**1. Key Classes:**

Customer

Account

CheckingAccount

SavingAccount

Address

Bank

**2. Attributes/Fields and Methods for each class:**

**Customer:**

1. Attributes:

customerID: Unique identifier for the customer.

name: Name of the customer.

dateOfBirth: Date of birth of the customer.

ssn: Social security number.

address: Object of Address class.

accounts: List of Account objects (includes Checking and Saving accounts).

1. Methods:

openAccount(accountType, initialDeposit): Opens a new account for the customer.

closeAccount(accountID): Closes a specific account.

getAccounts(): Returns a list of all accounts linked to the customer.

**Account:**

1. Attributes:

accountID: Unique identifier for the account.

balance: Current balance of the account.

owners: List of Customers (max 2 for joint account).

1. Methods:

deposit(amount): Deposits money into the account.

withdraw(amount): Withdraws money from the account (will be overridden in CheckingAccount).

viewBalance(): Returns the current balance.

printStatement(): Prints the account statement.

**CheckingAccount (Inherits from Account):**

1. Attributes:

creditLimit: The max amount that can be borrowed.

1. Methods:

withdraw(amount): Withdraws money from the account, considering the credit limit.

setCreditLimit(amount): Sets/updates the credit limit.

**SavingAccount (Inherits from Account):**

1. Attributes:

Uses attributes from the parent class.

1. Methods:

Uses methods from the parent class.

**Address:**

1. Attributes:

street: Street address.

city: City.

state: State.

zipCode: Zip code.

1. Methods:

None

**Bank:**

1. Attributes:

customers: List of Customer objects.

accounts: List of Account objects.

1. Methods:

searchCustomer(customerID): Searches for a customer based on ID.

displayAllAccounts(customerID): Displays all accounts linked to a specific customer.

removeCustomer(customerID): Remove a specified customer.

**3. Relationship between classes:**

1. Customer to Account uses Association

One customer can have one or more accounts; an account can belong to one or more customers.

1. Customer to Address uses Composition

Address is a part of Customer

1. CheckingAccount and SavingAccount to Account uses Inheritance

CheckingAccount and SavingAccount are types of Account

1. Bank to Customer and Account uses Aggregation

Banks contain multiple customers and accounts.

**4. Inheritance Trees:**

Account is a parent class.

CheckingAccount and SavingAccount are subclasses inheriting from Account.