



CSCC43H: Introduction to Databases

Lecture 12

Wael Aboulsaadat

Acknowledgment: these slides are partially based on Prof. Garcia-Molina & Prof. Ullman slides accompanying the course's textbook.



Database Management System (DBMS)

- A collection of programs that enable:

Defining (describing the structure) DDL

Populating by data (Constructing) DML

Manipulating (querying, updating) DML

Preserving consistency DDL, Normalization

– Protecting from misuse, DDL, (security)

– Recovering from failure, and Transactions

– Concurrent using Transactions

of a database.



REVIEW OF NORMAL FORMS

1NF -> eliminate repeating attributes

1. Identify repeating attributes.
2. All the key attributes are defined.
3. All attributes are dependent on the primary key.

2NF

1. It's in first normal form (1NF)
2. It includes no partial dependencies (where an attribute is dependent on only a part of a primary key).

3NF

1. It's in second normal form (2NF)
2. It contains no transitive dependencies (where a non-key attribute is dependent on another non-key attribute)



Project number	Project name	Employee number	Employee name	Rate category	Hourly rate
1023	Madagascar travel site	11	Vincent Radebe	A	\$60
		12	Pauline James	B	\$50
		16	Charles Ramoraz	C	\$40
1056	Online estate agency	11	Vincent Radebe	A	\$60
		17	Monique Williams	B	\$50



1st NORMAL FORM

Project number	Project name	Employee number	Employee name	Rate category	Hourly rate
1023	Madagascar travel site	11	Vincent Radebe	A	\$60
1023	Madagascar travel site	12	Pauline James	B	\$50
1023	Madagascar travel site	16	Charles Ramoraz	C	\$40
1056	Online estate agency	11	Vincent Radebe	A	\$60
1056	Online estate agency	17	Monique Williams	B	\$50

2nd NORMAL FORM

Employee Table

Employee number	Employee name	Rate category	Hourly rate
11	Vincent Radebe	A	\$60
12	Pauline James	B	\$50
16	Charles Ramoraz	C	\$40
11	Vincent Radebe	A	\$60
17	Monique Williams	B	\$50



2nd NORMAL FORM

Project Table

Employee Project Table

<i>Project number</i>	Project name
1023	Madagascar travel site
1056	Online estate agency

<i>Project number</i>	<i>Employee number</i>
1023	11
1023	12
1023	16
1056	11
1056	17



3rd NORMAL FORM

Employee Table

Employee number	Employee name	Rate category
11	Vincent Radebe	A
12	Pauline James	B
16	Charles Ramoraz	C
11	Vincent Radebe	A
17	Monique Williams	B

Rate

<i>Rate category</i>	Hourly rate
A	\$60
B	\$50
C	\$40



3rd NORMAL FORM

Project Table
Employee Project Table

<i>Project number</i>	Project name
1023	Madagascar travel site
1056	Online estate agency

<i>Project number</i>	<i>Employee number</i>
1023	11
1023	12
1023	16
1056	11
1056	17