**Database Management System – cs422 DE**

**Lab 2 – Week 5**

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**This Lab is based on lecture 5 (chapters 14).**

* Submit your *own work* on time. No credit will be given if the lab is submitted after the due date.
* Note that the completed lab should be submitted in .doc, .docx, .rtf or .pdf format only.
* If you think that your answer needs more explanation to get credit then please write it down.   
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Consider a relation with following attributes:

EmpNo : Employee Number

EmpName : Employee Name

EmpEmail : Employee Email

ProjNo : Project Number

ProjName : Project Name

EmpGrade : Employee Grade

HrlyRate : Hourly rate of compensation

Employees of the same grade receive the same hourly compensation

HrsWorked : Hours a particular employee worked on a particular project

1. Create this table and sample data in SQL Server. There must be at least 10 rows. There must be 3 to 6 Employees and 3 to 6 projects. You need to add the screenshot of the table showing all the rows.

A screenshot of a computer

Description automatically generated with medium confidence

1. Find all functional dependencies.  
   ANS:

EmpNo->EmpName, EmpEmail, EmpGrade, HrlRate

EmpEmail->EmpName, EmpNo, EmpGrade, HrlRate

ProjNo-> ProjName

(EmpNo, ProjNo)-> HrsWorked

(EmpEmail, ProjNo)->HrsWorked

1. Find all Candidate Keys.  
   ANS:

(EmpNo, ProjectNo)

(EmpEmail, ProjectNo)

1. Find a Primary Key.  
   ANS:

(EmpNo, ProjectNo)

1. Find all partial dependencies.  
   ANS:

EmpNo-> EmpName,EmpEmail, EmpGrade, HrlyRate

EmpEmail-> EmpName, EmpNo, EmpGrade, HrlyRate

ProjNo-> ProjName

1. Normalize to 2NF.  
   ANS:

Employee:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| EmpNo | EmpName | EmpEmail | EmpGrade | HrlyRate |

Project:

|  |  |
| --- | --- |
| ProjNo | ProjName |

Employee\_Project

|  |  |  |
| --- | --- | --- |
| EmpNO | ProjNo | HrsWorked |

1. Show new tables after 2NF (based on the sample data you created in 1 above). Screenshots of all the tables are required.

Employee:

Table

Description automatically generated

Project:

Graphical user interface, application

Description automatically generated

Employee\_Project:

Table

Description automatically generated

1. Normalize to 3NF.  
   ANS:

To convert 3NF there shouldn’t be transitive dependency. There is one transitive dependency i.e.

EmpGrade->HrlyRate

For this we must create a new table Grade with these two attributes and keep one attribute EmpGrade of this Grade table to Employee table.

Grade:

|  |  |
| --- | --- |
| EmpGrade | HrlyRate |

Employee:

|  |  |  |  |
| --- | --- | --- | --- |
| EmpNo | EmpName | EmpEmail | EmpGrade |

Project:

|  |  |
| --- | --- |
| ProjNo | ProjName |

Employee\_Project:

|  |  |  |
| --- | --- | --- |
| EmpNo | ProjNo | HrsWorked |

1. Show new tables after 3NF (based on the sample data you created in 1 above). Screenshots of all the tables are required.

Ans:

Grade:

Table

Description automatically generated

Employee:

Graphical user interface

Description automatically generated

Project:

Graphical user interface, application

Description automatically generated

Employee\_Project:

Table

Description automatically generated