# ER – Relational Mapping

Use the ER-to-Relational mapping algorithm to map the following ER-diagram into a relational database design.

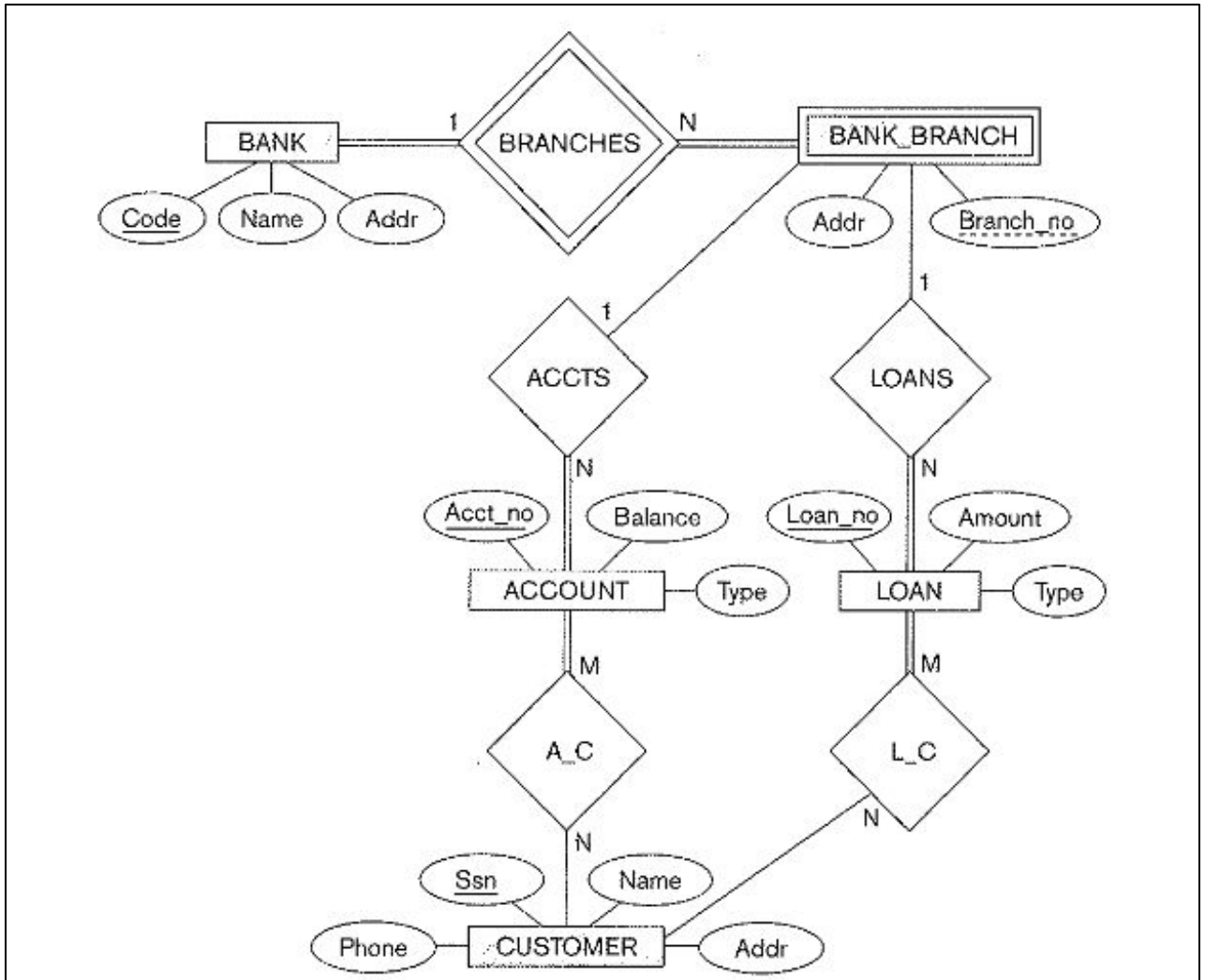



Figure 1: A Bank database schema[1]

## 1. Mapping of Regular Entity Types

- BANK(Code, BName, BAddr)
- ACCOUNT(Acct no, Balance, Type)
- LOAN(Loan no, Amount, LType)
- CUSTOMER(Ssn, Phone, CName, CAddr)

