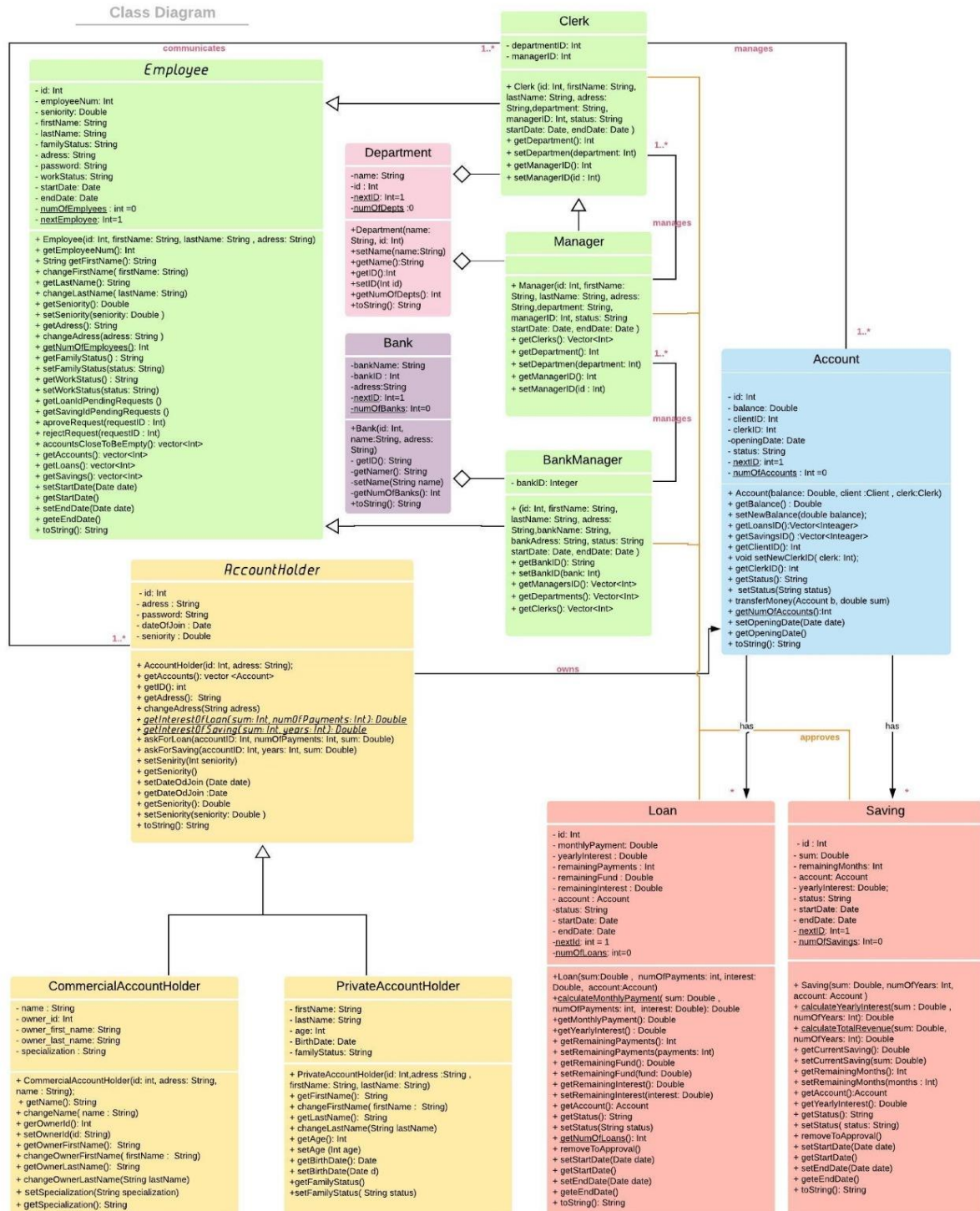**תרגיל 3 – שלב הניתוח**

1. Use Case Diagram

2. Class Diagram

Class Diagram

Employee

- id: Int
- employeeNum: Int
- seniority: Double
- firstName: String
- lastName: String
- familyStatus: String
- adress: String
- password: String
- workStatus: String
- startDate: Date
- endDate: Date
- numOfEmployees : int =0
- nextEmployee: Int=1

