EXPERIMENT-4

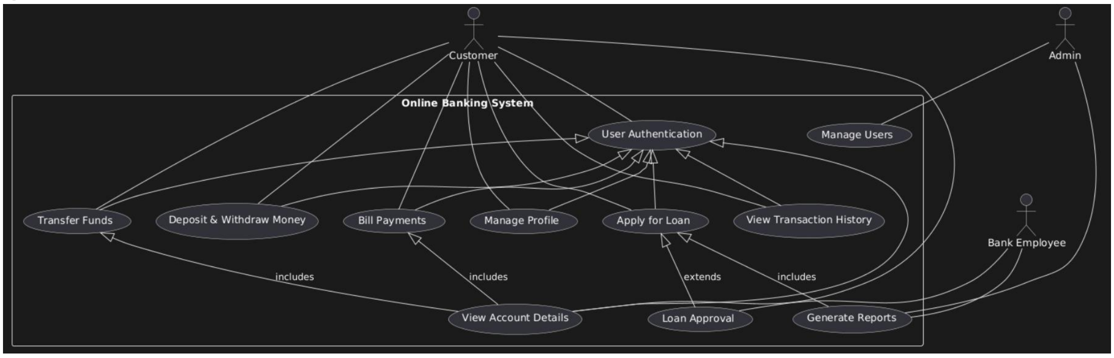
D.Jaswanth Reddy
BU22CSEN0100330

Q) UML DIAGRAMS OF ONLINE BANKING SERVICES

USE CASE DIAGRAM

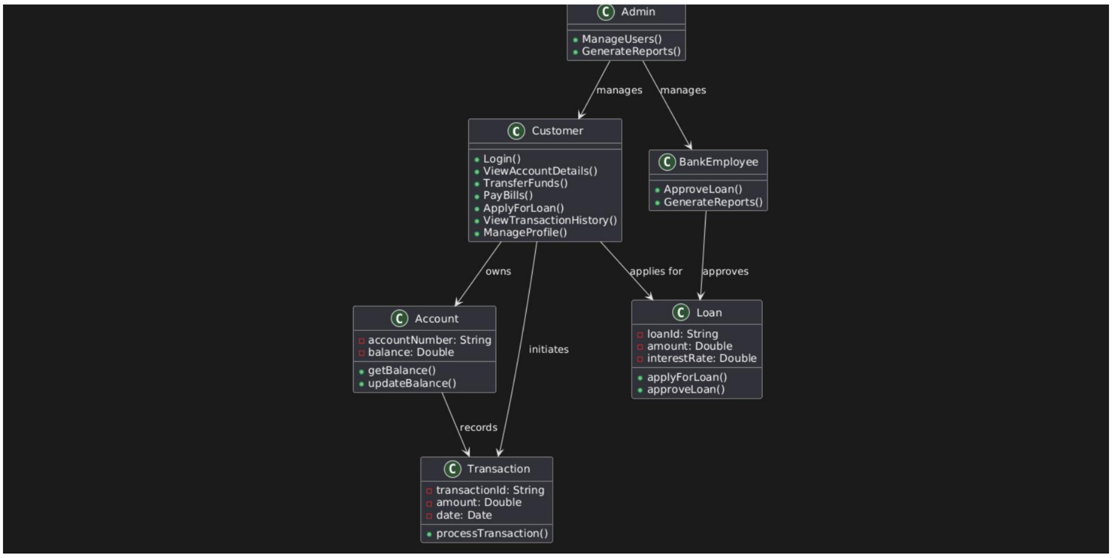
```
@startuml

actor Customer
actor "Bank Employee" as Employee
actor Admin

rectangle "Online Banking System" {
   (User Authentication) as Auth
   (View Account Details) as ViewAccount
   (Transfer Funds) as Transfer
   (Bill Payments) as BillPay
   (Apply for Loan) as Loan
   (Deposit & Withdraw Money) as CashTransactions
   (View Transaction History) as ViewHistory
   (Manage Profile) as ManageProfile
   (Manage Users) as ManageUsers
   (Generate Reports) as Reports
   (Loan Approval) as LoanApproval

   Auth <|-- ViewAccount
   Auth <|-- Transfer
   Auth <|-- BillPay
   Auth <|-- Loan
   Auth <|-- CashTransactions
   Auth <|-- ViewHistory
   Auth <|-- ManageProfile
   Loan <|-- LoanApproval : "extends"
   Transfer <|-- ViewAccount : "includes"
   BillPay <|-- ViewAccount : "includes"
   Loan <|-- Reports : "includes"
}

Customer -- Auth
Customer -- ViewAccount
Customer -- Transfer
Customer -- BillPay
Customer -- Loan
Customer -- CashTransactions
Customer -- ViewHistory
Customer -- ManageProfile

Employee -- LoanApproval
Employee -- Reports

Admin -- ManageUsers
Admin -- Reports
```

```
@enduml
```



