
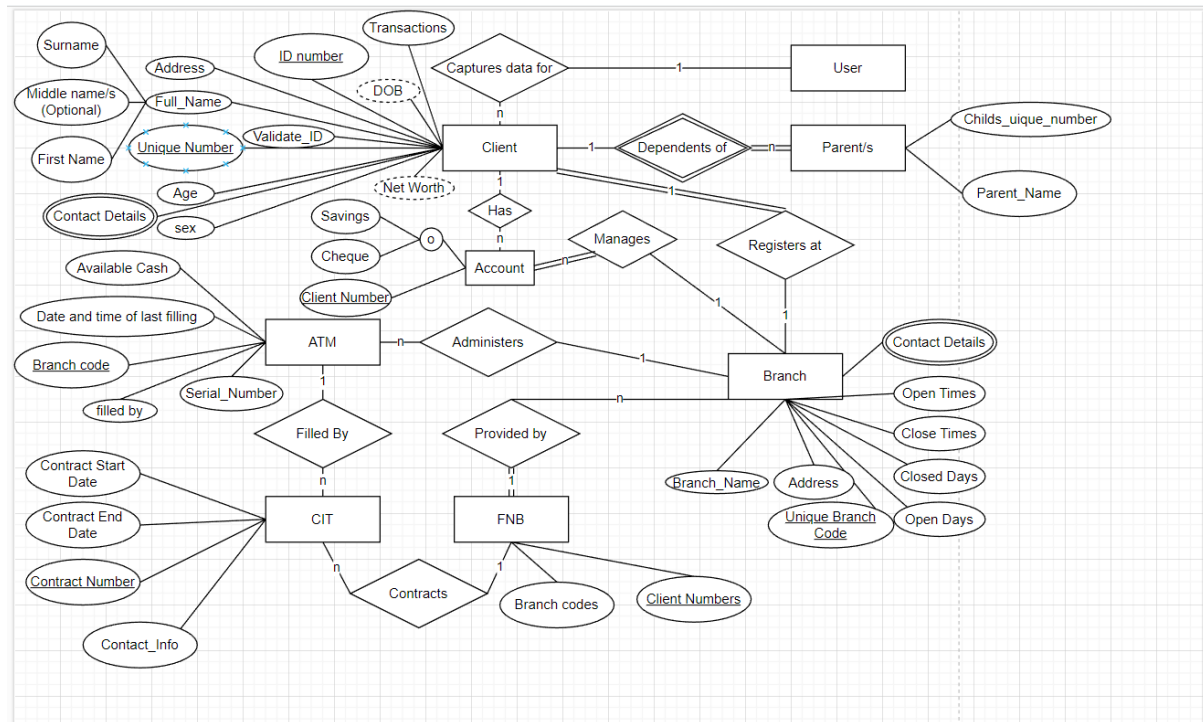


## Task 1

 **u21546216\_upbank** 112,0 KiB

## Task 2



## Task 3

### Step 1: Mapping of Regular Entity Types Creating relations for each strong entity type.

Client									
Unique Number	Full_Name	Address	age	sex	contact details	DOB	Net_Worth	Validate_ID	Transactions_per_Year

Branch							
Unique branch code	Address	Contact Details	Open times	close times	open days	close days	Branch_Name

Account	
Client Number	Account_Type

ATM				
Available cash	Date and time of last filling	branch code	Filled by	Serial_Number

CIT			
Contract Start Date	Contract End Date	Contract Number	Contact_Information

FNB	
Client Numbers	Branch Codes

### Step 2: Mapping of Weak Entity Types Adding in relations for each weak entity type.

Client									
Unique Number	Full_Name	Address	age	sex	contact details	DOB	Net_Worth	Validate_ID	Transactions_per_Year

Dependent		Branch							
EUN	Parent_Name	Unique branch code	Address	Contact Details	Open times	close times	open days	close days	Branch_Name

Account	
Client Number	Account_Type

ATM				
Available cash	Date and time of last filling	branch code	Filled by	Serial_Number

