**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

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1. Find all functional dependencies.  
   ANS:
   * (EmpNo) -> EmpName, EmpEmail, EmpGrade, HrlyRate
   * (ProjNo) -> ProjName
   * (EmpGrade) -> HrlyRate
   * (EmpNo, ProjNo) -> HrsWorked
2. Find all Candidate Keys.  
   ANS:
   * (EmpNo, ProjNo) -> uniquely identify all other attributes.
3. Find a Primary Key.  
   ANS:
   * (EmpNo, ProjNo)
4. Find all partial dependencies.  
   ANS:
   * (EmpNo) -> EmpName, EmpEmail, EmpGrade, HrlyRate
   * (ProjNo) -> ProjName
5. Normalize to 2NF.  
   ANS: Eliminate partial dependencies.
   * Employee (EmpNo, EmpName, EmpEmail, EmpGrade, HrlyRate)
   * Project (ProjNo, ProjName)
   * EmployeeProject (EmpNo, ProjNo, HrsWorked)
6. Show new tables after 2NF (based on the sample data you created in 1 above). Screenshots of all the tables are required.

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1. Normalize to 3NF.  
   ANS: Eliminate transitive dependency: (EmpGrade) -> HrlyRate
   * Employee (EmpNo, EmpName, EmpEmail, EmpGrade)
   * EmpCompensation (EmpGrade, HrlyRate)
   * Project (ProjNo, ProjName)
   * EmployeeProject (EmpNo, ProjNo, HrsWorked)
2. Show new tables after 3NF (based on the sample data you created in 1 above). Screenshots of all the tables are required.

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