CLASS DIAGRAM

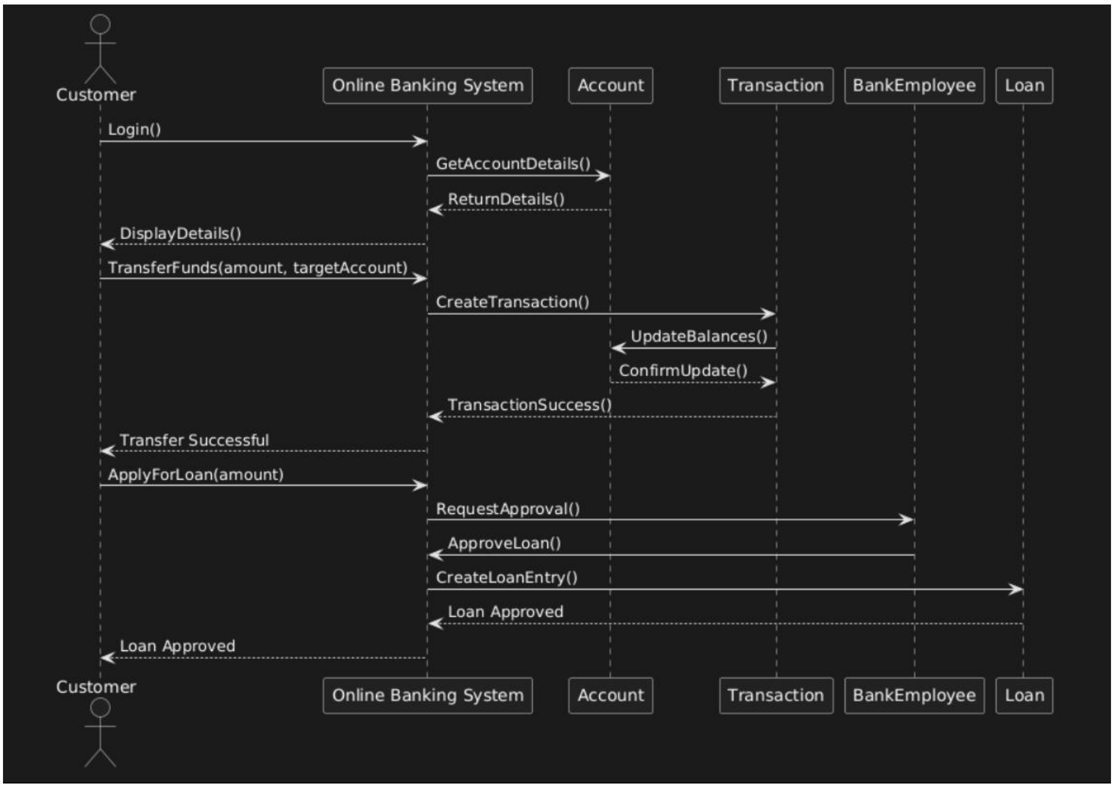
```
@startuml

class Customer {
   +Login()
   +ViewAccountDetails()
   +TransferFunds()
   +PayBills()
   +ApplyForLoan()
   +ViewTransactionHistory()
   +ManageProfile()
}

class BankEmployee {
   +ApproveLoan()
   +GenerateReports()
}

class Admin {
   +ManageUsers()
   +GenerateReports()
}

class Account {
   -accountNumber: String
   -balance: Double
   +getBalance()
   +updateBalance()
}

class Transaction {
   -transactionId: String
   -amount: Double
   -date: Date
   +processTransaction()
}

class Loan {
   -loanId: String
   -amount: Double
   -interestRate: Double
   +applyForLoan()
   +approveLoan()
}

Customer --> Account : owns
Customer --> Transaction : initiates
Customer --> Loan : applies for
BankEmployee --> Loan : approves
Admin --> Customer : manages
Admin --> BankEmployee : manages
Account --> Transaction : records

@enduml
```