## 2. Mapping of Weak Entity Types

- BANK(Code, BName, BAddr)
- ACCOUNT(Acct no, Balance, Type)
- LOAN(Loan no, Amount, LType)
- CUSTOMER(Ssn, Phone, CName, CAddr)
- BANK BRANCH(BankCode, Branch no, BranchAddr)

## 3. Mapping of Binary 1:1 Relation Types

- No 1:1 relations

## 4. Mapping of Binary 1:N Relationship Types

- BANK(Code, BName, BAddr)
- ACCOUNT(Acct no, Balance, Type, BankCode, BankBranchNo)
- LOAN(Loan no, Amount, LType, BankCode, BankBranchNo)
- CUSTOMER(Ssn, Phone, CName, CAddr)
- BANK BRANCH(BankCode, Branch no, BranchAddr)

**5. Mapping of Binary M:N Relationship Types**

- BANK(Code, BName, BAddr)
- ACCOUNT(Acct no, Balance, Type, BankCode, BankBranchNo)
- LOAN(Loan no, Amount, LType, BankCode, BankBranchNo)
- CUSTOMER(Ssn, Phone, CName, CAddr)
- BANK BRANCH(BankCode, Branch no, BranchAddr)
- A_C(AccountNumber, Ssn)
- L _C(LoanNumber, Ssn)

