Database Portfolio 3 - 18001399

UNF

When converting the data source into an unnormalized table, first created the column headings, this being a field column followed by the value columns. Once this was completed, the data presented within the scenario, which is presented in a letter form, was entered into the table. The first fields entered into the table are the student information, including the student number, name, address details, as well as their enrolment and registration date.

Field	Value 1	Value 2	Value 3	Value 4
StudentID	58547			
StudentName	Peter Parker			
StudentAddress	34 Derby Way			
StudentCity	Liverpool			
StudentPostcode	L34 5WE			
RegistrationDate	07 November 2013			
EnrolmentDate	04 November 2013			
CurrentlyPaid	£1000			
OutstandingBalance	£4400			
CourseName	Database Technology		Operating Systems	
CourseStartDate	13/01/2014		20/01/2014	
CourseDuration	11 Weeks		6 Weeks	
CourseWeeklySessions	Monday	Wednesday	Monday	Tuesday
CourseWeeklyTime	9:00 AM	11:00 AM	2:00 PM	10:00 AM
CourseLocation	RM201	RM201	LB101	LB211
CourseCost	£3500		£1900	
TutorName	Dr. Julie Henderson		Dr. Peter Williams	
TutorEmail	hendersonh@acetraining.co.uk		williamsp@acetraining.co.uk	
TutorPhoneNumber	0151 233 3325		0151 233 3311	
CompanyName	Ace Training			
CompanyAddress	Liverpool Technology Park			
CompanyCity	Liverpool			
CompanyPostcode	L15 6BE			

The course data is needed to be split across multiple values. There are two courses, which are required to be split across different values, as each has a different start date, duration as well as each having different session times and locations.

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1NF

When converting from UNF to 1NF, repeating attributes need to be identified. Any repeating attributes are removed, and a new table is created, using the same data from UNF, but in a new form. A key then needs to be assigned, and this key is part of the original UNF table, as it is always a part of the key for the new table.

Within the UNF table, various attributes are repeating; in order to convert it into 1NF, these repeating attributes are transferred into multiple tables in order to remove those attributes. Five tables are formed: student, course, tutor, session, and company. Each table contains a primary key that is used to link to another table. By splitting all the attributes into these tables, any repetitions are removed.

Student

Field	Value 1
StudentID	58547
StudentName	Peter Parker
StudentAddress	34 Derby Way
StudentCity	Liverpool
StudentPostcode	L34 5WE
RegistrationDate	07 November 2013
EnrolmentDate	04 November 2013
CurrentlyPaid	£1000
OutstandingBalance	£4400

Course

Field	Value 1	Value 2
StudentID	58547	
TutorID	1	2
CourseName	Database Technology	Operating Systems
CourseStartDate	13/01/2014	20/01/2014
CourseDuration	11 Weeks	6 Weeks
CourseCost	£3500	£1900

Tutor

Field	Value 1	Value 2
TutorID	1	2
CompanyName	Ace Training	Ace Training
TutorName	Dr. Julie Henderson	Dr. Peter Williams
TutorEmail	hendersonh@acetraining.co.uk	williamsp@acetraining.co.uk
TutorPhoneNumber	0151 233 3325	0151 233 3311

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Session

Field	Value 1	Value 2	Value 3	Value 4
CourseName	Database Technology	Database Technology	Operating Systems	Operating Systems
SessionID	1	2	3	4
CourseWeeklySessions	Monday	Wednesday	Monday	Tuesday
CourseWeeklyTime	9:00 AM	11:00 AM	2:00 PM	10:00 AM
CourseLocation	RM201	RM201	LB101	LB211

Company

Field	Value 1
CompanyName	Ace Training
CompanyAddress	Liverpool Technology Park
CompanyCity	Liverpool
CompanyPostcode	L15 6BE

2NF

In 2NF, any attributes that depend only on another part of the table key to a new table, are removed. This is also known as partial dependencies. Any tables that either have no non-key attributes or only one attribute as a key are both already in 2NF.

