Middle East Technical University

Department of Computer Engineering

**CENG 351**

Data Management & File Structures

Fall 2021–2022

In Class Activity 1 — ER Modeling

# 1 Task

You have decided to present your own product to the Ministry of Health due to the problems you have observed on the vaccination system of the e-Nabız application. In order to conceptualize your product, you will draw an *ER Diagram* and give the *list of relations*. Make sure to include **bold** entities and *italic* attributes listed in the requirements below while drawing your diagram.

# 2 Requirements

In the proposed vaccination system, a user will be able to have vaccination and get PCR tests from medical facilities. In your business logic, each **user** has unique *T.C. Kimlik number*. Users should also have *name*, *e-mail* and *password* information.

**Medical Facilities** include **hospitals** and **health clinics**. *Name*, *address* and unique *facility ID* information of medical facilities should be stored. Besides, the *bed capacity* of hospitals should also be recorded. For health clinics, *clinic type* information is required. Hospitals are divided into two groups as **vaccine-appropriate hospitals** and **pandemic-free hospitals**. **Vaccination rooms** are part of vaccine-appropriate hospitals. *Room numbers* are unique only within a vaccine-appropriate hospitals. Furthermore, the *floor numbers* are stored for vaccination rooms. There should be at least one vaccination room in a vaccine-appropriate hospital, but a vaccination room must belong to one vaccine-appropriate hospital. Pandemic free hospitals and health clinics do not have any vaccination room.

**Vaccines** have *names*, *types* (e.g. mRNA, viral vector), *disease* (e.g. COVID-19, SARS), in which the vaccine is effective, and unique *codes*. A vaccine is applied to a user at a particular room of a hospital. Obviously, a vaccine can be used in at most one vaccination; but users can be vaccinated many times, and a hospital's vaccination room can be used for many vaccinations. For each vaccination, it is necessary to record the *dose* and the *date* that the user has vaccinated.

Each **AllergicSideEffect** has a *name* and a unique *code*. After a vaccination some AllergicSideEffects can be seen, and a particular AllergicSideEffect can be seen after some vaccinations. For each AllergicSideEffect seen, we should store *date* and *degree*.

**PCR tests** are distinguished by *unique IDs*. Additionally, *time* and *result* are also recorded for each PCR test. Although it is possible for a user to have more than one PCR test, a PCR test must belong to exactly one user.

# 3 What to Deliver

Draw the ER diagram of the scenario above and give the list of relations. Make sure to show primary key of each relation, any foreign keys, key and participation constraints. You will be graded according to correct use of ER modeling constructs inline with the given requirements.

Upload your ER diagram and the list of relations as a PDF file or files to the In Class Activity 1 - Submission assignment module in ODTUClass.