+ Employee(id: Int, firstName: String, lastName: String , adress: String)
+ getEmployeeNum(): Int
+ String getFirstName(): String
+ changeFirstName(firstName: String)
+ getLastName(): String
+ changeLastName(lastName: String)
+ getSeniority(): Double
+ setSeniority(seniority: Double)
+ getAdress(): String
+ changeAdress(adress: String)
+ getNumOfEmployees(): Int
+ getFamilyStatus() : String
+ setFamilyStatus(status: String)
+ getWorkStatus() : String
+ setWorkStatus(status: String)
+ getLoanIdPendingRequests ()
+ getSavingIdPendingRequests ()
+ aproveRequest(requestID : Int)
+ rejectRequest(requestID : Int)
+ accountsCloseToBeEmpty(): vector<Int>
+ getAccounts(): vector<Int>
+ getLoans(): vector<Int>
+ getSavings(): vector<Int>
+ setStartDate(Date date)
+ getStartDate()
+ setEndDate(Date date)
+ geteEndDate()
+ toString(): String

Clerk

- departmentID: Int
- managerID: Int

+ Clerk (id: Int, firstName: String, lastName: String, adress: String,department: String, managerID: Int, status: String startDate: Date, endDate: Date)
+ getDepartment(): Int
+ setDepartmen(department: Int)
+ getManagerID(): Int
+ setManagerID(id : Int)

Department

-name: String
-id : Int
-nextID: Int=1
-numOfDepts :0

+Department(name: String, id: Int)
+setName(name:String)
+getName():String
+getID():Int
+setID(Int id)
+getNumOfDepts(): Int
+toString(): String

Manager

+ Manager(id: Int, firstName: String, lastName: String, adress: String ,department: String, managerID: Int, status: String startDate: Date, endDate: Date)
+ getClerks(): Vector<Int>
+ getDepartment(): Int
+ setDepartmen(department: Int)
+ getManagerID(): Int
+ setManagerID(id : Int)

Bank

-bankName: String
-bankID : Int
-adress:String
-nextID: Int=1
-numOfBanks: Int=0

+Bank(id: Int, name:String, adress: String)
- getID(): String
- getNamer(): String
- setName(String name)
- getNumOfBanks(): Int
+toString(): String

BankManager

- bankID: Integer

+ (id: Int, firstName: String, lastName: String, adress: String ,bankName: String, bankAdress: String, status: String startDate: Date, endDate: Date)
+ getBankID(): String
+ setBankID(bank: Int)
+ getManagersID(): Vector<Int>
+ getDepartments(): Vector<Int>
+ getClerks(): Vector<Int>

Account

- id: Int
- balance: Double
- clientID: Int
- clerkID: Int
- openingDate: Date
- status: String
- nextID: int=1
- numOfAccounts : Int =0

