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Assignment 1
Due Date: 9/26/2017

Problem 1

Project Code	Project Title	Project Manager	Project Budget	Employee No.	Employee Name	Dept No.	Dept Name	Hourly Rate

Solution:

Employee No.	Employee Name	Project Code	Project Title	Project Manager	Project Budget	Dept No.	Dept Name	Hourly Rate

1NF

Employee No. -> Employee Name
Employee No. -> Dept No.
Employee No. -> Dept Name
Employee No. -> Hourly Rate
Employee No. -> Project Code
Employee No. -> Project Title
Employee No. -> Project Manager
Employee No. -> Project Budget

Employee No. is the Primary Key and is a key to all the other attributes. The table above is in 1NF.

2NF

Employee No.	Employee Name	Dept No.	Dept Name	Employee Table
Project Code	Project Title	Project Manager	Project Budget	Project Table
Employee No.	Project Code	Hourly Rate		Assignment Table

Project Code -> Project Title
Project Code -> Project Manager
Project Code -> Project Budget
Project Code -> Employee No.
Project Code -> Employee Name
Project Code -> Hourly Rate

partial dependency

** According to the table presented on the homework, each Project and Budget is exclusive to the Project Manager and the Project that they're in charge of. No one manager is working on multiple projects according to the table. So the assumptions are as follows:

Assumptions: * no manager has more than 1 project at a time.
* each project only has 1 manager.

The last 3 relations identify partial dependency because they can be linked to the primary key - Employee No. To elimiate partial dependency, Project related items (Project Code, Project Title, Project Manager, and Project Budget) become a table of its own with Project Code being the primary key for that table. This becomes the Project Table. Now that we have Employee Table and Project Table, we will elminate the second form of partial dependency of the Project Code and Hourly Rate by creating a composite key, Employee No. and Project Code to get Hourly Rate, which creates Assignment Table.

Above 3 Tables are in 2NF.

To obtain 3NF, we need to remove transitive dependency. By making Department No. and Department Name into its own table - Department Table, we achieve 3NF.

3NF

Employee No.	Employee Name	Dept No.		Employee Table
Project Code	Project Title	Project Manager	Project Budget	Project Table
Employee No.	Project Code	Hourly Rate		Assignment Table
Dept No.	Dept Name			Department Table

Problem 2 Repayment(Borrower_ID, Name, Address, loanamount, requestdate, repayment_date, repayment_amount)

Solution:

Borrower_ID	Name	Address	loanamount	requestdate	repayment_date	repayment_amount

1NF

Borrower_ID	Name	Address	
Borrower_ID	requestdate	loanamount	
requestdate	loanamount	repayment_date	repayment_amount

3NF

** assuming the borrower_ID is unique, like the borrower's SSN.
** assuming that a single borrower can have multiple request dates.

Under these assumptions, the composite key of Borrower_ID and requestdate make a unique super key that functions as type of "loan ID," if you will. This will allow the user to look up the loan amount, repayment_date, and the repayment_amount.

Problem 3

Author(AuthorFName, AuthorLName, Author_ID, Birthdate)
Publishers(PublisherName, Publisher_ID, Address)
Books(ISBN, Title, Publisher_ID)

** assuming all book titles are unique
** assuming all publishers have unique names