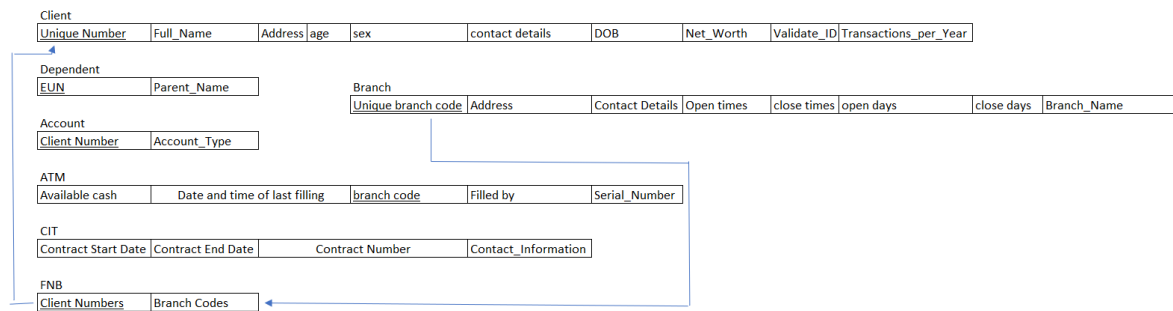
  

CIT			
Contract Start Date	Contract End Date	Contract Number	Contact_Information

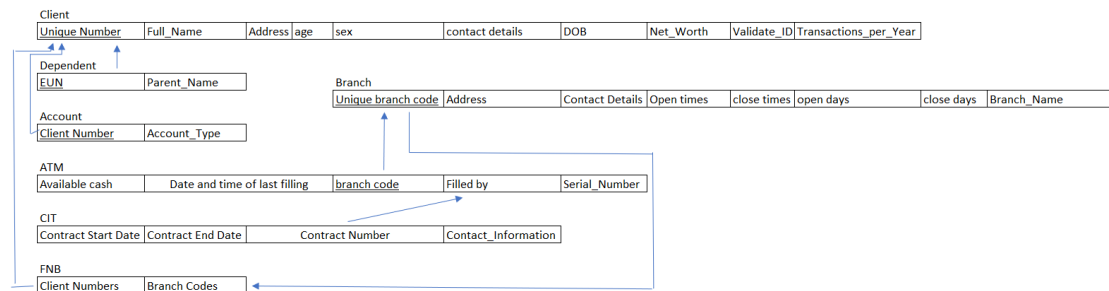
  

FNB	
Client Numbers	Branch Codes

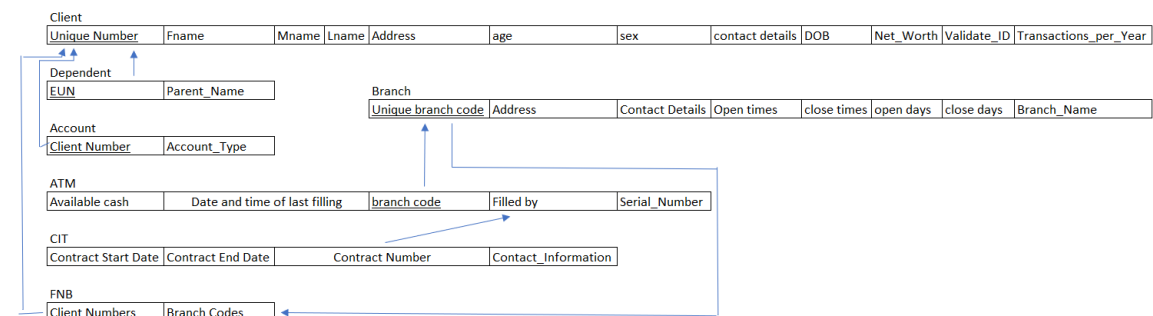
### Step 3: Mapping of Binary 1:1 Relationship Types Creating links between all the 1:1 relationships.



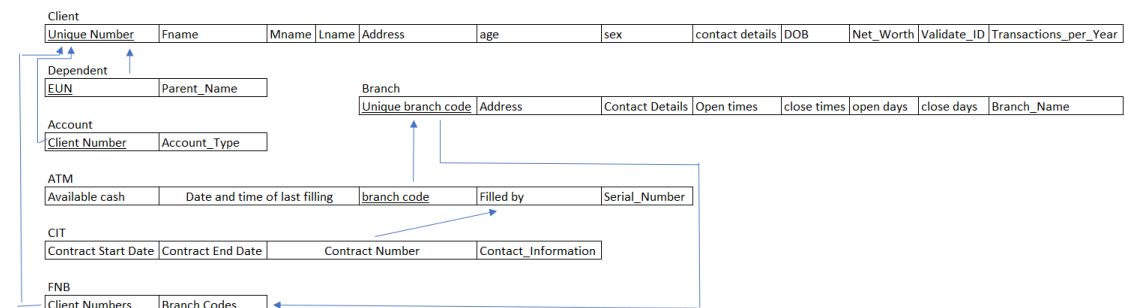
### Step 4: Mapping of Binary 1:N Relationship Types.



### Step 5: Mapping of Binary M:N Relationship Types. My modal has no M:N relations. Step 6: Mapping of Multivalued Attributes. Names is split up into Fname, Mname and Lname.



