



Computer Sciences Department
CS 3810 - Principles of Database Systems – Spring 2022

Homework 06

Deadline: **March 10 (12pm)**

Below is a table named “Projects” that lists the number of hours some of the employees of a fictitious company put into different projects. Note that in this company a project can only have one designated project type.

SSN	Employee's Name	Project	Project's Type	Number of Hours
666666666	Morbid Mojito	1-“Spooky Wedding”	6-Event	32.5
		7-“Horror Hall”	2-Construction	150
123456789	Sam Mai Tai	3-“Mai Tai Bar”	2-Construction	180
888777666	James Brandy	2-“Droid”	3-Software	37
		5-“Run4Life App”	3-Software	21.5
		6-“Stop, Breath, & Think”	9-Research	999.99

a) Normalize the table to 1NF.

Split Project into prjId and prjDescr

Split Project's Type into prjTypeId and prjTypeDescr

b) Normalize to 2NF.

Key is { SSN, prjId }

List all functional dependencies that are considered violations of the 2NF:

SSN -> empName

prjId -> prjDescr, prjTypeId, prjTypeDescr

Relational schema after normalization to 2NF:

Employees(ssn*, empName)

Projects(prjId*, prjDescr, prjTypeId, prjTypeDescr)

EmployeeProjects(ssn*, prjId*, hours)

c) Normalize to 3NF.

List all functional dependencies that are considered violations of the 3NF:

`prjTypeId -> prjTypeDescr`

Relational schema after normalization to 3NF:

`ProjectTypes (prjTypeId*, prjTypeDescr)`
`Employees (ssn*, empName)`
`Projects (prjId*, prjDescr, prjTypeId)`
`EmployeeProjects (ssn*, prjId*, hours)`