**The Database Normalization Process**

**Unnormalized tables** – tables which contain one or more repeating groups

**User**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Username** | **Password** | **Name** | **Balance** | **DOB** | **Email** |
| dano | password123 | Daniel Hamarik | 125 | 1996-02-12 | daniel.hamarik@gmail.com |
| naxxo | atanas96 | Atanas Latinov | 72 | 1996-05-17 | naxxo.king@gmail.com |
| iamstefan | 123456 | Stefan Aleksiev | 89 | 1996-09-15 | iamstefanaleksiev@gmail.com |

**Ticket**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TicketNo** | **Username** | **totalOdd** | **Money** | **Status** | **Time** | **MatchID** | **Team1** | **Team2** | **Score1** | **Score2** | **Time** | **Type** | **Bet** | **Status** |
| 1 | dano | 4.2 | 10.0 | WIN | 2016-05-12  15:28:15 | 101 | Barcelona | Real Madrid | 0 | 3 | 2016-05-12  15:00:00 | Football | 1 | Lose |
| 105 | Liverpool | Bayern | 2 | 1 | 2016-05-12  16:00:00 | Football | 1 | Win |
| 2 | naxxo | 7.1 | 5.0 | LOSE | 2016-05-12  18:42:38 | 102 | Manchester | Juventus | 0 | 0 | 2016-05-12  19:00:00 | Football | X | Win |
| 103 | Horsens | Vejle | 4 | 1 | 2016-05-12  15:30:00 | Football | 2 | Lose |
| 105 | Liverpool | Bayern | 2 | 1 | 2016-05-12  16:00:00 | Football | 2 | Lose |

**First normal form** – A relation in which the intersection of each row and column contains one and only one value

**User**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Username** | **Password** | **Name** | **Balance** | **DOB** | **Email** |
| dano | password123 | Daniel Hamarik | 125 | 1996-02-12 | daniel.hamarik@gmail.com |
| naxxo | atanas96 | Atanas Latinov | 72 | 1996-05-17 | naxxo.king@gmail.com |
| iamstefan | 123456 | Stefan Aleksiev | 89 | 1996-09-15 | iamstefanaleksiev@gmail.com |

**Ticket**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TicketNo** | **UserName** | **totalOdd** | **Money** | **Status** | **Time** | **MatchID** | **Team1** | **Team2** | **Score1** | **Score2** | **Time** | **Type** | **Bet** | **Status** |
| 1 | dano | 4.2 | 10.0 | WIN | 2016-05-12  15:28:15 | 101 | Barcelona | Real Madrid | 0 | 3 | 2016-05-12  15:00:00 | Football | 1 | Lose |
| 1 | dano | 4.2 | 10.0 | WIN | 2016-05-12  15:28:15 | 105 | Liverpool | Bayern | 2 | 1 | 2016-05-12  16:00:00 | Football | 1 | Win |
| 2 | naxxo | 7.1 | 5.0 | LOSE | 2016-05-12  18:42:38 | 102 | Manchester | Juventus | 0 | 0 | 2016-05-12  19:00:00 | Football | X | Win |
| 2 | naxxo | 7.1 | 5.0 | LOSE | 2016-05-12  18:42:38 | 103 | Horsens | Vejle | 4 | 1 | 2016-05-12  15:30:00 | Football | 2 | Lose |
| 2 | naxxo | 7.1 | 5.0 | LOSE | 2016-05-12  18:42:38 | 105 | Liverpool | Bayern | 2 | 1 | 2016-05-12  16:00:00 | Football | 2 | Lose |

**Second Normal Form** – A relation that is in the first normal form and all non-key attributes are fully functionally dependent on the primary key

For security reasons we decided to separate users’ information and passwords. We divided it into two tables: user, userInfo.

