

## Assignment 2: Normalization

Consider the following table of data for a workplace. All necessary information about the problem can be derived from the data itself; you can assume there are no weird tricks like two different managers with the same name or anything like that.

Emp. ID	Employee Name	Email	Department	Job Type	Hourly Rate	Manager	Projects
101	Alice Smith	alice@email.com	HR	Recruiter	25	Bob Miller	Employee Training, Hiring
102	Bob Miller	bob@email.com	HR	Manager	40	(None)	HR Strategy
103	Charlie Green	charlie@email.com	IT	Developer	35	David Lee	Software Development, Maintenance
104	Garth White	garth@email.com	IT	Developer	35	David Lee	Software Development, Testing
105	Eric Johnson	eric@email.com	IT	Tester	30	David Lee	Testing
106	Fiona Adams	fiona@email.com	Sales	Sales Rep	28	George King	Customer Outreach, Sales Reports

As you work, I recommend building tables to see what the relations look like in practice. It may take some trial and error to find the right keys, determinants, etc. You can either work in Word or Excel (or similar program); save your work as a file called **a2-firstname-lastname** in **xlsx** or **docx** format.

### Task 1

- [1mark] Convert this data into **first normal form**.
- [1 mark] Write the relation/s as a single line using the notation from the slides and textbook.

### Task 2

- [1 mark] Figure out which columns can be combined to form a **minimal composite/concatenated key**. Explain your reasoning for choosing this key.
- [1 mark] Convert the data to **second normal form** and write the **relations** with their **keys**. Remember that within each relation, each attribute should be functionally determined by the entire key, not just part of it. For each new relation, briefly explain your reasoning. Optionally, you can create the tables but it's not required.

### Task 3

- [1 mark] Convert the data to **third normal form** and write the **relations** with their **keys**. Remember that there should be no transitive dependencies, which means each attribute should depend on the key directly and not on some other attribute that is itself directly dependent on the key. For each new relation, briefly explain your reasoning.
- [1 mark] Build the tables for each relation with all data from the initial table.

## **Hand In**

Zip your file and hand it in to the appropriate folder on Brightspace.

As usual, up to -25% could be deducted for improper hand in, disorganized files, etc.  
Ask me if in doubt.