

Practical assignment 1

UPBank Database



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# Task 1

* CLIENTS
* BRANCH
* ATM
* CHEQUE
* SAVINGS
* 32\_DAY\_DEPOSIT
* CONTRACTS

# Task 2

* CLIENTS(u\_number, id\_number, age, sex, date\_of\_birth, name(first, middle, last), address(postal(street\_address(number, street), locality, postcode), physical(street\_address(number, street), locality, postcode)), contact(sms(code, number), telephone(code, number), email), membership(id\_proof, physical\_proof))
* BRANCH(branch\_code, address(street\_address(number, street), locality, postcode), operating\_hours(open, close), contact(code, number))
* ATM(branch\_code, atm\_number, cash, last\_fill(date, time, company\_code))
* CONTRACTS(company\_code, start, end)
* CHEQUE(account\_number, branch\_code, u\_number, balance(amount, currency), interest\_rate)
* SAVINGS(account\_number, branch\_code, u\_number, balance(amount, currency), interest\_rate)
* 32\_DAY\_DEPOSIT(account\_number, branch\_code, u\_number, balance(amount, currency), interest\_rate, notification\_date)

# Task 3

* CLIENTS:name -> is complex as a name can be split up into first name, middle name(s) and last name.
* CLIENTS:address -> is complex as address can be split into a postal as well as a physical address.
* CLIENTS:address:postal -> is complex as postal can be split into a street address, the locality of the address and the postal code of the area.
* CLIENTS:address:postal:street\_address -> is complex as the street address has a street number as well as the street proper.
* CLIENTS:address:physical -> is complex as physical can be split into a street address, the locality of the address and the postal code of the area.
* CLIENTS:address:physical:street\_address -> is complex as the street address has a street number as well as the street proper.
* CLIENTS:contact -> is complex due to there being multiple ways to contact including sms, a telephone and email.
* CLIENTS:phone:sms -> is complex as the number is made up of an area code and the number itself.
* CLIENTS:phone:telephone -> -> is complex as the number is made up of an area code and the number itself.
* CLIENTS:membership -> is complex as the membership needs proof of the id\_number as well as proof of the physical address.
* BRANCH:address -> is complex as postal can be split into a street address, the locality of the address and the postal code of the area.
* BRANCH:address:street\_address -> is complex as the street address has a street number as well as the street proper.
* ATM:last\_fill -> is complex as the last fill needs to have a date and a time.

# Task 4

* CLIENTS:age -> this is derived from CLIENTS:id\_number.
* CLIENTS:date\_of\_birth -> this is derived from CLIENTS:id\_number.
* CLIENTS:sex -> this is derived from CLIENTS:id\_number.

# Task 5

* 32\_DAY\_DEPOSIT:notification\_date -> this could possibly be NULL due to the client having never attempted to access the funds of the account.

# Task 6

1. No, the model will not allow for this additional account. The solution to this problem would be to add an additional attribute to 32\_DAY\_DEPOSIT named ‘sharia’.
2. Yes, the model does allow for the introduction of a USD$ account due to the balance being a composite attribute with an amount and a currency.
3. No, the model will not allow or additional contact methods. The solution to this issue would be to add a multivalued attribute named ‘voip’ to the composite attribute of CLIENTS:contact.
4. No, the model does not cater for additional verification methods. The solution to this issue would be to make the CLIENTS:membership composite attribute into a multivalued attribute and changing the current attributes to ‘type’ and ‘proof’.

# Task 7

Diagram

Description automatically generated

I could not get the weak key to work properly in the drawing software thus I will state it here. Weak Key :- ATM:atm\_number