**6. Mapping of Multivalued attributes**

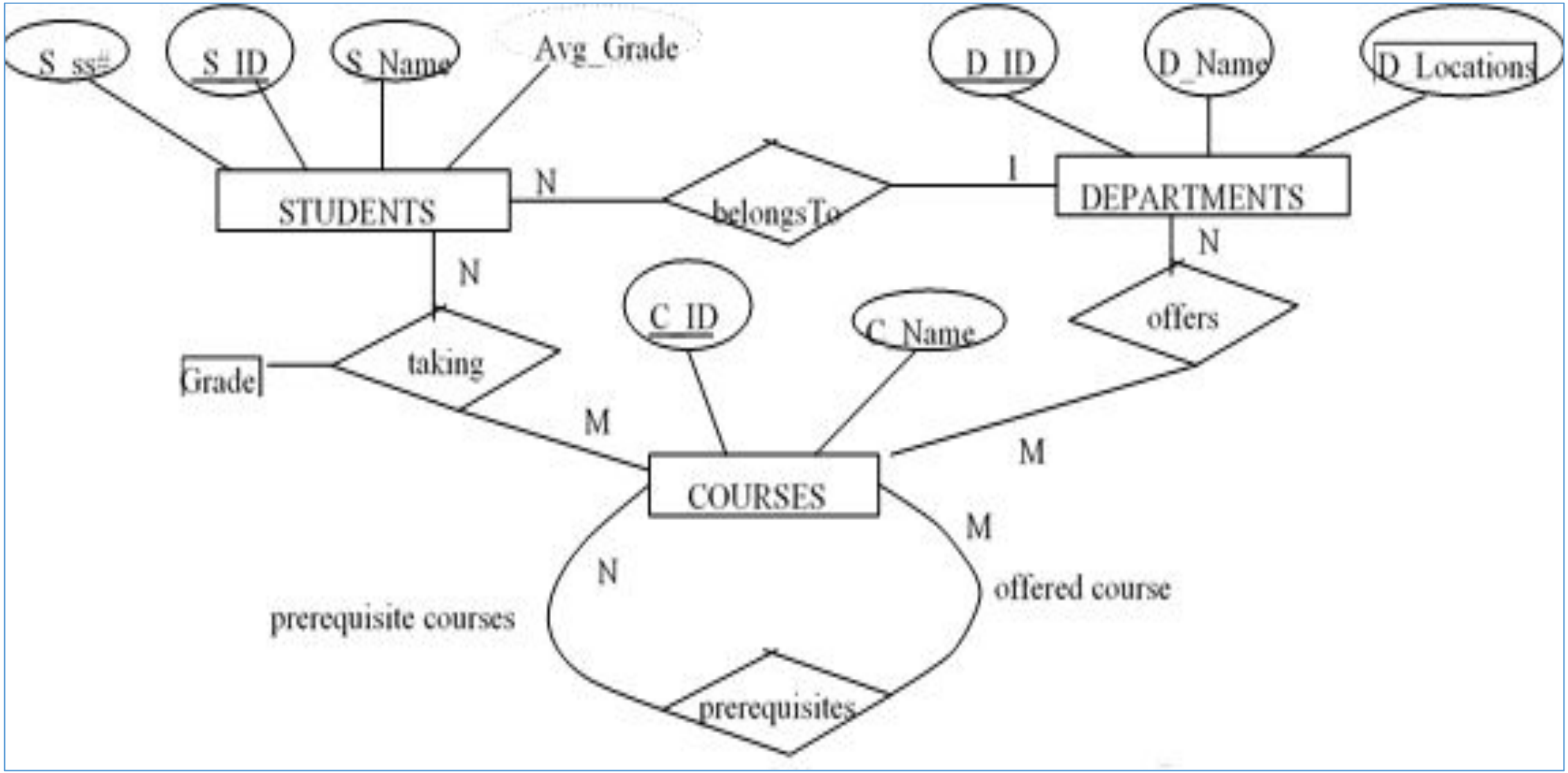
- No multivalued attributes

## 7. Mapping of N-ary Relationship Types

- No n-ary relations

**Final solution:**

- **BANK(Code, BName, BAddr)**
- **ACCOUNT(Acct no, Balance, Type, BankCode, BankBranchNo)**
- **LOAN(Loan no, Amount, LType, BankCode, BankBranchNo)**
