|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Name** | **Module Code** | **Module Name** | **Module Leader id** | **Module Leader Name** | **Student Number** | **Student Name** | **Address Id** | **City** | **Country** | **Age** |
| 10 | Computing | CSY1020 | Databases | 1 | Mark Jones | 11456 | Ram Thapa | 11 | Kathmandu | Nepal | 21 |
| 10 | Computing | CSY1020 | Databases | 1 | Mark Jones | 11457 | Shyam Thapa | 22 | London | UK | 22 |
| 10 | Computing | CSY1020 | Databases | 1 | Mark Jones | 11458 | Hari Bahadur | 33 | Delhi | India | 24 |
| 11 | Networking | CSY3019 | Media Technology | 2 | John Smith | 11459 | Rita Jones | 22 | London | UK | 23 |
| 11 | Networking | CSY3019 | Media Technology | 2 | John Smith | 11460 | Sita  Smith | 22 | London | UK | 20 |
| 11 | Networking | CSY3019 | Media Technology | 2 | John Smith | 11461 | Geeta  Jones | 44 | New York | USA | 21 |
| 12 | Computer Science | CSY3020 | Artificial Intelligence | 3 | David Brown | 11462 | Rajesh Smith | 33 | Delhi | India | 21 |
| 12 | Computer Science | CSY3020 | Artificial Intelligence | 3 | David Brown | 11463 | Ramesh Brown | 11 | Kathmandu | Nepal | 23 |
| 12 | Computer Science | CSY3020 | Artificial Intelligence | 3 | David Brown | 11464 | Suresh  Brown | 33 | Delhi | India | 23 |

**UNF (Unnormalized Form)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Student Number** | **Student Name** | **Address Id** | **City** | **Country** | **Age** |
| 10 | 11456 | Ram Thapa | 11 | Kathmandu | Nepal | 21 |
| 10 | 11457 | Shyam Thapa | 22 | London | UK | 22 |
| 10 | 11458 | Hari Bahadur | 33 | Delhi | India | 24 |
| 11 | 11459 | Rita Jones | 22 | London | UK | 23 |
| 11 | 11460 | Sita  Smith | 22 | London | UK | 20 |
| 11 | 11461 | Geeta  Jones | 44 | New York | USA | 21 |
| 12 | 11462 | Rajesh Smith | 33 | Delhi | India | 21 |
| 12 | 11463 | Ramesh Brown | 11 | Kathmandu | Nepal | 23 |
| 12 | 11464 | Suresh  Brown | 33 | Delhi | India | 23 |

**1NF (First Normal Form)** -> Rules: Repeating groups moved to another table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Name** | **Module Code** | **Module Name** | **Module Leader id** | **Module Leader Name** |
| 10 | Computing | CSY1020 | Databases | 1 | Mark Jones |
| 11 | Networking | CSY3019 | Media Technology | 2 | John Smith |
| 12 | Computer Science | CSY3020 | Artificial Intelligence | 3 | David Brown |

**2NF (Second Normal Form)**-> Rules: Must be in 1NF, non-key items must be dependent of the whole key

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Name** | **Module Code** | **Module Name** | **Module Leader id** | **Module Leader Name** |
| 10 | Computing | CSY1020 | Databases | 1 | Mark Jones |
| 11 | Networking | CSY3019 | Media Technology | 2 | John Smith |
| 12 | Computer Science | CSY3020 | Artificial Intelligence | 3 | David Brown |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Code** | **Student Number** | **Student Name** | **Address Id** | **Age** |
| 10 | 11456 | Ram Thapa | 11 | 21 |
| 10 | 11457 | Shyam Thapa | 22 | 22 |
| 10 | 11458 | Hari Bahadur | 33 | 24 |
| 11 | 11459 | Rita Jones | 22 | 23 |
| 11 | 11460 | Sita  Smith | 22 | 20 |
| 11 | 11461 | Geeta  Jones | 44 | 21 |
| 12 | 11462 | Rajesh Smith | 33 | 21 |
| 12 | 11463 | Ramesh Brown | 11 | 23 |
| 12 | 11464 | Suresh  Brown | 33 | 23 |

