LIS561 Assignment 5

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- Background

The exercise question is a table with the students and their grades in different topics. All attributes are single valued (1NF). Units (UnitID, StudentID, Date, TutorID, Topic, Room, Grade, Book, TutEmail)

UnitID	StudentID	Date	TutorID	Topic	Room	Grade	Book	TutEmail
U1	St1	23.02.03	Tut1	GMT	629	4.7	Deumlich	tut1@fhbb.ch
U2	St1	18.11.02	Tut3	GIn	631	5.1	Zehnder	tut3@fhbb.ch
U1	St4	23.02.03	Tut1	GMT	629	4.3	Deumlich	tut1@fhbb.ch
U5	St2	05.05.03	Tut3	PhF	632	4.9	Dümmlers	tut3@fhbb.ch
U4	St2	04.07.03	Tut5	AVQ	621	5	SwissTopo	tut5@fhbb.ch

- 1NF -> 2NF

All attributes are single valued (1NF). We firstly convert it into 2NF form. A relation is in second normal form if it is in 1NF and every non key attribute is fully functionally dependent on the primary key.

The **UnitID** and the **StudentID** are the identification keys.

The following functional dependencies exist:

1. The attribute Date, TutorID, Topic, Room, Book are functionally dependent on attribute UnitID (UnitID --> Date, TutorID, Topic, Room, Book)

2. The attribute Grade is fully functional dependent on StudetnID and UnitID (StudetnID, UnitID --> Grade)

2NF FORM:

Unit

UnitID	Date	Topic	Room	Book	TutorID	TutEmail

Grade

UnitID	StudentID	Grade

- 2NF -> 3NF

A relation is in third normal form if it is in 2NF and no non key attribute is transitively dependent on the primary key.

The following dependencies exist:

1. The attribute Date, TutorID, Topic, Room, Book are functionally dependent on attribute UnitID (UnitID --> Date, TutorID, Topic, Room, Book)

2. TutEmail is functionally dependent on TutorID (TutorID --> TutEmail). There is a transitive dependency between TutEmail and TutorID, because TutorID is not the primary key of this relation.

3NF FORM:

Unit

UnitID	Date	Topic	Room	Book	TutorID
U1	23.02.03	GMT	629	Deumlich	Tut1
U1	23.02.03	GMT	629	Deumlich	Tut1
U2	18.11.02	GIn	631	Zehnder	Tut3
U4	04.07.03	AVQ	621	SwissTopo	Tut5
U5	05.05.03	PhF	632	Dümmlers	Tut3

Grade

UnitID	StudentID	Grade
U1	St1	4.7
U2	St1	5.1
U5	St2	4.9
U4	St2	5
U1	St4	4.3

Tutor

TutorID	TutEmail
Tut1	tut1@fhbb.ch
Tut3	tut3@fhbb.ch
Tut5	tut5@fhbb.ch