- **CUSTOMER(Ssn, Phone, CName, CAddr)**
- **BANK BRANCH(BankCode, Branch no, BranchAddr)**
- **A_C(AccountNumber, Ssn)**
- **L_C(LoanNumber, Ssn)**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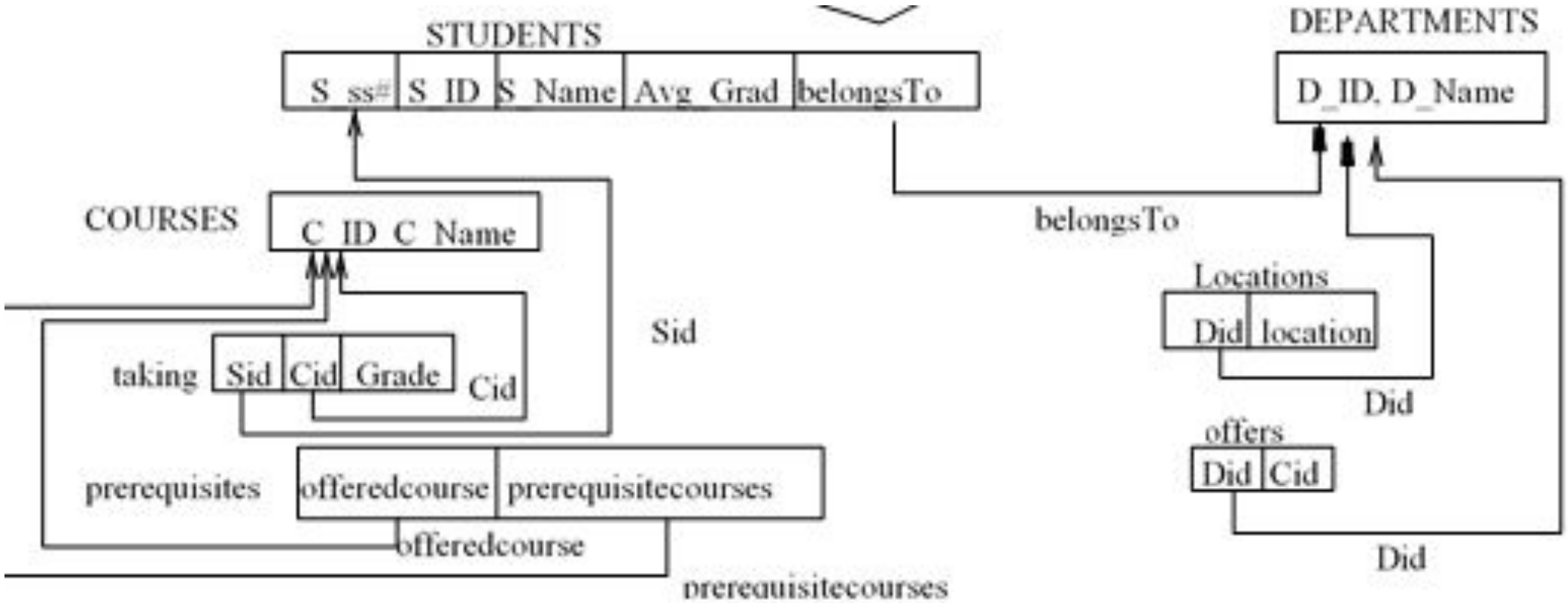
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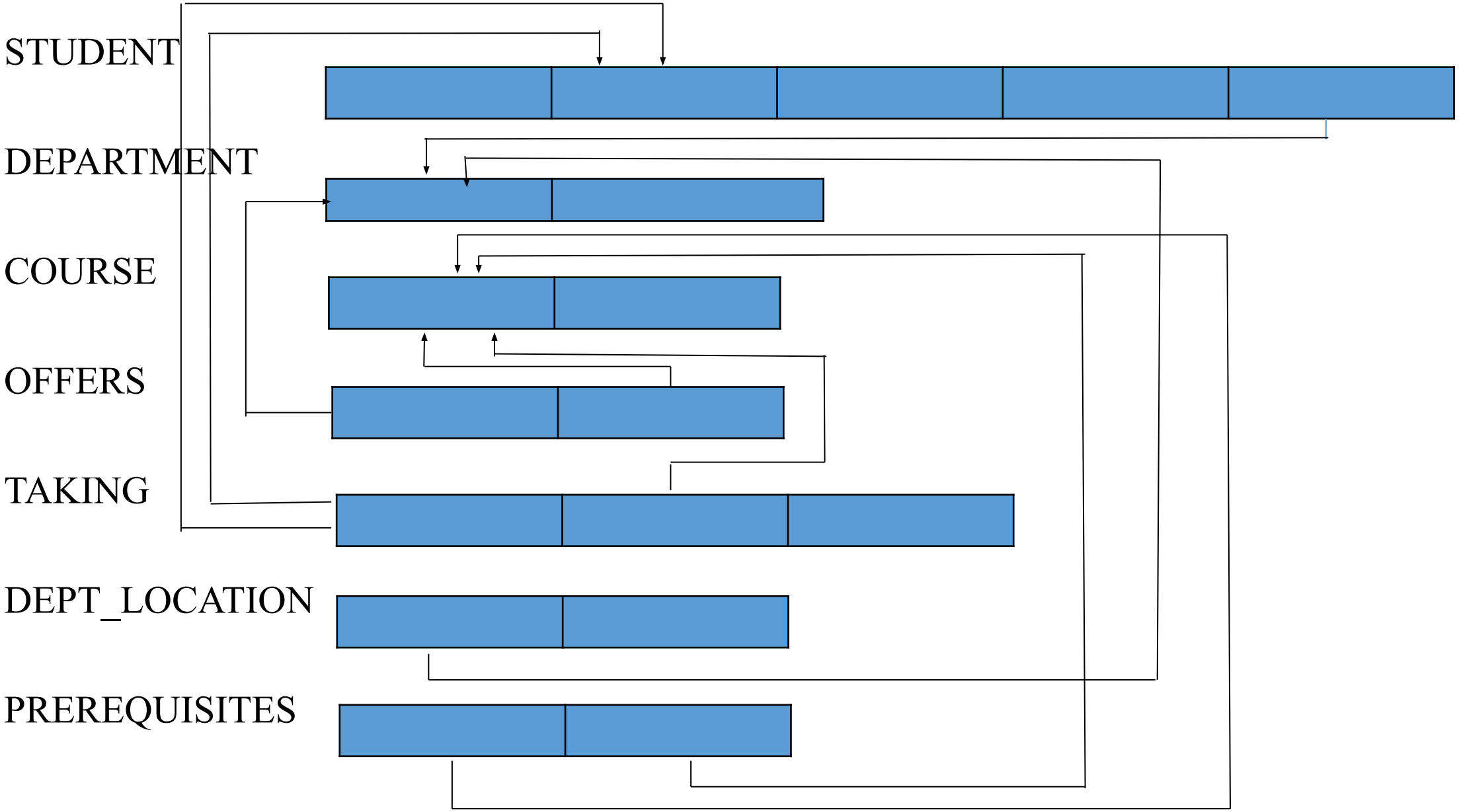
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