CS 5012: RA Banking – Module Exercise

You are given the following schema and tables from a Banking Database. Respond to each of the following ten questions, by including the RA query that returns the requested data from the DB.

Note: Feel free to use the rename operation (ρ) to rename the resulting relations, so they can be used/referenced in other operations within the same question.

Banking DB Schema

branch (branch-name, branch-city, assets)
customer (customer-name, customer-street, customer-city)
account (account-number, branch-name, balance)
loan (loan-number, branch-name, amount)
depositor (customer-name, account-number)
borrower (customer-name, loan-number)

Banking DB Tables

Branch Table

branch-name	branch-city	assets
Brighton	Brooklyn	7100000
Downtown	Brooklyn	9000000
Mianus	Horseneck	400000
North Town	Rye	3700000
Perryridge	Horseneck	1700000
Pownal	Bennington	300000
Redwood	Palo Alto	2100000
Round Hill	Horseneck	8000000

Customer Table

customer-name	customer-street	customer-city
Adams	Spring	Pittsfield
Brooks	Senator	Brooklyn
Curry	North	Rye
Glenn	Sand Hill	Woodside
Green	Walnut	Stamford
Hayes	Main	Harrison
Johnson	Alma	Palo Alto
Jones	Main	Harrison
Lindsay	Park	Pittsfield
Smith	North	Rye
Turner	Putnam	Stamford
Williams	Nassau	Princeton

Account Table

account-number	branch-name	balance
A-101	Downtown	500
A-215	Mianus	700
A-102	Perryridge	400
A-305	Round Hill	350
A-201	Brighton	900
A-222	Redwood	700
A-217	Brighton	750

Loan Table

loan-number	branch-name	amount
L-11	Round Hill	900
L-14	Downtown	1500
L-15	Perryridge	1500
L-16	Perryridge	1300
L-17	Downtown	1000
L-23	Redwood	2000
L-93	Mianus	500

Depositor Table

customer-name	account-number
Hayes	A-102
Johnson	A-101
Johnson	A-201
Jones	A-217
Lindsay	A-222
Smith	A-215
Turner	A-305

Borrower Table

customer-name	loan-number
Adams	L-16
Curry	L-93
Hayes	L-15
Jackson	L-14
Jones	L-17
Smith	L-11
Smith	L-23
Williams	L-17

Questions for the Bank Database

1. Find all loans over $1200.

2. Find the loan number for each loan of an amount greater than $1200.

3. Find the names of all customers who have a loan, an account, or both from the bank.

4. Find the names of all customers who have a loan and an account at the bank.

5. Find the names of all customers who have a loan at the Perryridge branch.

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

7. Find the names of all customers who have an account at the Downtown and Mianus branches.

8. Find the total amount each branch has in accounts.

9. Find the average loan amount of each customer.

10. Find the names of all customers who have an account at every branch located in Brooklyn.