**NORMALIZATION**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| UNIVERSITY | **University\_ID** | U1 | SCHOOL | **School\_ID** | S1 |
| University name | U2 | School name | S2 |
| University\_ID | U1 |
| DEPARTMENT | **Department\_ID** | D1 | PROGRAM | **Program\_ID** | P1 |
| Dept. name | D2 | Program name | P2 |
| School\_ID | S1 | Department\_ID | D1 |
| CO | **CO\_ID** | C1 | PLO | **PLO\_ID** | P11 |
| CO\_Number | C2 | PLO\_Number | P12 |
| Description | C3 | Description | P13 |
| PLO\_ID | P11 | Program\_ID | P1 |
| COURSE | **Course\_ID** | C11 | ASSESSMENT | **Assessment\_ID** | A1 |
| Course name | C12 | Assessment name | A2 |
| Description | C13 | Marks | A3 |
| Credit | C14 | Ques. No | A4 |
| Course type | C15 | CO\_ID | C1 |
| Program\_ID | P1 | Student\_ID | S111 |
| Section\_ID | S11 |
| SECTION | **Section\_ID** | S11 | ENROLLMENT | **Enroll\_ID** | E1 |
| Course\_ID | C11 | **Section\_ID** | S11 |
| Faculty\_ID | F1 | Student\_ID | S111 |
| Section no | S12 | Semester | E2 |
| Semester | S13 | Year | E3 |
| FACULTY | **Faculty\_ID** | F1 | STUDENT | **Student\_ID** | S111 |
| Department\_ID | D1 | Program\_ID | P1 |
| Fname | F2 | Fname | S112 |
| Lname | F3 | Lname | S113 |
| Gender | F4 | Gender | S114 |
| Address | F5 | Address | S115 |
| Date of Birth | F6 | Date of birth | S116 |
| Email | F7 | Email | S117 |
| Phone | F8 | Phone | S118 |
| EVALUATION | **Evaluation\_ID** | E11 |  |  |  |
| Marks obtained | E12 |
| Evaluation no | E13 |
| Assessment\_ID | A1 |
| Faculty\_ID | F1 |
| Enroll\_ID | E1 |

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| **U1→** | U2 |
| **S1→** | S2, U1 |
| **D1→** | D2, S1 |
| **P1→** | P2, D1 |
| **C1→** | C2, C3, P11 |
| **P11→** | P12, P13, P1 |
| **C11→** | C12, C13, C14, C15, P1 |
| **S11→** | S12, S13, C11, F1 |
| **E1→** | E2, E3, S11, S111 |
| **S111→** | S112, S113, S114, S115, S116, S117, S118, P1 |
| **F1→** | F2, F3, F4, F5, F6, F7, F8, D1 |
| **A1→** | A2, A3, A4, C1, S111, S11 |
| **E11→** | E12, E13, A1, F1, E1 |

|  |  |
| --- | --- |
| **University\_ID→** | University name |
| **School\_ID→** | School name, University\_ID |
| **Department\_ID→** | Department name, School\_ID |
| **Program\_id→** | Program name, Department\_ID |
| **CO\_ID→** | CO number, Description, PLO\_ID |
| **PLO\_ID→** | PLO number, Description, Program\_ID |
| **Course\_ID→** | Course name, Description, Credit, Course type, Program\_ID |
| **Section\_ID→** | Section no, Semester, Course\_ID, Faculty\_ID |
| **Enroll\_ID→** | Semester, Year, Section\_ID, Student\_ID |
| **Student\_ID→** | Fname, Lname, Gender, Address, Date of Birth, Email, Phone, Program\_ID |
| **Faculty\_ID→** | Fname, Lname, Gender, Address, Date of Birth, Email, Phone, Department\_ID |
| **Assessment\_ID→** | Assessment name, Marks, Ques. no, CO\_ID, Student\_ID, Section\_ID |
| **Evaluation\_ID→** | Marks Obtained, Evaluation no, Assessment\_ID, Faculty\_ID, Enroll\_ID |

**1NF**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **E11** | E12 | E13 | U1 | U2 | S1 | S2 | D1 | D2 | P1 | P2 | C1 | C2 | C3 | P11 | P12 |
| P13 | C11 | C12 | C13 | C14 | C15 | S11 | S12 | S13 | E1 | E2 | E3 | S111 | S112 | S113 | S114 |
| S115 | S116 | S117 | S118 | F1 | F2 | F2 | F4 | F5 | F6 | F7 | F8 | A1 | A2 | A3 | A4 |

**2NF**

The relations are already in 2nf.

**3NF**

|  |  |
| --- | --- |
| **U1** | U2 |

|  |  |  |
| --- | --- | --- |
| **S1** | S2 | U1 |

|  |  |  |
| --- | --- | --- |
| **D1** | D2 | S1 |

|  |  |  |  |
| --- | --- | --- | --- |
| **P11** | P12 | P13 | P1 |

|  |  |  |
| --- | --- | --- |
| **P1** | P2 | D1 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S111** | S112 | S113 | S114 | S115 | S115 | S117 | S118 | P1 |

|  |  |  |  |
| --- | --- | --- | --- |
| **C1** | C2 | C3 | P11 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S11** | S12 | S13 | C11 | F1 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **A1** | A2 | A3 | A4 | C1 | S111 | S11 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **E11** | E12 | E13 | A1 | F1 | E1 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **E1** | E2 | E3 | S11 | S111 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **F1** | F2 | F3 | F4 | F5 | F6 | F7 | F8 | D1 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| P1 | C12 | C13 | C14 | C15 | **C11** |

**BCNF**

No non-key can identify any primary key or part of the primary key. Therefore, all the relations are in BCNF.