

2.7

1. $\Pi_{branch_name}(\sigma_{branch_city="Chicago"}(branch))$
2. $\Pi_{ID}(\sigma_{branch_name="Downtown"}(borrower \bowtie_{borrower.loan_number=loan.loan_number} loan))$

2.12

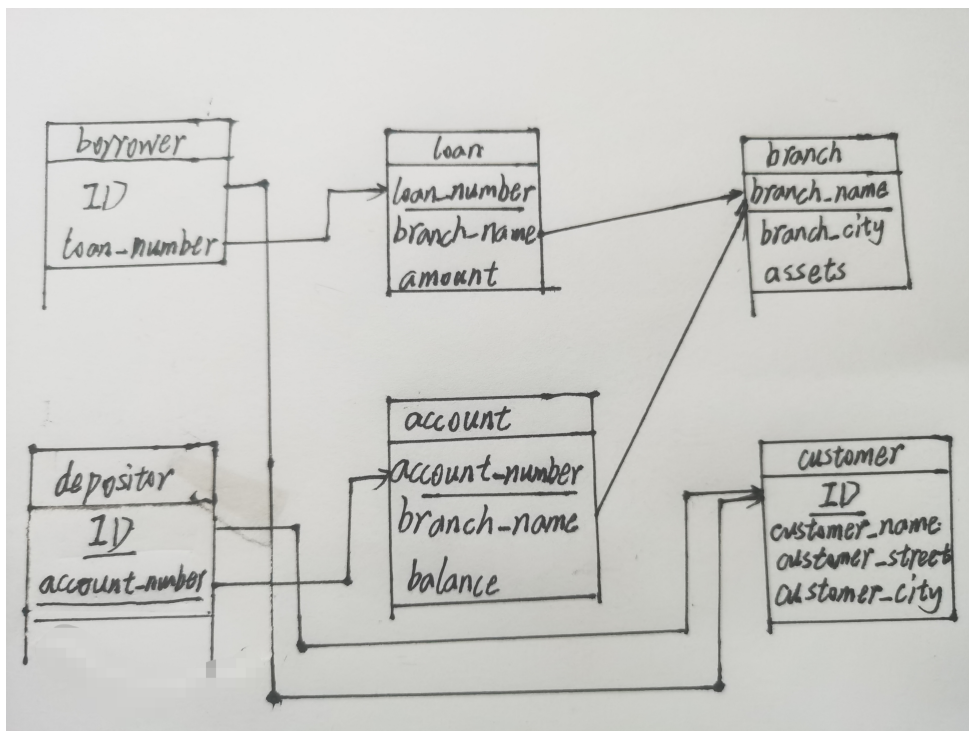
a. 主键即选定的唯一标识，部分关系存在多个主键可选择。

1. branch:branch_name;
2. customer:ID or customer_name;
3. loan:loan_number;
4. borrower:ID and loan_name;
5. account:account_number;
6. depositor:ID and account_number.

b. branch 与 customer 关系没有外键

1. loan: branch_name referencing branch
2. borrower: customer_name referencing customer ; loan_number referencing loan
3. account: branch_name referencing branch
4. depositor: customer_name referencing customer ; account_number referencing account

2.13



2.15

- $\Pi_{\text{loan_number}}(\sigma_{\text{amount} > 10000}(\text{loan}))$
- $\Pi_{ID}(\sigma_{\text{balance} > 6000}(\text{depositor} \bowtie_{\text{depositor.account_number} = \text{account.account_number}} \text{account}))$
- $\Pi_{ID}(\sigma_{\text{balance} > 6000 \wedge \text{branch_name} = \text{"Uptown"}}(\text{depositor} \bowtie_{\text{depositor.account_number} = \text{account.account_number}} \text{account}))$