**Name:- Dipesh Dhakal**

**ADc9**

Examine the table shown below.

|  |  |  |
| --- | --- | --- |
| branchNo | branchAddress | telNos |
| B001 | 8 Jefferson Way, Portland, OR 97201 | 503-555-3618, 503-555-2727, 503-555-6534 |
| B002 | City Center Plaza, Seattle, WA 98122 | 206-555-6756, 206-555-8836 |
| B003 | 14– 8th Avenue, New York, NY 10012 | 212-371-3000 |
| B004 | 16– 14th Avenue, Seattle, WA 98128 | 206-555-3131, 206-555-4112 |

1. Why is this table not in 1NF?

Ans:- This table is not in 1NF because tables are not separated for each set of related data. For example in table telnos there is three number in same column.

1. Describe and illustrate the process of normalizing the data shown in this table to third normal form (3NF).

**1NF**

|  |  |  |
| --- | --- | --- |
| branchNo | branchAddress | telNos |
| B001 | 8 Jefferson Way, Portland, OR 97201 | 503-555-3618 |
| B002 | City Center Plaza, Seattle, WA 98122 | 206-555-6756 |
| B003 | 14– 8th Avenue, New York, NY 10012 | 212-371-3000 |
| B004 | 16– 14th Avenue, Seattle, WA 98128 | 206-555-3131 |
| B001 | 8 Jefferson way, Portland, Or 97201 | 503-555-2727 |
| B002 | City Center Plaza, Seattle, WA 98122 | 206-555-8836 |
| B001 | 8 Jefferson Way, Portland, OR 97201 | 503-555-6534 |
| B004 | 16– 14th Avenue, Seattle, WA 98128 | 503-555-6534 |

**2NF**

|  |  |  |
| --- | --- | --- |
| branchNo | telNos | telID |
| B001 | 503-555-3618 | T1 |
| B002 | 206-555-6756 | T2 |
| B003 | 212-371-3000 | T3 |
| B004 | 206-555-3131 | T4 |
| B001 | 503-555-2727 | T5 |
| B002 | 206-555-8836 | T6 |
| B001 | 503-555-6534 | T7 |

**2NF**

|  |  |
| --- | --- |
| branchNo | branchAddress |
| B001 | 8 Jefferson Way, Portland, OR 97201 |
| B002 | City Center Plaza, Seattle, WA 98122 |
| B003 | 14– 8th Avenue, New York, NY 10012 |
| B004 | 16– 14th Avenue, Seattle, WA 98128 |

1. Identify the primary, alternate and foreign keys in your 3NF relations.

Ans:- Primary Key:- branchNo

Alternate Key:- brach Address

Foreign Key:- TelId

1. Examine the table shown below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| staffNo | branchNo | branchAddress | name | position | hoursPerWeek |
| S4555 | B002 | City Center Plaza, Seattle, WA 98122 | Ellen Layman | Assistant | 16 |
| S4555 | B00 4 | 16 – 14th Avenue, Seattle, WA 98128 | Ellen Layman | Assistant | 9 |
| S4612 | B002 | City Center Plaza, Seattle, WA 98122 | Dave Sinclair | Assistant | 14 |
| S4612 | B004 | 16 – 14th Avenue, Seattle, WA 98128 | Dave Sinclair | Assistant | 10 |

1. Why is this table not in 2NF?

Ans:- This table is not in table because no non-prime attribute is dependent on the proper subset of any candidate key of table.

1. Describe and illustrate the process of normalizing the data shown in this table to third normal form (3NF).

|  |  |  |
| --- | --- | --- |
| staffNo | name | position |
| S4555 | Ellen Layman | Assistant |
| S4612 | Dave Sinclair | Assistant |

|  |  |
| --- | --- |
| branchNo | branchAddress |
| B002 | City Center Plaza, Seattle, WA 98122 |
| B004 | 16 – 14th Avenue, Seattle, WA 98128 |

|  |  |  |
| --- | --- | --- |
| staffNo | branchNo | hoursPerWeek |
| S4555 | **B002** | 16 |
| S4555 | **B004** | 9 |
| S4612 | **B002** | 14 |
| S4612 | **B004** | 10 |

Identify the primary, (alternate) and foreign keys in your 3NF relations.

Ans:- Primary Key : staffNo, branchNo

Foreign Key : staffNo, branchNo

Alternate key: name, branchaddress

3. Examine the table shown below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| branchNo | branchAddress | telNo | mgrStaffNo | name |
| B001 | 8 Jefferson Way, Portland, OR 97201 | 503-555-3618 | S1500 | Tom Daniels |
| B002 | City Center Plaza, Seattle, WA 98122 | 206-555-6756 | S0010 | Mary Martinez |
| B003 | 14– 8th Avenue, New York, NY 10012 | 212-371-3000 | S0145 | Art Peters |
| B004 | 16– 14th Avenue, Seattle, WA 98128 | 206-555-3131 | S2250 | Sally Stern |

1. Why is this table not in 3NF?

ANS:- This table is not in 3NF because it has transitive functional dependencies

1. Describe and illustrate the process of normalizing the data shown in this table to third normal form (3NF).

|  |  |  |  |
| --- | --- | --- | --- |
| B001 | 8 Jefferson Way, Portland, OR 97201 | 503-555-3618 | S1500 |
| B002 | City Center Plaza, Seattle, WA 98122 | 206-555-6756 | S0010 |
| B003 | 14– 8th Avenue, New York, NY 10012 | 212-371-3000 | S0145 |
| B004 | 16– 14th Avenue, Seattle, WA 98128 | 206-555-3131 | S2250 |

|  |  |
| --- | --- |
| mgrStaffNo | name |
| S1500 | Tom Daniels |

|  |  |
| --- | --- |
| S0010 | Mary Martinez |
| S0145 | Art Peters |
| S2250 | Sally Stern |

Identify the primary, (alternate) and foreign keys in your 3NF relations.

ANS:- Primary key : mgrStaffNo

Foreign Key : mgrStaffNo

Alternate key : branchNo, branchAddress