SEQUENCE DIAGRAM

```
@startuml

actor Customer
participant "Online Banking System" as OBS
participant Account
participant Transaction
participant BankEmployee

Customer -> OBS: Login()
OBS -> Account: GetAccountDetails()
Account --> OBS: ReturnDetails()
OBS --> Customer: DisplayDetails()

Customer -> OBS: TransferFunds(amount, targetAccount)
OBS -> Transaction: CreateTransaction()
Transaction -> Account: UpdateBalances()
Account --> Transaction: ConfirmUpdate()
Transaction --> OBS: TransactionSuccess()
OBS --> Customer: Transfer Successful

Customer -> OBS: ApplyForLoan(amount)
OBS -> BankEmployee: RequestApproval()
BankEmployee -> OBS: ApproveLoan()
OBS -> Loan: CreateLoanEntry()
```

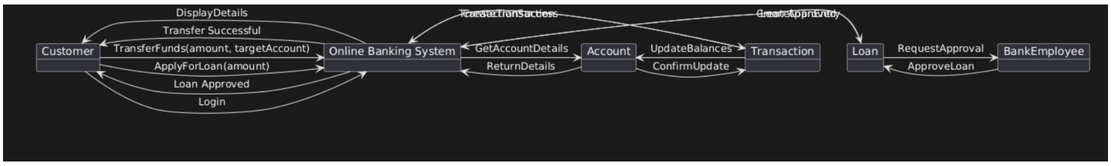
```
Loan --> OBS: Loan Approved
OBS --> Customer: Loan Approved

@enduml
```



COLLABORATION DIAGRAM

```
@startuml

object Customer
object "Online Banking System" as OBS
object Account
object Transaction
object BankEmployee
object Loan

Customer -> OBS: Login
OBS -> Account: GetAccountDetails
Account -> OBS: ReturnDetails
OBS -> Customer: DisplayDetails

Customer -> OBS: TransferFunds(amount, targetAccount)
OBS -> Transaction: CreateTransaction
Transaction -> Account: UpdateBalances
Account -> Transaction: ConfirmUpdate
Transaction -> OBS: TransactionSuccess
OBS -> Customer: Transfer Successful

Customer -> OBS: ApplyForLoan(amount)
OBS -> Loan: CreateLoanEntry
Loan -> BankEmployee: RequestApproval
```

