Q2.

First normal form (1NF)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S\_id** | **Student\_name** | **Address** | **Email** | **Class\_name** | **Major** |
| S1 | Joe Green | 124 Main St. | Joe@shcool.edu | IT1025 | programming |
| S1 | Joe Green | 124 Main St. | Joe@shcool.edu | Math1200 | programming |
| S1 | Joe Green | 124 Main St. | Joe@shcool.edu | IT1050 | programming |
| S1 | Joe Green | 124 Main St. | Joe@shcool.edu | IT2351 | programming |
| S2 | Sue Smith | 345 second St. | sue@school.edu | IT1025 | programming |
| S2 | Sue Smith | 345 second St. | sue@school.edu | IT1050 | programming |
| S2 | Sue Smith | 345 second St. | sue@school.edu | IT2351 | programming |
| S3 | Nick Green | 45 York road | nick@school.edu | 1025 | Networking |
| S4 | Andy Andrews | Andy Andrews | 600 5th ave | 1025 | Networking |
| S4 | Andy Andrews | Andy Andrews | 600 5th ave | 1050 | Networking |

In first normal form the repetitive data is segregated, and any column does not have the repetition of data. For normalization four more rows are added. The repeating values in the row can be resolved in second normal form.

**Second normal form (2NF)**

There are three table for the process of 2NF. Primary key is S\_id and non- key column like Student\_name, address, and email depend on primary key. We moved columns class and major that do not depend on primary key.

T1 primary key= S\_id

|  |  |  |  |
| --- | --- | --- | --- |
| **S\_id** | **Student\_name** | **Address** | **Email** |
| S1 | Joe Green | 124 main St. | Joe@school.edu |
| S2 | Sue Smith | 345 second St. | sue@school.edu |
| S3 | Nick green | 45 York road | nick@school.edu |
| S4 | Andy Andrews | 600 5th ave | andy@school.edu |

T3 foreign key= Class\_id.

|  |  |  |
| --- | --- | --- |
| Class\_id | Class\_name | Major |
| 1 | IT1025 | Programming |
| 2 | Math 1200 | Programming |
| 3 | IT 1050 | Programming |
| 4 | IT 2351 | Programming |
| 5 | 1025 | Networking |
| 6 | 1050 | Networking |

Foreign keys are S\_id, Class\_id. **Student** \_**transection table**

|  |  |  |
| --- | --- | --- |
| Id | **S\_id** | **Class\_id** |
| 1 | 1 | 1 |
| 2 | 1 | 2 |
| 3 | 1 | 3 |
| 4 | 1 | 4 |
| 5 | 2 | 1 |
| 6 | 2 | 3 |
| 7 | 2 | 4 |
| 8 | 3 | 5 |
| 9 | 4 | 5 |
| 10 | 4 | 6 |

**THIRD NORMAL FORM**

**Table= class**

|  |  |  |
| --- | --- | --- |
| Class\_id | Class\_name | Major\_id |
| 1 | IT1025 | 1 |
| 2 | Math 1200 | 1 |
| 3 | IT 1050 | 1 |
| 4 | IT 2351 | 1 |
| 5 | 1025 | 2 |
| 6 | 1050 | 2 |

|  |  |
| --- | --- |
| Major\_id | Major |
| 1 | Programming |
| 2 | Networking |

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- creating database assgnment5

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- create database

DROP DATABASE IF EXISTS assignment5;

CREATE DATABASE assignment5;

-- select database

USE assignment5;

-- create tables

CREATE TABLE student (

S\_id INT not null PRIMARY KEY,

Student\_name VARCHAR(15) not null,

Student\_Address VARCHAR(25) not null,

Student\_email VARCHAR(25)

);

CREATE TABLE major (

Major\_id INT not null PRIMARY KEY,

Major VARCHAR(20)

);

CREATE TABLE CLASS (

Class\_id INT not null PRIMARY KEY,

Class\_name VARCHAR(15),

Major\_id INT NOT NULL,

CONSTRAINT major\_details\_fk\_

FOREIGN KEY (Major\_id)

REFERENCES major (Major\_id)

);

CREATE TABLE Student\_transection(

Transection\_id INT not null PRIMARY KEY,

student\_id INT not null,

class\_id INT not null,

CONSTRAINT student\_fk\_id

FOREIGN KEY (student\_id)

REFERENCES Student (S\_id),

CONSTRAINT class\_fk\_id

FOREIGN KEY (class\_id)

REFERENCES Class (Class\_id)

);

INSERT INTO student VALUES

(1, 'Joe Green' , '124 main st' , 'joe@school.edu'),

(2, 'sue smith' , '345 second st' , 'sue@school.edu') ,

(3, 'Nick Green' , ' 45 york road' , 'Nick@school.edu') ,

(4, 'Andy Andrews' , ' 600 5th Ave' , 'andy@school.edu'),

(5, 'sara tim' , '6705 Ave' , 'sara@school.edu'),

(6, 'Emmi Ali' , '700 Ave' , 'emmi@school.edu') ,

(7, ' Afnan' , ' 900 Twin Road' , ' afnan@school.edu') ,

(8, ' Gretta sam', ' 786 st' , 'gretta@school.edu');

INSERT INTO Major VALUES

( 1, 'programming' ) ,

( 2, 'Networking' ) ,

( 3, 'Database'),

( 4, 'Java');

INSERT INTO class Values

( 1, 'IT1025' , '1') ,

(2, 'Math1200' , '1') ,

(3, 'IT1050' , '1') ,

(4, 'IT2351' , '1') ,

(5, 'IT1025' , '2') ,

(6, 'IT1050' , '2') ,

(7, '2700', '3'),

(8, '2571', '4'),

(9, '45001', '3'),

(10, '9201', '4');

INSERT INTO student\_transection VALUES

( 1, 1 , 1) ,

( 2, 1 , 2) ,

( 3, 1 , 3) ,

( 4, 1 , 4) ,

( 5, 2 , 1) ,

( 6, 2 , 3) ,

( 7, 2 , 4) ,

( 8, 3 , 5) ,

( 9, 4 , 5) ,

( 10, 4 , 6),

( 11, 5 , 7),

( 12, 6 , 8),

( 13, 7 , 9),

( 14, 8, 10);

