

1. Find all loans over \$1200

$$\sigma_{amount > 1200}(loan)$$

2. Find the loan number for each loan of an amount greater than \$1200. Do not repeat the names of the same sailors

$$\pi_{loan_number}(\sigma_{amount > 1200}(loan))$$

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

$$\pi_{customer_name}(depositor) \cup \pi_{customer_name}(borrower)$$

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

$$\pi_{customer_name}(depositor) \cap \pi_{customer_name}(borrower)$$

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

$$\pi_{customer_name}(borrower \bowtie (\sigma_{branch_name = "Perryridge"}(loan)))$$

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

$$\pi_{customer_name} \left(borrow \bowtie (\sigma_{branch_name = Perryridge}(loan)) \right) - \pi_{customer_name}(depositor \bowtie account)$$

7. Find the names of all customers who have a account at both the Downtown and Mianus branch

$$(\pi_{customer_name}(\sigma_{branch_name="Downtown"}((\pi_{customer_name, branch_name}(borrower \bowtie loan)) \cup (\pi_{customer_name, branch_name}(depositor \bowtie account))))))$$

$$\cup$$

$$(\pi_{customer_name}(\sigma_{branch_name="Mianus"}((\pi_{customer_name, branch_name}(borrower \bowtie loan)) \cup (\pi_{customer_name, branch_name}(depositor \bowtie account))))))$$

8. Find the total amount each branch has in accounts

$$branch_name G_{sum(balance)}(account)$$

9. Find the average loan amount of each customer

$$customer_name G_{avg(amount)}(borrower \bowtie loan)$$

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

$$\pi_{customer_name}(\sigma_{branch_city="Brooklyn"}((depositor \bowtie account) \bowtie (branch)))$$

