To achieve 1st normal form:

Each student should not a one to many relationship in a table so create a new row for each class that a student has

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Student ID | Student Name | Address | Email | Classes | Major |
| S1 | John Jones | 124 main st. | [Joe@school.edu](mailto:Joe@school.edu) | IT1025 | Programming and Development |
| S1 | John Jones | 124 main st. | [Joe@school.edu](mailto:Joe@school.edu) | MATH1200 | Programming and Development |
| S1 | John Jones | 124 main st. | [Joe@school.edu](mailto:Joe@school.edu) | IT1050 | Programming and Development |
| S2 | Sue Smith | 345 second st. | [Sue@school.edu](mailto:Sue@school.edu) | IT1025 | Programming and Development |
| S2 | Sue Smith | 345 second st. | [Sue@school.edu](mailto:Sue@school.edu) | IT1050 | Programming and Development |
| S2 | Sue Smith | 345 second st. | [Sue@school.edu](mailto:Sue@school.edu) | IT2351 | Programming and Development |
| S3 | Nick Foyar | 45 york road | [Nick@school.edu](mailto:Nick@school.edu) | 1025 | Networking |
| S4 | Andy Andrews | 600 5th ave. | [Andy@school.edu](mailto:Andy@school.edu) | 1025 | Networking |
| S4 | Andy Andrews | 600 5th ave. | [Andy@school.edu](mailto:Andy@school.edu) | 1050 | Networking |

To achieve 2nd normal form:

Given the primary key student id, recognize that class and major are not dependent on student id

|  |  |  |  |
| --- | --- | --- | --- |
| Student ID | Student Name | Address | Email |
| S1 | John Jones | 124 main st. | [Joe@school.edu](mailto:Joe@school.edu) |
| S2 | Sue Smith | 345 second st. | [Sue@school.edu](mailto:Sue@school.edu) |
| S3 | Nick Foyar | 45 york road | [Nick@school.edu](mailto:Nick@school.edu) |
| S4 | Andy Andrews | 600 5th ave. | [Andy@school.edu](mailto:Andy@school.edu) |
|  |  |  |  |
| Student ID | Classes | Major |  |
| S1 | IT1025 | Programming and Development |  |
| S1 | MATH1200 | Programming and Development |  |
| S1 | IT1050 | Programming and Development |  |
| S2 | IT1025 | Programming and Development |  |
| S2 | IT1050 | Programming and Development |  |
| S2 | IT2351 | Programming and Development |  |
| S3 | 1025 | Networking |  |
| S4 | 1025 | Networking |  |
| S4 | 1050 | Networking |  |

To achieve 3rd normal form:

Student address is dependent on the student name not the id

|  |  |  |
| --- | --- | --- |
| Student Name | Address |  |
| John Jones | 124 main st. |  |
| Sue Smith | 345 second st. |  |
| Nick Foyar | 45 york road |  |
| Andy Andrews | 600 5th ave. |  |
|  |  |  |
| Student ID | Student Name | Email |
| S1 | John Jones | [Joe@school.edu](mailto:Joe@school.edu) |
| S2 | Sue Smith | [Sue@school.edu](mailto:Sue@school.edu) |
| S3 | Nick Foyar | [Nick@school.edu](mailto:Nick@school.edu) |
| S4 | Andy Andrews | [Andy@school.edu](mailto:Andy@school.edu) |
|  |  |  |
| Student ID | Classes | Major |
| S1 | IT1025 | Programming and Development |
| S1 | MATH1200 | Programming and Development |
| S1 | IT1050 | Programming and Development |
| S2 | IT1025 | Programming and Development |
| S2 | IT1050 | Programming and Development |
| S2 | IT2351 | Programming and Development |
| S3 | 1025 | Networking |
| S4 | 1025 | Networking |
| S4 | 1050 | Networking |