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Relational Algebra Expressions

① $\pi_{\text{branch_name}, \text{branch_city}} (\sigma_{\text{assets} > 1000000} (\text{Branch}))$

②

$\pi_{\text{account_number}, \text{balance}} (\sigma_{\text{branch_name} = \text{'Downtown'} \text{ OR } \text{balance BETWEEN 600 AND 750}} (\text{Account}))$

③

$\pi_{\text{account_number}} (\sigma_{\text{branch_city} = \text{'Rye'}} (\text{Branch} \bowtie \text{Account}))$

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④

π loan-number ($\sigma_{\text{Loan.loan-number} = \text{Borrower.loan-number}}$

AND $\text{Borrower.customer-name} = \text{Customer.}$

$\text{customer-name AND amount} \geq 1000$ AND

$\text{customer-city} = \text{'Harrison'}$ (Loan x
Borrower x
Customer))

⑤

τ balance \downarrow (account)

⑥ τ customer-city (customer)

⑦

π customer-name ($\sigma_{\text{customer.customer-name} =$

$\text{Depositor.customer-name AND}$

$\text{Depositor.account-number} = \text{Account.}$

account-number (Customer x Depositor x Account))

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π customer_name (σ customer.customer_name = Borrower.
customer_name AND Borrower.loan_number
= Loan.loan_number (σ customer \times Borrower
 \times Loan))

8

π customer_name, customer_street, customer_city
(σ customer.customer_name = Depositor.customer_name
AND Depositor.account_number = ~~Account~~
Account.account_number (customer \times Depositor \times
Account))

9

π customer_name, customer_street, customer_city
(σ customer.customer_name = ^{Borrower.}~~Depositor.~~customer_name
AND Borrower.loan_number = Loan.
loan_number (customer \times Borrower \times Loan))

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⑨ π customer_name, customer_city (6 customer.
customer_name = Borrower.customer_name
AND Borrower.loan_number =
Loan.loan_number (customer x
Borrower x Loan))

π customer_name, customer_city (6 customer.
customer_name = Depositor.customer_name
AND Depositor.account_name =
Account.account_name (6 customer x
Depositor x
Account))

⑩ \sum assets (Branch)

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⑪ branch-name Gavg(balance) (Account)

⑫ branch-city Gavg(balance) (Account & Branch)

⑬ branch-name Gmin(amount) (Loan)

⑭ branch-name Gcount(loan-number) (Loan)

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Π customer-name, account-number (Depositor)

Π customer-name, account-number (\in Depositor.
account-number, Account.account-
number AND Account.balance \times
temp.balance (Depositor \times Account \times
Ptemp (@Account))