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