+ Account(balance: Double, client :Client , clerk:Clerk)
+ getBalance() : Double
+ setNewBalance(double balance);
+ getLoansID():Vector<Inteager>
+ getSavingsID() :Vector<Inteager>
+ getClientID(): Int
+ void setNewClerkID(clerk: Int);
+ getClerkID(): Int
+ getStatus(): String
+ setStatus(String status)
+ transferMoney(Account b, double sum)
+ getNumOfAccounts():Int
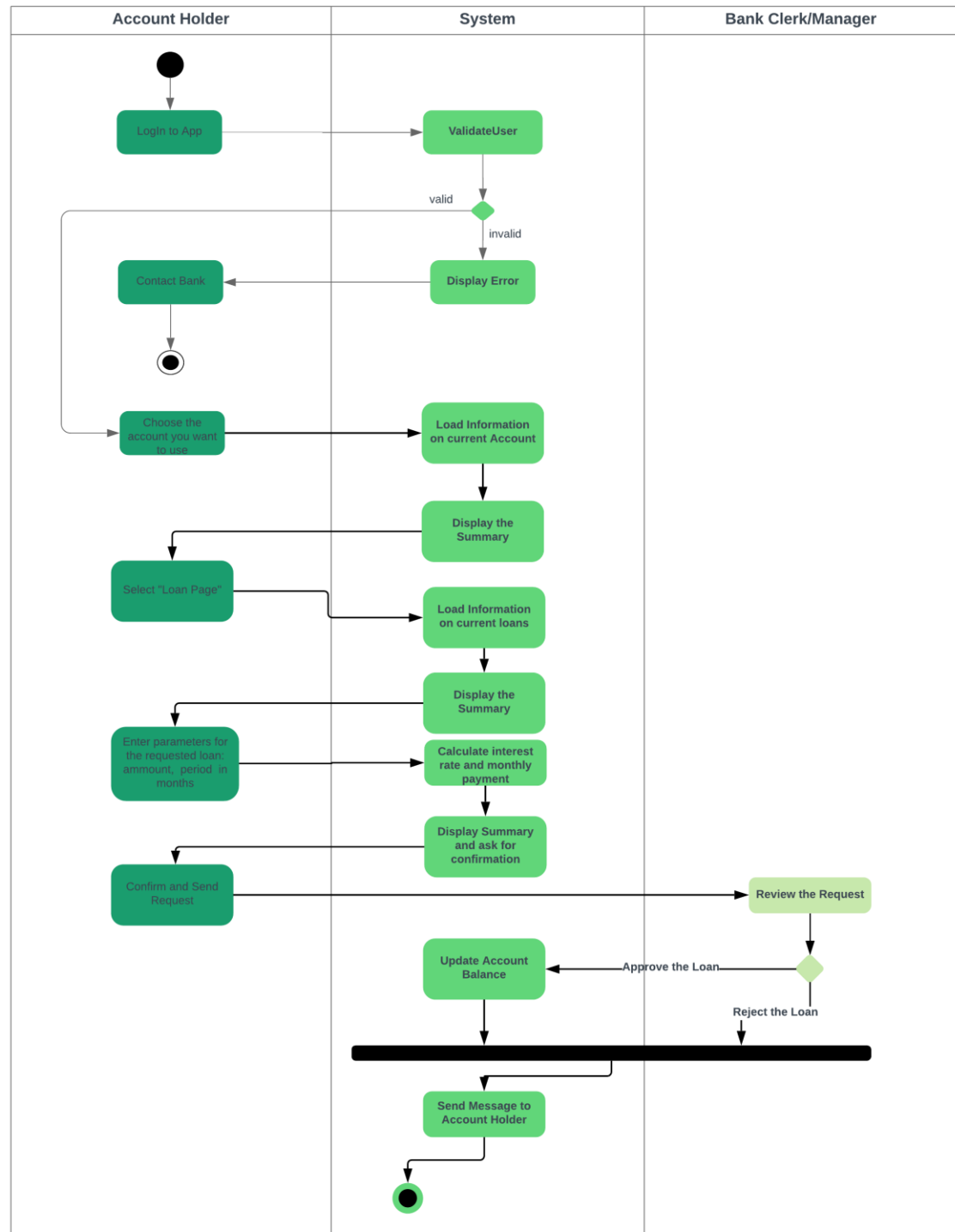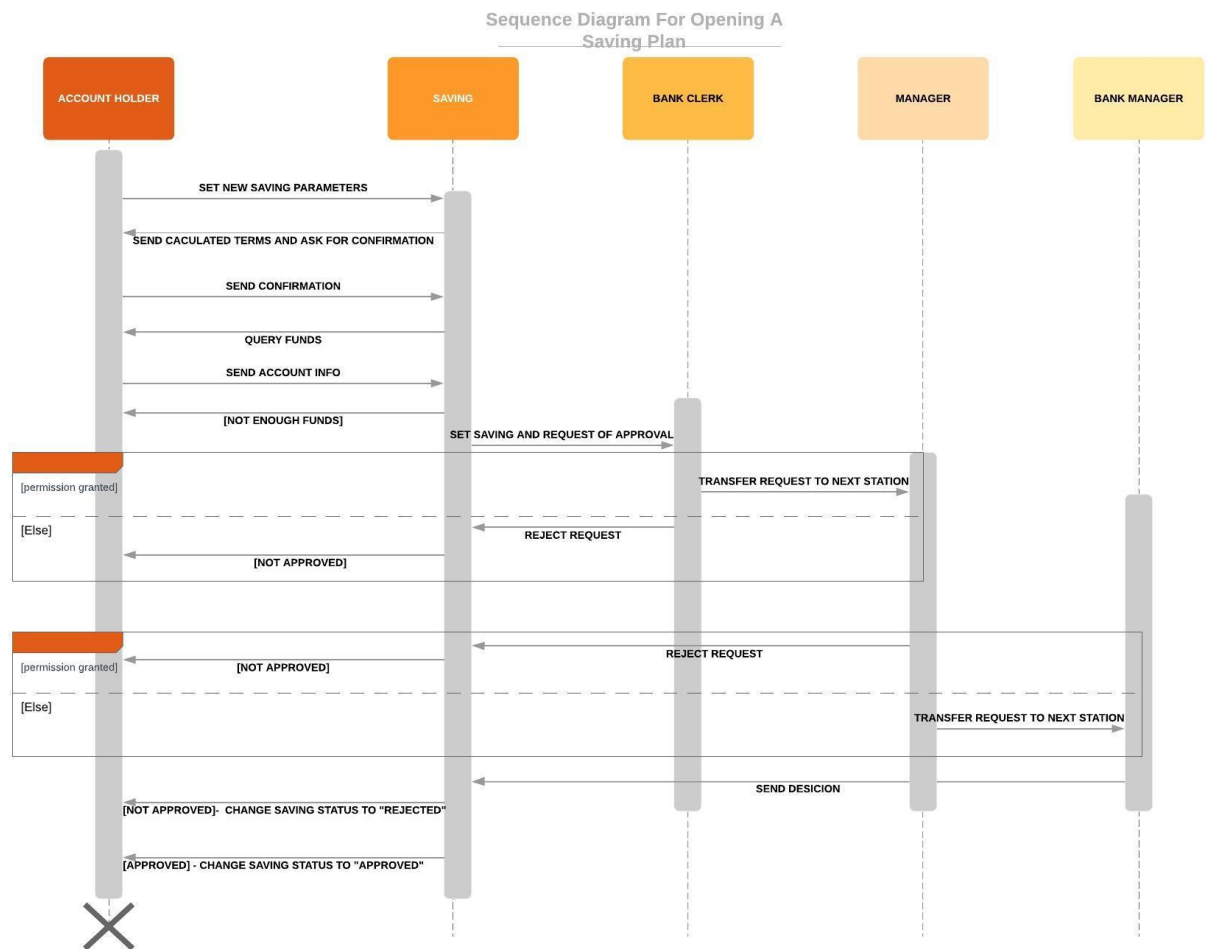+ setOpeningDate(Date date)
+ getOpeningDate()
+ toString(): String