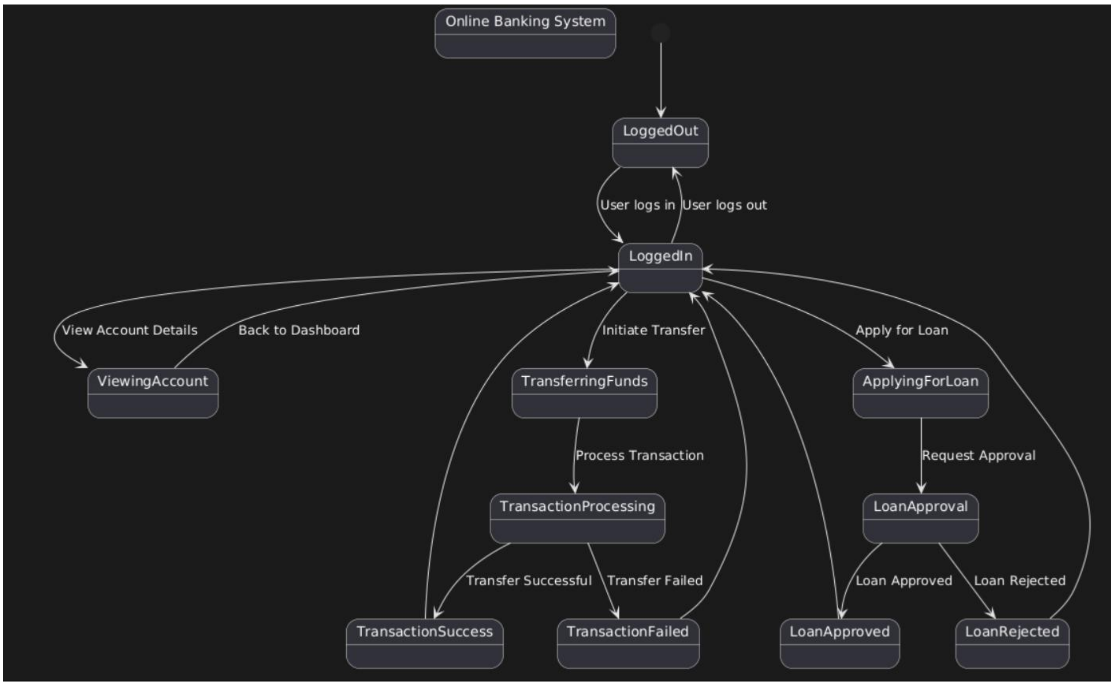
```
BankEmployee -> Loan: ApproveLoan
Loan -> OBS: Loan Approved
OBS -> Customer: Loan Approved

@enduml
```



STATE CHART DIAGRAM

```
@startuml

state "Online Banking System" as OBS

[*] --> LoggedOut

LoggedOut --> LoggedIn: User logs in
LoggedIn --> ViewingAccount: View Account Details
ViewingAccount --> LoggedIn: Back to Dashboard

LoggedIn --> TransferringFunds: Initiate Transfer
TransferringFunds --> TransactionProcessing: Process Transaction
TransactionProcessing --> TransactionSuccess: Transfer Successful
TransactionProcessing --> TransactionFailed: Transfer Failed
TransactionSuccess --> LoggedIn
TransactionFailed --> LoggedIn

LoggedIn --> ApplyingForLoan: Apply for Loan
ApplyingForLoan --> LoanApproval: Request Approval
LoanApproval --> LoanApproved: Loan Approved
LoanApproval --> LoanRejected: Loan Rejected
LoanApproved --> LoggedIn
LoanRejected --> LoggedIn

LoggedIn --> LoggedOut: User logs out
```