When converting from 1NF to 2NF, all the key dependencies are checked. This is completed by checking each attribute to see if it is dependent on another attribute. This has led to two new tables being created. The first is 'StudentCourse,' which is created as a student is dependent on course. As well as 'CompanyTutor,' as a tutor, is dependent on the company. In both of these, the dependent attribute is moved to the new table, the other becomes the primary key in the new table and becomes a foreign key in the original table.

Student

Field	Value 1
StudentID	58547
StudentName	Peter Parker
StudentAddress	34 Derby Way
StudentCity	Liverpool
StudentPostcode	L34 5WE
RegistrationDate	07 November 2013
EnrolmentDate	04 November 2013
CurrentlyPaid	£1000
OutstandingBalance	£4400

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StudentCourse

Field	Value 1	Value 2
StudentID	58547	58547
CourseName	Database Technology	Operating Systems

Course

Field	Value 1	Value 2
CourseName	Database Technology	Operating Systems
CourseStartDate	13/01/2014	20/01/2014
CourseDuration	11 Weeks	6 Weeks
CourseCost	£3500	£1900
TutorID	1	2

Tutor

Field	Value 1	Value 2
TutorID	1	2
TutorName	Dr. Julie Henderson	Dr. Peter Williams
TutorEmail	hendersonh@acetraining.co.uk	williamsp@acetraining.co.uk
TutorPhoneNumber	0151 233 3325	0151 233 3311

Session

Field	Value 1	Value 2	Value 3	Value 4
CourseName	Database Technology	Database Technology	Operating Systems	Operating Systems
SessionID	1	2	3	4
CourseWeeklySessions	Monday	Wednesday	Monday	Tuesday
CourseWeeklyTime	9:00 AM	11:00 AM	2:00 PM	10:00 AM
CourseLocation	RM201	RM201	LB101	LB211

CompanyTutor

Field	Value 1	Value 2
CompanyName	Ace Training	Ace Training
TutorID	1	2

Company

Field	Value 1
CompanyName	Ace Training
CompanyAddress	Liverpool Technology Park
CompanyCity	Liverpool
CompanyPostcode	L15 6BE

3NF

When evolving from 2NF to 3NF, any non-key attributes that are dependent on other non-key attributes are removed, rather than the table key. Going through the table, each attribute was compared to see if it is not dependent. All but one part is in 3NF already; this part is the student's finance. These attributes have been split into its own table; the students' ID number is used as a primary key to link the two tables. By completing normalisation, each entity has a unique primary key, and each attribute depends on that primary key. It also ensures no partial dependency and no transitive dependency.

Student

Field	Value 1
StudentID	58547
StudentName	Peter Parker
StudentAddress	34 Derby Way
StudentCity	Liverpool
StudentPostcode	L34 5WE
RegistrationDate	07 November 2013
EnrolmentDate	04 November 2013

StudentFinance

Field	Value 1
StudentID	58547
CurrentlyPaid	£1000
OutstandingBalance	£4400

StudentCourse

Field	Value 1	Value 2
StudentID	58547	58547
CourseName	Database Technology	Operating Systems

Course

Field	Value 1	Value 2
TutorID	1	2
CourseName	Database Technology	Operating Systems
CourseStartDate	13/01/2014	20/01/2014
CourseDuration	11 Weeks	6 Weeks
CourseCost	£3500	£1900

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Tutor

Field	Value 1	Value 2
TutorID	1	2
TutorName	Dr. Julie Henderson	Dr. Peter Williams
TutorEmail	hendersonh@acetraining.co.uk	williamsp@acetraining.co.uk
TutorPhoneNumber	0151 233 3325	0151 233 3311

Session

Field	Value 1	Value 2	Value 3	Value 4
CourseName	Database Technology	Database Technology	Operating Systems	Operating Systems
SessionID	1	2	3	4
CourseWeeklySessions	Monday	Wednesday	Monday	Tuesday
CourseWeeklyTime	9:00 AM	11:00 AM	2:00 PM	10:00 AM
CourseLocation	RM201	RM201	LB101	LB211

CompanyTutor

Field	Value 1	Value 2
CompanyName	Ace Training	Ace Training
TutorID	1	2

Company

Field	Value 1
CompanyName	Ace Training
CompanyAddress	Liverpool Technology Park
CompanyCity	Liverpool
CompanyPostcode	L15 6BE