AccountHolder

- id : Int
- adress : String
- password: String
- dateOfJoin : Date
- seniority : Double

+ AccountHolder(id: Int, adress: String);
+ getAccounts(): vector <Account>
+ getID(): int
+ getAdress(): String
+ changeAdress(String adress)
+ getInterestOfLoan(sum: Int, numOfPayments: Int): Double
+ getInterestOfSaving(sum: Int, years: Int): Double
+ askForLoan(accountID: Int, numOfPayments: Int, sum: Double)
+ askForSaving(accountID: Int, years: Int, sum: Double)
+ setSenirity(Int seniority)
+ getSenirity()
+ setDateOdJoin (Date date)
+ getDateOdJoin :Date
+ getSeniority(): Double
+ setSeniority(seniority: Double)
+ toString(): String

Loan

- id: Int
- monthlyPayment: Double
- yearlyInterest : Double
- remainingPayments : Int
- remainingFund : Double
- remainingInterest : Double
- account : Account
-status: String
- startDate: Date
- endDate: Date
-nextId: int = 1
-numOfLoans: int=0

+Loan(sum:Double , numOfPayments: int, interest: Double, account:Account)
+calculateMonthlyPayment(sum: Double , numOfPayments: int, interest: Double): Double
+getMonthlyPayment(): Double
+getYearlyInterest(): Double
+ getRemainingPayments(): Int
+ setRemainingPayments(payments: Int)
+ getRemainingFund(): Double
+ setRemainingFund(fund: Double)
+ getRemainingInterest(): Double
+ setRemainingInterest(interest: Double)
+ getAccount(): Account
+ getStatus(): String
+ setStatus(String status)
+ getNumOfLoans(): Int
+ removeToApproval()
+ setStartDate(Date date)
+ getStartDate()
+ setEndDate(Date date)
+ geteEndDate()
+ toString(): String

Saving

- id : Int
- sum: Double
- remainingMonths: Int
- account: Account
- yearlyInterest: Double;
- status: String
- startDate: Date
- endDate: Date
- nextID: Int=1
- numOfSavings: Int=0

+ Saving(sum: Double, numOfYears: Int, account: Account)
+ calculateYearlyInterest(sum : Double , numOfYears: Int): Double
+ calculateTotalRevenue(sum: Double, numOfYears: Int): Double
+ getCurrentSaving(): Double
+ setCurrentSaving(sum: Double)
+ getRemainingMonths(): Int
+ setRemainingMonths(months : Int)
+ getAccount():Account
+ getYearlyInterest(): Double
+ getStatus(): String
+ setStatus(status: String)
+ removeToApproval()
+ setStartDate(Date date)
+ getStartDate()
+ setEndDate(Date date)
+ geteEndDate()
+ toString(): String

CommercialAccountHolder

- name : String
- owner_id: Int
- owner_first_name: String
- owner_last_name: String
- specialization : String

+ CommercialAccountHolder(id: int, adress: String, name : String);
+ getName()
+ changeName(name : String)
+ gerOwnerId(): Int
+ setOwnerId(id: String)
+ getOwnerFirstName(): String
+ changeOwnerFirstName(firstName : String)
+ getOwnerLastName(): String
+ changeOwnerLastName(String lastName)
+ setSpecialization(String specialization)
+ getSpecialization(): String

PrivateAccountHolder

- firstName: String
- lastName: String
- age: Int
- BirthDate: Date
- familyStatus: String

+ PrivateAccountHolder(id: Int,adress :String , firstName: String, lastName: String)
+ getFirstName(): String
+ changeFirstName(firstName : String)
+ getLastName(): String
+ changeLastName(String lastName)
+ getAge(): Int
+ setAge (Int age)
+ getBirthDate(): Date
+ setBirthDate(Date d)
+getFamilyStatus()
+setFamilyStatus(String status)

communicates

manages

1..*

1..*

manages

manages

1..*

owns

has   approves   has

*   *

3. Object Diagram

Luba : Clerk

- id: 329090132
- employeeNum: 87
- seniority: 19
- firstName: Luba
- lastName: Levy
- address: HaRoeh 67, Jerusalem
- password: Pp12345
- workStatus: active
- familyStatus: signle
- startDate: 04/12/1999
- endDate: NULL
- numOfEmplyees : 1053
- nextEmployee: 1054
- departmentID: 31
- managerID: 32