|  |  |  |
| --- | --- | --- |
| **Address Id** | **City** | **Country** |
| 11 | Kathmandu | Nepal |
| 22 | London | UK |
| 33 | Delhi | India |
| 44 | New York | USA |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Code** | **Student Number** | **Student Name** | **Address Id** | **Age** |
| 10 | 11456 | Ram Thapa | 11 | 21 |
| 10 | 11457 | Shyam Thapa | 22 | 22 |
| 10 | 11458 | Hari Bahadur | 33 | 24 |
| 11 | 11459 | Rita Jones | 22 | 23 |
| 11 | 11460 | Sita  Smith | 22 | 20 |
| 11 | 11461 | Geeta  Jones | 44 | 21 |
| 12 | 11462 | Rajesh Smith | 33 | 21 |
| 12 | 11463 | Ramesh Brown | 11 | 23 |
| 12 | 11464 | Suresh  Brown | 33 | 23 |

**3NF (Third Normal Form)->** Rules: Must be in 2NF, non-key items do not depend on each other

|  |  |
| --- | --- |
| **Course Code** | **Course Name** |
| 10 | Computing |
| 11 | Networking |
| 12 | Computer Science |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Code** | **Module Code** | **Module Name** | **Module Leader id** | **Module Leader Name** |
| 10 | CSY1020 | Databases | 1 | Mark Jones |
| 11 | CSY3019 | Media Technology | 2 | John Smith |
| 12 | CSY3020 | Artificial Intelligence | 3 | David Brown |

|  |  |  |
| --- | --- | --- |
| **Address Id** | **City** | **Country** |
| 11 | Kathmandu | Nepal |
| 22 | London | UK |
| 33 | Delhi | India |
| 44 | New York | USA |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Course Code** | **Student Number** | **Student Name** | **Address Id** | **Age** |
| 10 | 11456 | Ram Thapa | 11 | 21 |
| 10 | 11457 | Shyam Thapa | 22 | 22 |
| 10 | 11458 | Hari Bahadur | 33 | 24 |
| 11 | 11459 | Rita Jones | 22 | 23 |
| 11 | 11460 | Sita  Smith | 22 | 20 |
| 11 | 11461 | Geeta  Jones | 44 | 21 |
| 12 | 11462 | Rajesh Smith | 33 | 21 |
| 12 | 11463 | Ramesh Brown | 11 | 23 |
| 12 | 11464 | Suresh  Brown | 33 | 23 |

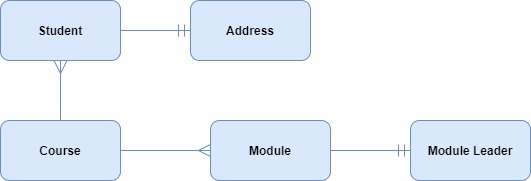
**BCNF (Boyce-Codd Normal Form):** After 3NF if still anomalies persist due to more than one candidate key

|  |  |
| --- | --- |
| **Course Code** | **Course Name** |
| 10 | Computing |
| 11 | Networking |
| 12 | Computer Science |

|  |  |  |  |
| --- | --- | --- | --- |
| **Course Code** | **Module Code** | **Module Name** | **Module Leader id** |
| 10 | CSY1020 | Databases | 1 |
| 11 | CSY3019 | Media Technology | 2 |
| 12 | CSY3020 | Artificial Intelligence | 3 |

|  |  |
| --- | --- |
| **Module Leader id** | **Module Leader Name** |
| 1 | Mark Jones |
| 2 | John Smith |
| 3 | David Brown |

|  |  |  |
| --- | --- | --- |
| **Address Id** | **City** | **Country** |
| 11 | Kathmandu | Nepal |
| 22 | London | UK |
| 33 | Delhi | India |
| 44 | New York | USA |



*Entity Relationship Diagram*