US#01 - Implementar sistema de cadastro de Hospitais (CRUD)

Task#04 - Realizar a Normalização e Padronização do BD

Normalização na FN3 e Padronização de nomenclaturas do Banco de Dados do Hospital

**NF0**

Nesta forma os dados são aglutinados em uma grande tabela ou tupla:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| cnpj | cnes | name | corporate name | address | phone | cbhpm | description | uco | name | cns\_code | occupation | address | phone | admission\_data | demission\_data | salary |
| 111111 | 999999 | Name 1 | Real name 1 | Address 1 | 11111 | 00000001 | Descripiton 1 | 10 | Joao | 1294375083 | doctor | Address 2 | 7424307 | 01/01/2001 | NULL | 10000 |
| 111111 | 999999 | Name 1 | Real name 1 | Address 1 | 2222 | 00000001 | Descripiton 1 | 10 | Joao | 1294375083 | doctor | Address 2 | 7424307 | 01/01/2001 | NULL | 10000 |
| 111111 | 999999 | Name 1 | Real name 1 | Address 1 | 11111 | 00000002 | Descripiton 2 | 20 | Joao | 1294375083 | doctor | Address 2 | 7424307 | 01/01/2001 | NULL | 10000 |
| 111111 | 999999 | Name 1 | Real name 1 | Address 1 | 11111 | 00000001 | Descripiton 1 | 10 | Maria | 9475375837 | nurse | Address 4 | 7395735 | 10/10/2018 | NULL | 2500 |
| 222222 | 888888 | Name 2 | Real name 2 | Address 3 | 33333 | 00000001 | Descripiton 1 | 10 | Manuel | 5475495739 | nurse | Address 5 | 3775495 | 22/11/2015 | NULL | 3000 |
| 222222 | 888888 | Name 2 | Real name 2 | Address 3 | 44444 | 00000001 | Descripiton 1 | 10 | Manuel | 5475495739 | nurse | Address 5 | 3775495 | 22/11/2015 | NULL | 3000 |
| 222222 | 888888 | Name 2 | Real name 2 | Address 3 | 33333 | 00000001 | Descripiton 1 | 10 | Ivan | 5957932793 | doctor | Address 6 | 6964050 | 05/05/2005 | NULL | 8000 |
| 222222 | 888888 | Name 2 | Real name 2 | Address 3 | 33333 | 00000001 | Descripiton 1 | 10 | Ivan | 5957932793 | doctor | Address 6 | 8377744 | 05/05/2005 | NULL | 8000 |

É possível observar diversas anomalias de inserção, exclusão e alteração devido à falta de organização das dependências funcionais, campos/colunas multivalorados (amarelo) e compostos (vermelho).

**NF1**

Nesta forma procura-se agrupar os campos/colunas com outros campos/colunas chaves (dependência funcional) e remover os campos/colunas multivalorados e compostos tornando cada registro átomo.

1º Passo – Resolver as dependências funcionais

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Hospital | | | | | | |
| **id** | cnpj | cnes | name | corporate name | address | phone |
| 1 | 111111 | 999999 | Name 1 | Real name 1 | Address 1 | 11111 |
| 1 | 111111 | 999999 | Name 1 | Real name 1 | Address 1 | 2222 |
| 2 | 222222 | 888888 | Name 2 | Real name 2 | Address 3 | 33333 |
| 2 | 222222 | 888888 | Name 2 | Real name 2 | Address 3 | 44444 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Medical procedure | | | | |
| **id** | cbhpm | description | uco | hospital\_id |
| 1 | 00000001 | Descripiton 1 | 10 | 1 |
| 2 | 00000002 | Descripiton 2 | 20 | 1 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Employee | | | | | | |
| **id** | name | cns\_code | occupation | address | phone | hospital\_id |
| 1 | Joao | 1294375083 | doctor | Address 2 | 7424307 | 1 |
| 2 | Maria | 9475375837 | nurse | Address 4 | 7395735 | 1 |
| 3 | Manuel | 5475495739 | nurse | Address 5 | 3775495 | 2 |
| 4 | Ivan | 5957932793 | doctor | Address 6 | 6964050 | 2 |
| 4 | Ivan | 5957932793 | doctor | Address 6 | 8377744 | 2 |

