# Module Exercise 7.5: CS 5012: RA Banking

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| --- | --- |
| Banking DB Schema   * branch (branch-name, branch-city, assets) * customer (customer-name, customer-street, customer-city) * account (account-number, branch-name (FK), balance) * loan (loan-number, branch-name (FK), amount) * depositor (customer-name, account-number (FK)) * borrower (customer-name, loan-number (FK)) |  |

## **Questions**

1. Find all loans over $1200.
   1. Results in:

|  |  |  |
| --- | --- | --- |
| loan-number | branch-name | amount |
| L-14 | Downtown | 1500 |
| L-15 | Perryridge | 1500 |
| L-16 | Perryridge | 1300 |
| L-23 | Redwood | 2000 |

1. Find the loan number for each loan of an amount greater than $1200.
   1. Results in:

|  |
| --- |
| loan-number |
| L-14 |
| L-15 |
| L-16 |
| L-23 |

1. Find the names of all customers who have a loan, an account, or both from the bank.
   1. Results in:

|  |
| --- |
| customer-name |
| Hayes |
| Johnson |
| Jones |
| Lindsay |
| Smith |
| Turner |
| Adams |
| Curry |
| Jackson |
| Williams |

* enforces equality on shared attributes (customer-name)
* pads with nulls any accounts-number or loan-number that isn’t available for the join on customer-name
* removes duplicates

1. Find the names of all customers who have a loan and an account at the bank.
   1. Results in:

|  |
| --- |
| customer-name |
| Hayes |
| Jones |
| Smith |

* 1. enforces equality on shared attributes (customer-name)

1. Find the names of all customers who have a loan at the Perryridge branch.
   1. )
   2. Results in:

|  |
| --- |
| customer-name |
| Hayes |
| Adams |

* 1. enforces equality on shared attributes (loan-number)

1. Find the names of all customers who have a loan at the Perryridge branch, but no account at any branch of the bank.
   1. Results in:

|  |
| --- |
| customer-name |
| Adams |

* 1. finds tuples in the first projection but not the second.

1. Find the names of all customers who have an account at the Downtown and Mianus branches.
   1. Results in an empty tuple.
2. Find the total amount each branch has in accounts.
   1. The above assumes that total amount the branch has in its accounts is the amount in the assets column of the relation.
3. Find the average loan amount of each customer.
   1. customer-name
   2. Left join the Borrower relation on the projection of loan-number and amount from the Loan relation. From that join, project customer-name and amount. Then, by customer-name, aggregate the average loan amount.
4. Find the names of all customers who have an account at every branch located in Brooklyn.
   1. Use the division operator to only return records that match both the branch-names in branches from Brooklyn.