

**Adama Science and Technology University**

**project title :- Bank database management system**

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Description of entities and their respective attributes

1. Customer

. c\_id

. c\_name (composite)

- first\_name

- last\_name

. c\_phone

. c\_email

. Customer\_address (multivalued)

2. Customer\_address

. c\_id

. city

. street\_no

3. Branch

. branch\_id

. branch\_name

. Branch\_address (multivalued)

4. Branch\_address

. branch\_id

. city

. street\_no

5. Employee

. e\_id

. e\_name (composite)

- first\_name

- last\_name

. e\_phone

. e\_email

. branch\_id

. Employee\_address (multivalued)

6. Employee\_address

. e\_id

. city

. street\_no

7. Account

. account\_no

. account\_type

. account\_balance

8. Loan

. loan\_id

. loan\_type

. loan\_amount

9. Manager

. e\_id

. branch\_id

10. Credit\_Card

. credit\_card\_number

. credit\_card\_pin

. cc\_expiry\_date

. account\_no

11. Transaction

. transaction\_id

. transaction\_type

. amount

. account\_no

. transaction\_date

. c\_id

Description of the Bank System

The bank system has different components. These components are customers, employees, managers, loans, transactions, credit card, a branch and accounts.

Customers of the bank must provide first name, last name, email, phone number and address. First name, last name phone number and email can not be null. The address of a customer consists of a customer id, a city name and street number. The city can’t be null but the street number is optional. Also, customer email shall be unique for each customer. The bank will assign an id for each customer. This id is also unique.

One customer can have multiple accounts. The accounts have their own account number which is unique to a specific account. Each account has an account type and also an account balance attribute.

A bank branch has it's own name, address and a specific id. The address of a branch consists of a customer id, a city name and street number. The city can’t be null but the street number is optional. There are multiple employees that work in a branch. The branch name can’t be null. There is a manager for each branch. The manager is an employee in the bank too. A manager manages different employees and only one branch.

Employees of the bank must provide first name, last name, email, phone number and address. First name, last name phone number and email can not be null. The address of an employee consists of an employee id, a city name and street number. The city can’t be null but the street number is optional. The bank will assign an id for each employee. This id is unique for each employee. Many employees work in one branch. Also one employee can be a manager. An employee can also create multiple account for users. Many employees can also be managed by a single manager.

The accounts of customers consist of an account number, which is unique to each account, an account type, an account balance, an employee id and a customer id.

The credit cards on the other hand has their own specific credit card number which is unique for each credit card. It also has a pin number and an expiry date. Each credit card can represent only one account.

Another point to note is that a customer can perform a transaction. A transaction is characterized by a transaction id which is unique for each transaction. It also has a transaction date, a transaction type, an amount and an account number. A customer can perform many transactions.

Also, a customer can avail multiple loans. A loan has an id which is specific to each loan. It also has a type and an amount.

Relationship Among Entities

|  |  |  |  |
| --- | --- | --- | --- |
| Entity 1 | Entity 1 | Relationship type | Foreign Key |
| Customer | Account | 1:M | c\_id |
| Customer | Transaction | 1:M | c\_id |
| Customer | Loan | 1:M | c\_id |
| Credit Card | Account | 1:1 | account\_no |
| Employee | Account | 1:M | e\_id |
| Employee | Manager | M:1 | e\_id |
| Employee | Branch | M:1 | branch\_id |
| Manager | Employee | 1:1 | e\_id |
| Branch | Manager | 1:1 | branch\_id |

Relations between entities