Students

|  |  |
| --- | --- |
| stud\_id | stud\_name |
| 1234 | John Smith |
| 9555 | Peter |

Subjects

|  |  |
| --- | --- |
| subj\_code | subj\_title |
| ITM2005 | System Architecture |
| ACS1005 | Data Mgmt |
| PRG1001 | Programming I |

Results

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| stud\_id | subj\_code | Sem | Year | staff\_id | convenor | mark | grade |
| 1234 | ITM2005 | 1 | 2015 | 111 | Bob Hauser | 83 | D |
| 1234 | ACS1005 | 2 | 2015 | 222 | Jane Collins | 44 | N |
| 9555 | ITM20005 | 1 | 2015 | 111 | Bob Hauser | 95 | HD |
| 9555 | PRG1001 | 2 | 2015 | 333 | Ahmad Singh | 65 | C |

To establish the second normal form, all attributes (non-key attributes) are to be dependent on the key. The prime key attributes are stud\_id, subj\_code and sem\_year. The stud\_name can be determined by only stud\_id, which makes the relation Partial Dependent. The sub\_title can be determined by only subj\_code, which makes the relation Partial Dependent. Students can sometimes fail a subject, and will have to retake the subject which is why it is important to account for sem\_year. By removing stud\_name and subj\_title from the table, all other attributes defined by the composite key of stud\_id, subj\_code and sem\_year. Putting stud\_id and stud\_name into a separate table gives us a students table. The stud\_id in the students table can now be used as a foreign key to the results table. The stud\_name no longer has any repeats. Achieving 2NF eliminates partial dependencies, which are considered design-anomalies and indicate potential duplication.