1. Translating BRANCHES

There are three different ways to translate the relationship: Branches

1st: Adding Branch\_no into Bank

BANK

|  |  |  |  |
| --- | --- | --- | --- |
| Code | Name | Addr | Branch-no |

BANK\_BRANCH

|  |  |
| --- | --- |
| Addr | Branch-no |

2nd: Adding bank Code into BANK\_BRANCH

BANK

|  |  |  |
| --- | --- | --- |
| Code | Name | Addr |

BANK\_BRANCH

|  |  |  |
| --- | --- | --- |
| Addr | Branch-no | Bank\_code |

3rd: Building a new table BRANCHES which has two attributes: bank\_code and branch\_no

BANK

|  |  |  |
| --- | --- | --- |
| Code | Name | Addr |

BANK\_BRANCH

|  |  |
| --- | --- |
| Addr | Branch-no |

BRANCHES

|  |  |
| --- | --- |
| Bank\_code | Branch-no |

1. Translating ACCTS

There are three different ways to translate the relationship: ACCTS

1st: Adding ACCT\_no into BANK\_BRANCH

BANK\_BRANCH

|  |  |  |
| --- | --- | --- |
| Addr | Branch-no | ACCT\_no |

ACCOUNT

|  |  |  |
| --- | --- | --- |
| ACCT\_no | Balance | Type |

2nd: Adding branch\_no into ACCOUNT

BANK\_BRANCH

|  |  |
| --- | --- |
| Addr | Branch-no |

ACCOUNT

|  |  |  |  |
| --- | --- | --- | --- |
| ACCT\_no | Balance | Type | Branch-no |

3rd: Building a new table ACCTS which has two attributes: ACCT\_no and branch\_no

BANK\_BRANCH

|  |  |
| --- | --- |
| Addr | Branch-no |

ACCOUNT

|  |  |  |
| --- | --- | --- |
| ACCT\_no | Balance | Type |

ACCTS

|  |  |
| --- | --- |
| Branch-no | ACCT\_no |

1. Translating LOANS

There are three different ways to translate the relationship: LOANS

1st: Adding loan\_no into BANK\_BRANCH

BANK\_BRANCH

|  |  |  |
| --- | --- | --- |
| Addr | Branch-no | Loan\_no |

LOAN

|  |  |  |
| --- | --- | --- |
| Loan\_no | Amount | Type |

2nd: Adding branch\_no into LOAN

BANK\_BRANCH

|  |  |
| --- | --- |
| Addr | Branch-no |

LOAN

|  |  |  |  |
| --- | --- | --- | --- |
| Loan\_no | Amount | Type | Branch-no |

3rd: Building a new table Loans which has two attributes: loan\_no and branch\_no

BANK\_BRANCH

|  |  |
| --- | --- |
| Addr | Branch-no |

LOAN

|  |  |  |
| --- | --- | --- |
| Loan\_no | Amount | Type |

LOANS

|  |  |
| --- | --- |
| Branch-no | Loan\_no |

1. Translating A\_C

There are three different ways to translate the relationship: A\_C

1st: Adding SSN into ACCOUNT

ACCOUNT

|  |  |  |  |
| --- | --- | --- | --- |
| ACCT\_no | Balance | Type | SSN |

CUSTOMER

|  |  |  |  |
| --- | --- | --- | --- |
| Phone | SSN | Name | Addr |

2nd: Adding ACCT\_no into CUSTOMER

ACCOUNT

|  |  |  |
| --- | --- | --- |
| ACCT\_no | Balance | Type |

CUSTOMER

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Phone | SSN | Name | Addr | ACCT\_no |

3rd: Building a new table A\_C which has two attributes: SSN and ACCT\_no

ACCOUNT

|  |  |  |
| --- | --- | --- |
| ACCT\_no | Balance | Type |

CUSTOMER

|  |  |  |  |
| --- | --- | --- | --- |
| Phone | SSN | Name | Addr |

A\_C

|  |  |
| --- | --- |
| ACCT\_no | SSN |

1. Translating L\_C

There are three different ways to translate the relationship: L\_C

1st: Adding SSN into LOAN

LOAN

|  |  |  |  |
| --- | --- | --- | --- |
| Loan\_no | Amount | Type | SSN |

CUSTOMER

|  |  |  |  |
| --- | --- | --- | --- |
| Phone | SSN | Name | Addr |

2nd: Adding ACCT\_no into CUSTOMER

LOAN

|  |  |  |
| --- | --- | --- |
| Loan\_no | Amount | Type |

CUSTOMER

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Phone | SSN | Name | Addr | Loan\_no |

3rd: Building a new table L\_C which has two attributes: SSN and Loan\_no

LOAN

|  |  |  |
| --- | --- | --- |
| Loan\_no | Amount | Type |

CUSTOMER

|  |  |  |  |
| --- | --- | --- | --- |
| Phone | SSN | Name | Addr |

L\_C

|  |  |
| --- | --- |
| Loan\_no | SSN |

A minimal-storage translation:

BANK

|  |  |  |  |
| --- | --- | --- | --- |
| Code | Name | Addr | Branch-no |

BANK\_BRANCH

|  |  |
| --- | --- |
| Addr | Branch-no |

ACCOUNT

|  |  |  |  |
| --- | --- | --- | --- |
| ACCT\_no | Balance | Type | Branch-no |

LOAN

|  |  |  |  |
| --- | --- | --- | --- |
| Loan\_no | Amount | Type | Branch-no |

CUSTOMER

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Phone | SSN | Name | Addr | Loan\_no | ACCT\_no |