Ori : Manager

- id: 205583214
- employeeNum: 32
- seniority: 30.5
- firstName: Ori
- lastName: Cohen
- address: Hagalil 52, Jerusalem
- password: PmOk965
- workStatus: active
- familyStatus: married
- startDate: 04/06/1988
- endDate: NULL
- numOfEmplyees : 1053
- nextEmployee: 1054
- departmentID: 31
- managerID: 2

Eli : BankManager

- id: 111583214
- employeeNum: 2
- seniority: 40
- firstName: Eli
- lastName: Baranes
- address: Hanegev 34, Jerusalem
- password: sOs987lM
- workStatus: active
- familyStatus: married
- startDate: 04/12/1978
- endDate: NULL
- bankName: Leumi
- bankAddress: Oranim 8, Jerusalem
- numOfEmplyees: 1053
- nextEmployee: 1054
- bankID: 12

Ohad : PrivateAccountHolder

- id: 330201101
- address : Avner 5, Ariel
- password: X9kjs31
- dateOfJoin : 04/06/2015
- seniority : 3.5
- firstName : Ohad
- lastName : Orenstein
- age: 37.5
- BirthDate: 04/06/81
- familyStatus: Married

VIPClients : Department

- name: VIPClients
- id: 31
- nextID: 53
- numOfDepts :52

Acc. 5605 : Account

- id: 5605
- balance: 39821.01
- customerID: 330201101
- clerkID: 87
- openingDate: 17/03/99
- status: active
- nextID: 7234
- numOfAccounts :7233

Loan 718 : Loan

- id: 718
- monthlyPayment: 712.3
- yearlyInterest : 0.12
- remainingPayments : 17
- remainingFund : 11104.2
- remainingInterest : 1004.9
- account : 5605
- status: active
- startDate: 04/11/08
- endDate: 04/05/20
- nextId: 1501
- numOfLoans: 1500

Saving 1743 : Saving

- id : 1743
- sum: 120030.4
- remainingMonths: 31
- account: 5605
- yearlyInterest: 0.02
- status: active
- startDate: 04/07/15
- endDate: 04/07/21
- nextID: 2000
- numOfSavings: 1999

Arieli : Bank

- bankName: Arieli
- bankID: 12
- adress: Havazalot 34, Jerusalem
- nextID: 16
- numOfBanks :15