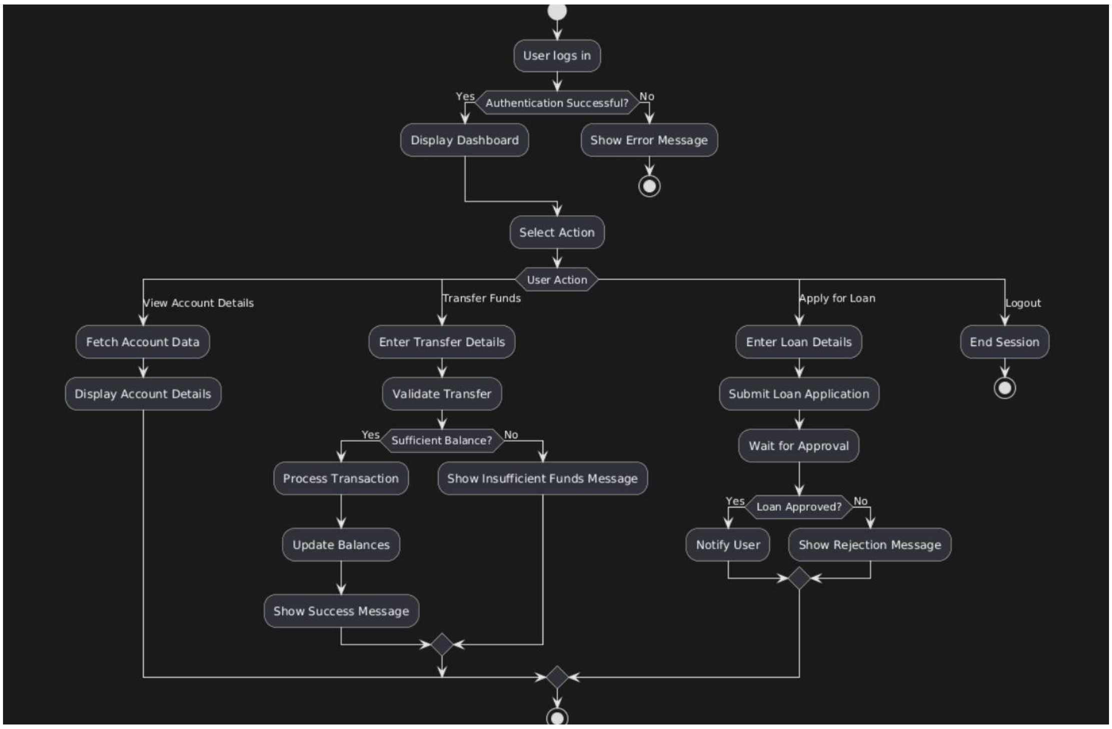
```
@enduml
```



ACTIVITY DIAGRAM

```
@startuml

start

:User logs in;
if (Authentication Successful?) then (Yes)
  :Display Dashboard;
else (No)
  :Show Error Message;
  stop
endif

:Select Action;
switch (User Action)
case (View Account Details)
  :Fetch Account Data;
  :Display Account Details;
case (Transfer Funds)
  :Enter Transfer Details;
  :Validate Transfer;
  if (Sufficient Balance?) then (Yes)
    :Process Transaction;
    :Update Balances;
    :Show Success Message;
  else (No)
    :Show Insufficient Funds Message;
  endif
case (Apply for Loan)
  :Enter Loan Details;
  :Submit Loan Application;
```

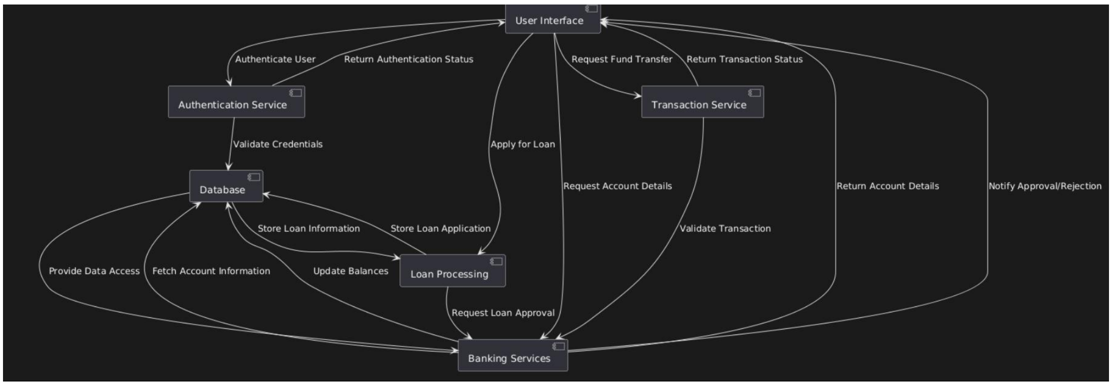
```
    :Wait for Approval;
    if (Loan Approved?) then (Yes)
        :Notify User;
    else (No)
        :Show Rejection Message;
    endif
case (Logout)
    :End Session;
    stop
endswitch

stop

@enduml
```



COMPONENT DIAGRAM

```
@startuml

component "User Interface" as UI
component "Authentication Service" as Auth
component "Banking Services" as Banking
component "Transaction Service" as Transaction
component "Loan Processing" as Loan
component "Database" as DB

UI --> Auth : Authenticate User
Auth --> DB : Validate Credentials
Auth --> UI : Return Authentication Status

UI --> Banking : Request Account Details
Banking --> DB : Fetch Account Information
Banking --> UI : Return Account Details
```

