CLASS 02 – Normalization

**UNNORMALIZED**

transcript = (student\_id, firstname, lastname, program\_number, program\_name, {course\_number, course\_title, grade}, crc\_score)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| student\_id | firstname | lastname | program\_number | program\_name |  | crc\_score |
| 1 | Steph | Moreau | Abc | Alphabeth | |  |  |  | | --- | --- | --- | | course\_number | course\_title | grade | | 99 | Database | 99.9 | | 88 | Programming | 98.9 | | 77 | Design | 97.5 | | 26 |
| 2 | John | Johnston | Xyz | Numbers | |  |  |  | | --- | --- | --- | | course\_number | course\_title | grade | | 99 | Database | 94 | | 66 | Drawing | 97 | | 23 |

**1NF**

Transcript = (student\_id, firstname, lastname, program\_number, program\_name, course\_number, course\_title, grade, crc\_score)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **student\_id** | firstname | Lastname | program\_number | program\_name | **course\_number** | course\_title | grade | crc\_score |
| 1 | Steph | Moreau | Abc | Alphabeth | 99 | Database | 99.9 | 26 |
| 1 | Steph | Moreau | Abc | Alphabeth | 88 | Programming | 98.9 | 26 |
| 1 | Steph | Moreau | Abc | Alphabeth | 77 | Design | 97.5 | 26 |
| 2 | John | Johnston | Xyz | Numbers | 99 | Database | 94 | 23 |
| 2 | John | Johnston | Xyz | Numbers | 66 | Drawing | 97 | 23 |

**2NF**

Student = (student\_id, firstname, lastname, program\_number, program\_name, crc\_score)

Course = (course\_number, course\_title)

Grade = (student\_id, course\_ number, grade)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **student\_id** | firstname | lastname | program\_number | program\_name | crc\_score |
| 1 | Steph | Moreau | Abc | Alphabeth | 26 |
| 2 | John | Johnston | Xyz | Numbers | 23 |

|  |  |
| --- | --- |
| **course\_number** | course\_title |
| 99 | Database |
| 88 | Programming |
| 77 | Design |
| 66 | Drawing |

|  |  |  |
| --- | --- | --- |
| **student\_id** | **course\_number** | grade |
| 1 | 99 | 99.9 |
| 1 | 88 | 98.9 |
| 1 | 77 | 97.5 |
| 2 | 99 | 94 |
| 2 | 66 | 97 |

**3NF**

Student = (student\_id, firstname, lastname, program\_number, crc\_score)

Course = (course\_number, course\_title)

Grade = (student\_id, course\_ number, grade)

Program = (program\_number, program\_name)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **student\_id** | firstname | lastname | program\_number | crc\_score |
| 1 | Steph | Moreau | Abc | 26 |
| 2 | John | Johnston | Xyz | 23 |

|  |  |
| --- | --- |
| **course\_number** | course\_title |
| 99 | Database |
| 88 | Programming |
| 77 | Design |
| 66 | Drawing |

|  |  |  |
| --- | --- | --- |
| **student\_id** | **course\_number** | grade |
| 1 | 99 | 99.9 |
| 1 | 88 | 98.9 |
| 1 | 77 | 97.5 |
| 2 | 99 | 94 |
| 2 | 66 | 97 |

|  |  |
| --- | --- |
| **program\_number** | program\_name |
| Abc | Alphabeth |
| Xyz | Numbers |