2º Passo – Eliminar os campos multivalorados (destacados em amarelo) e compostos (destacados em vermelho)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Hospital | | | | | |
| **id** | cnpj | cnes | name | corporate name | address\_id |
| 1 | 111111 | 999999 | Name 1 | Real name 1 | 1 |
| 2 | 222222 | 888888 | Name 2 | Real name 2 | 3 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Address | | | | | | | |
| **id** | street | number | city | state | country | zip\_code |
| 1 | Address A | 999999 | City A | State A | Contry A | 38746509 |
| 2 | Address B | 888888 | City B | State B | Contry A | 97498473 |
| 3 | Address C | 999999 | City C | State C | Contry A | 85784949 |
| 4 | Address D | 888888 | City D | State D | Contry A | 49873687 |
| 5 | Address E | 777777 | City E | State E | Contry A | 03837739 |

|  |  |
| --- | --- |
| Hospital\_Contact | |
| **hospital\_id** | **contact\_id** |
| 1 | 1 |
| 1 | 2 |
| 2 | 3 |
| 2 | 4 |

|  |  |  |
| --- | --- | --- |
| Contact | | |
| **id** | description | type |
| 1 | 111111 | 999999 |
| 2 | 222222 | 999999 |
| 3 | 333333 | 888888 |
| 4 | 444444 | 888888 |

**2FN**

Remover referências parciais, onde um campo não-chave depende somente de parte da chave. Separar em tabelas, de acordo com as dependências funcionais e multivaloradas.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Hospital** | | | | | |
| **id** | cnpj | cnes | name | corporate name | address\_id |
| 1 | 111111 | 999999 | Name 1 | Real name 1 | 1 |
| 2 | 222222 | 888888 | Name 2 | Real name 2 | 3 |

|  |  |
| --- | --- |
| Hospital\_Employee | |
| **hospital\_id** | **emploee\_id** |
| 1 | 1 |
| 1 | 2 |
| 2 | 3 |
| 2 | 4 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Employee | | | | | | | | |
| **id** | name | cns\_code | occupatin | admission\_data | demission\_data | salary | address\_id |
| 1 | Joao | 1294375083 | doctor | 01/01/2001 | NULL | 10000 | 3 |
| 2 | Maria | 9475375837 | nurse | 10/10/2018 | NULL | 2500 | 4 |
| 3 | Manuel | 5475495739 | nurse | 22/11/2015 | NULL | 3000 | 5 |
| 4 | Ivan | 5957932793 | doctor | 05/05/2005 | NULL | 8000 | 6 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Address | | | | | | | |
| **id** | street | number | city | state | country | zip\_code |
| 1 | Address A | 999999 | City A | State A | Contry A | 38746509 |
| 2 | Address B | 888888 | City B | State B | Contry A | 97498473 |
| 3 | Address C | 999999 | City C | State C | Contry A | 85784949 |
| 4 | Address D | 888888 | City D | State D | Contry A | 49873687 |
| 5 | Address E | 777777 | City E | State E | Contry A | 03837739 |

**3FN**

Remover referências transitivas, onde um campo não-chave depende de outro campo não chave, ou seja, cada um de seus Atributos Não Chave estiver referindo-se diretamente a Chave.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Hospital** | | | | | |
| **id** | cnpj | cnes | name | corporate name | address\_id |
| 1 | 111111 | 999999 | Name 1 | Real name 1 | 1 |
| 2 | 222222 | 888888 | Name 2 | Real name 2 | 3 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Hospital\_Employee | | | | |
| **hospital\_id** | **emploee\_id** | admission\_data | demission\_data | salary |
| 1 | 1 | 01/01/2001 | NULL | 10000 |
| 1 | 2 | 10/10/2018 | NULL | 2500 |
| 2 | 3 | 22/11/2015 | NULL | 3000 |
| 2 | 4 | 05/05/2005 | NULL | 8000 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Employee | | | | |
| **id** | name | cns\_code | occupatin | address\_id |
| 1 | Joao | 1294375083 | doctor | 3 |
| 2 | Maria | 9475375837 | nurse | 4 |
| 3 | Manuel | 5475495739 | nurse | 5 |
| 4 | Ivan | 5957932793 | doctor | 6 |

Neste exemplo admission\_data, demission\_data e salary não depende de uma relação apenas com a tabela Employee como também está ligado a tabela Hospital e inclusive um funcionário pode trabalhar em mais de um hospital e o ideal é deslocar os campos/colunas para a tabela Hospital\_Employee.