### Step 7



Task 4

Account:

Client_Unique_Number		Account_Type
12 345		Cheque
23 456		Savings
34 567		Savings
45 678		Cheque
54 321		Savings
67 890		Savings
98 765		Cheque

ATM:

Available_Cash	Date_And_Time_Of_Last_Filling	Branch_Code	Filled_By	Serial_Number
40 000	2023-03-21 16:10:00	6	678 901 234	ABC121936789
35 000	2023-03-18 09:00:00	7	789 012 345	ABC123443889
50 000	2023-04-03 08:35:00	2	123 456 789	ABC123456789
55 000	2023-03-24 13:30:00	5	567 890 123	ABC123458249
30 000	2023-03-30 15:45:00	3	345 678 901	ABC123493489
20 000	2023-04-01 12:00:00	2	234 567 890	ABC125756789
45 000	2023-03-27 10:20:00	4	456 789 012	ABC126543789

Branch:

Unique_Branch_Code	Address	Contact_Details	Open_Times	Close_Times	Open_Days	Close_Days	Branch_Name
1	1234 Maple St	branch1@FNB.com	9	5	Every day except public holidays	Christmas and new years	Randburg
2	456 Elm Ave	branch2@FNB.com	9	5	Every day except public holidays	Christmas and new years	Hatfield
3	789 Pine Rd	branch3@FNB.com	9	5	Every day except public holidays	Christmas and new years	Groenkloof
4	234 Oak St	branch4@FNB.com	9	5	Every day except public holidays	Christmas and new years	Fourways
5	567 Birch Ln	branch5@FNB.com	9	5	Every day except public holidays	Christmas and new years	Centurion
6	890 Maplewood Dr	branch6@FNB.com	9	5	Every day except public holidays	Christmas and new years	Midrand
7	123 Pinecrest Rd	branch7@FNB.com	9	5	Every day except public holidays	Christmas and new years	Sunninghill

CIT:

Contract_Start_Date	Contract_End_Date	Contract_number	Contact_Information
2022-01-01	2022-12-31	1 234	johndoe@email.com
2021-05-01	2022-04-30	2 345	janesmith@email.com
2023-06-01	2024-05-31	3 456	alexjohnson@email.com
2021-08-01	2022-07-31	4 567	samanthalee@email.com
2022-09-01	2023-08-31	5 678	chrisbrown@email.com
2022-02-01	2023-01-31	6 789	davidwilson@email.com
2023-03-01	2024-02-29	7 890	sarahkim@email.com

Clients:

ID_Number	DOB	Full_Name	Address	Unique_Number	Age	Sex	Net_Worth	Contact_Details	Validate_ID	Transactions_per_year	
202 020 000 124	2002-02-02	William Lee	789 Oak Ave	98 765	19	Male	8 000	william.lee@yahoo.com	0	...	0
312 010 000 123	2003-12-01	Emily Johnson	456 Elm St	54 321	18	Female	5 000	emily.johnson@gmail.com	0	...	9
412 040 000 126	2004-12-04	Jacob Patel	567 Pine Blvd	67 890	17	Male	2 000	jacob.patel@gmail.com	0	...	42
503 030 000 125	2005-03-03	Sophie Brown	123 Maple Rd	12 345	16	Female	1 000	sophie.brown@hotmail.com	1	...	10
707 050 000 127	2007-07-05	Emma Kim	789 Cedar Dr	23 456	14	Female	1 500	emma.kim@hotmail.com	1	...	10
808 070 000 129	2008-08-07	Ava Hernandez	234 Birch Ave	45 678	13	Female	700	ava.hernandez@gmail.com	0	...	76
906 060 000 128	2009-06-06	Michael Nguyen	901 Oak St	34 567	12	Male	500	michael.nguyen@yahoo.com	1	...	35

FNB:

Client_Number	Branch_Codes
12 345	2
23 456	3
34 567	5
45 678	2
54 321	4
67 890	7
98 765	2

Parents:

Childs_Unique_Number	Parent_Name
12 345	Karen Brown
23 456	Jin Kim
34 567	Linh Nguyen
45 678	Sofia Hernandez
54 321	Mary Johnson
67 890	Raj Patel
98 765	David Lee

Task 5

5.1: `SELECT Full_Name, DOB, Address, Sex`  
`FROM clients`

5.2: `DROP EXTENSION Unique_Branch_Code`  
`WHERE Unique_Branch_Code = 1;`

5.3: `SELECT *`  
`FROM clients`  
`WHERE Validate_ID = 0`

5.4: `UPDATE ATM`  
`SET Branch_Code = 2`  
`WHERE Branch_Code = 1;`

Task 6

6.1:  $\sigma(\text{Serial\_Number like 'ABC123\%'})(\text{atm})$

6.2: Concat  $\leftarrow$  CIT U ATM

From that

$\pi(\text{Contact\_Info})(\text{Branch\_Code} = 3)(\text{Concat})$

6.3:

$\pi(\text{Full\_Name, Contact\_Details})(\text{Transactions\_per\_year} > 24)(\text{Clients})$

Task 7

Please refer to the file for SQL dump.