4. Activity Diagram

Activity Diagram for Loan Request

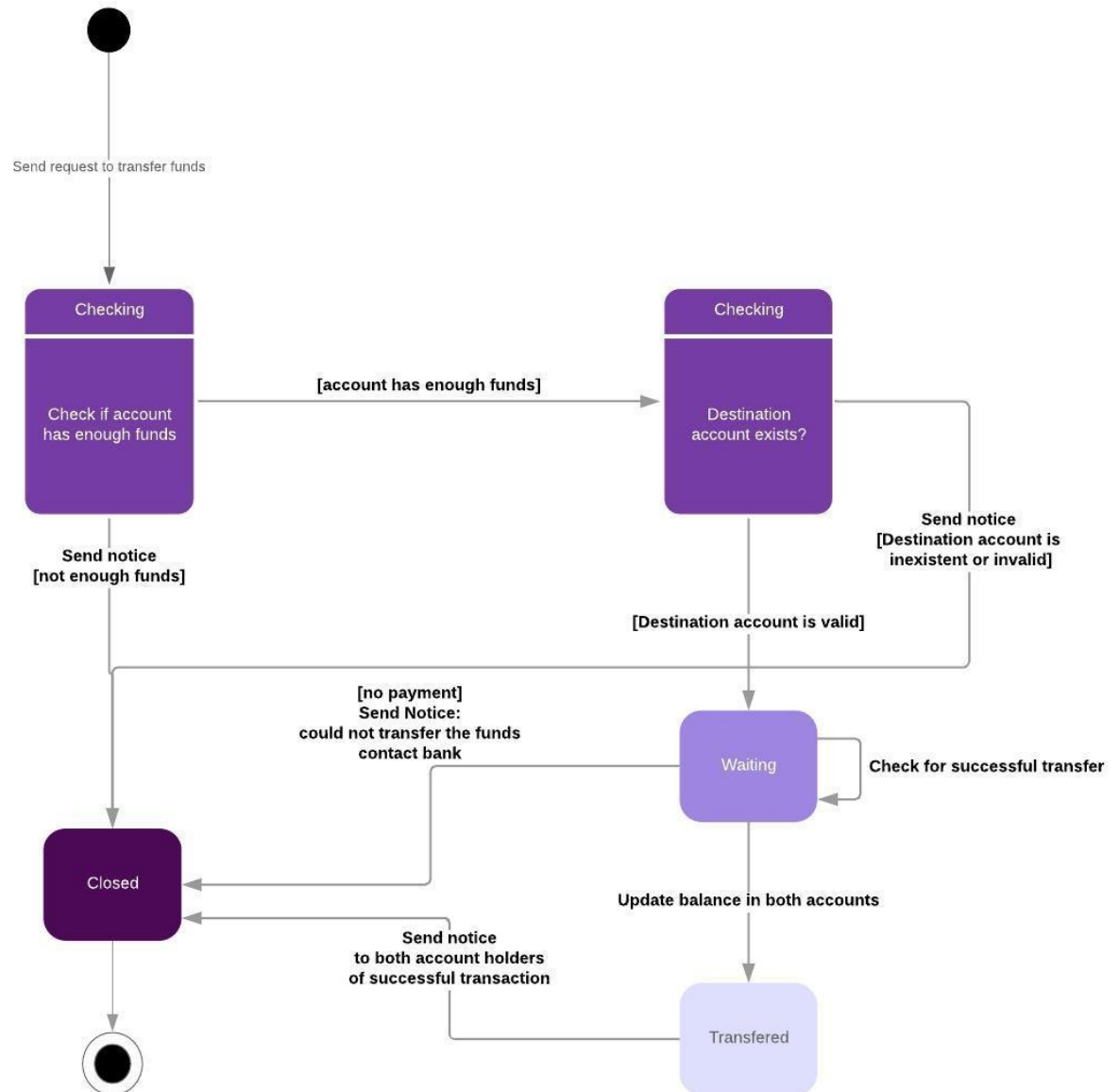**5.** Sequence Diagram

Sequence Diagram For Opening A Saving Plan

6. State Machine Diagram

State Diagram For Transfering Funds

7. ERD

Entity Relationship Diagram

Employee

#	employeeNum	Integer
#	ID	Integer
*	firstName	String
*	lastName	String
o	address	String
*	password	String
*	workStatus	String
*	familyStatus	String
*	startDate	Date
o	endDate	Date
*	seniority	Double

Account Holder

#	clientID	Integer
o	address	String
*	password	String
*	dateOfJoin	Date
*	seniority	Double

Commercial Account Holder

*	companyName	String
*	owner_id	Integer
*	owner_first_name	String
*	owner_last_name	String
o	specialization	String

Private Account Holder

*	firstName	String
*	lastName	String
*	age	Integer
*	BirthDate	Date
*	familyStatus	String

Clerk

*	departmentID	Integer
*	managerID	Integer

Manager

#	departmentID	Integer
*	managerID	Integer

Bank Manager

#	bankID	Integer

Account

#	accountID	Integer
#	clerkID	Integer
#	clientID	Integer
*	openingDate	Date
*	balance	Double
*	status	String

Department

#	id	Integer
#	name	String

Bank

#	id	Integer
#	name	String
o	adress	String

Saving

#	transactionID	Integer
#	accountID	Integer
*	sum	Double
*	startDate	Date
*	endDate	Date
*	remainingMonths	Integer
*	yearlyInterest	Double
*	status	String

Loan

#	transactionID	Integer
#	accountID	Integer
*	startDate	Date
*	endDate	Date
*	montlyPayment	Double
*	yearlyInterest	Double
*	remainingPayments	Integer
*	remainingFund	Double
*	remainingInterest	Double
*	status	String