**LogIn**

|  |  |
| --- | --- |
| **Username** | **Password** |
| dano | password123 |
| naxxo | atanas96 |
| iamstefan | 123456 |

**UserInfo**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Username** | **Name** | **Balance** | **DOB** | **Email** |
| dano | Daniel Hamarik | 125 | 1996-02-12 | daniel.hamarik@gmail.com |
| naxxo | Atanas Latinov | 72 | 1996-05-17 | naxxo.king@gmail.com |
| iamstefan | Stefan Aleksiev | 89 | 1996-09-15 | iamstefanaleksiev@gmail.com |

**Match**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MatchID** | **Team1** | **Team2** | **Coefficient1** | **Coefficient2** | **CoefficientTie** | **Score1** | **Score2** | **Time** | **Type** |
| 101 | Barcelona | Real Madrid | 2.0 | 2.1 | 5.5 | 0 | 3 | 2016-05-12  15:00:00 | Football |
| 105 | Liverpool | Bayern | 1.8 | 2.5 | 6.1 | 2 | 1 | 2016-05-12  16:00:00 | Football |
| 102 | Manchester | Juventus | 1.1 | 3.0 | 8.8 | 0 | 0 | 2016-05-12  19:00:00 | Football |
| 103 | Horsens | Vejle | 1.2 | 2.8 | 4.6 | 4 | 1 | 2016-05-12  15:30:00 | Football |

**Ticket**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TicketNo** | **Username** | **totalOdd** | **Money** | **Status** | **Time** | **MatchID** | **Bet** | **Status** |
| 1 | dano | 4.2 | 10.0 | WIN | 2016-05-12  15:28:15 | 101 | 1 | Win |
| 2 | naxxo | 7.1 | 5.0 | LOSE | 2016-05-12  18:42:38 | 105 | X | Loose |

**Third Normal Form** – all the attributes in a table are determined only by the candidate keys of that table and not by any non-prime attributes

**LogIn**

|  |  |
| --- | --- |
| **UserName** | **Password** |
| dano | password123 |
| naxxo | atanas96 |
| iamstefan | 123456 |

**UserInfo**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Username** | **Name** | **Balance** | **DOB** | **Email** |
| dano | Daniel Hamarik | 125 | 1996-02-12 | daniel.hamarik@gmail.com |
| naxxo | Atanas Latinov | 72 | 1996-05-17 | naxxo.king@gmail.com |
| iamstefan | Stefan Aleksiev | 89 | 1996-09-15 | iamstefanaleksiev@gmail.com |

**Match**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MatchID** | **Team1** | **Team2** | **Coefficient1** | **Coefficient2** | **CoefficientTie** | **Score1** | **Score2** | **Time** | **Type** |
| 101 | Barcelona | Real Madrid | 2.0 | 2.1 | 5.5 | 0 | 3 | 2016-05-12  15:00:00 | Football |
| 105 | Liverpool | Bayern | 1.8 | 2.5 | 6.1 | 2 | 1 | 2016-05-12  16:00:00 | Football |
| 102 | Manchester | Juventus | 1.1 | 3.0 | 8.8 | 0 | 0 | 2016-05-12  19:00:00 | Football |
| 103 | Horsens | Vejle | 1.2 | 2.8 | 4.6 | 4 | 1 | 2016-05-12  15:30:00 | Football |

**TicketInfo**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **TicketNo** | **MatchID** | **Bet** | **Coefficient** | **Status** |
| 1 | 103 | 1 | 1.2 | Win |
| 1 | 105 | 2 | 2.5 | Lose |
| 2 | 101 | X | 5.5 | Lose |
| 2 | 103 | 1 | 1.2 | Win |
| 2 | 105 | 1 | 1.8 | Win |

**Ticket**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **TicketNo** | **Username** | **totalOdd** | **Money** | **Status** | **Time** |
| 1 | dano | 3.0 | 10.0 | Lose | 2016-05-12 15:28:15 |
| 2 | naxxo | 7.1 | 5.0 | Lose | 2016-05-12 18:42:38 |