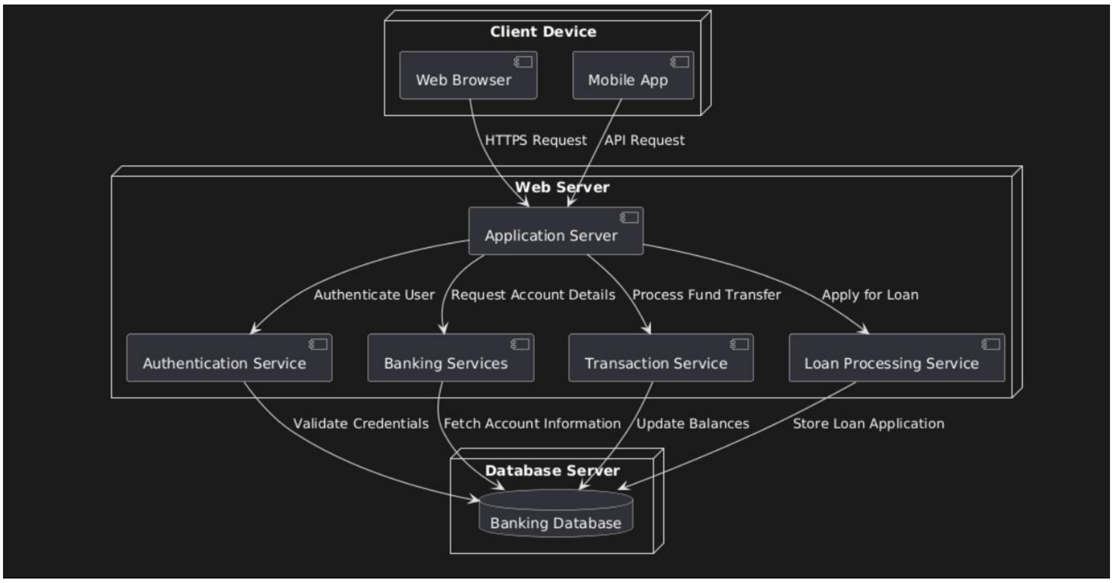
```
UI --> Transaction : Request Fund Transfer
Transaction --> Banking : Validate Transaction
Banking --> DB : Update Balances
Transaction --> UI : Return Transaction Status

UI --> Loan : Apply for Loan
Loan --> DB : Store Loan Application
Loan --> Banking : Request Loan Approval
Banking --> UI : Notify Approval/Rejection

DB --> Banking : Provide Data Access
DB --> Loan : Store Loan Information

@enduml
```



DEPLOYMENT DIAGRAM

```
@startuml

node "Client Device" {
  component "Web Browser" as Browser
  component "Mobile App" as Mobile
}

node "Web Server" {
  component "Application Server" as AppServer
  component "Authentication Service" as AuthService
  component "Banking Services" as BankingService
  component "Transaction Service" as TransactionService
  component "Loan Processing Service" as LoanService
}

node "Database Server" {
  database "Banking Database" as DB
}

Browser --> AppServer : HTTPS Request
Mobile --> AppServer : API Request

AppServer --> AuthService : Authenticate User
AuthService --> DB : Validate Credentials
```

```
AppServer --> BankingService : Request Account Details
BankingService --> DB : Fetch Account Information

AppServer --> TransactionService : Process Fund Transfer
TransactionService --> DB : Update Balances

AppServer --> LoanService : Apply for Loan
LoanService --> DB : Store Loan Application

@enduml
```


Client Device
Web Browser
Mobile App
HTTPS Request
API Request
Web Server
Application Server
Authenticate User
Request Account Details
Process Fund Transfer
Apply for Loan
Authentication Service
Banking Services
Transaction Service
Loan Processing Service
Validate Credentials
Fetch Account Information
Update Balances
Store Loan Application
Database Server
Banking Database