

# CECS 323 HOMEWORK: PATIENTS AND BLOOD SAMPLES

**OBJECTIVE:** Do some design work using one to many relationships.

**INTRODUCTION:** Design a database to store blood tests. Each patient will have many blood samples drawn. For a given patient, we tell one sample from another by the date and time when the patient gave that sample. The lab can test a given blood sample for several possible substances. **Examples** would be: Sodium, Cholesterol (both LDL and HDL), blood sugar, blood alcohol, and so forth. The list of possible substances is large and changes frequently.

For each test for each sample we will capture the measured amount. For instance, John Peterson might come in on July 22<sup>nd</sup> of 2019 to give us a blood sample, and we check that sample for his Coumadin level, blood sugar, and LDL cholesterol. Then he comes back again on July 29<sup>th</sup> of 2019 to give us another sample and we check **that** sample for his Sodium levels and Prostate-specific antigen (PSA).

We will never measure the same substance more than once for any given blood sample.

Please be sure that you can store the following:

- Patient's name
- Patient's e-mail address
- Sample date
- Sample time
- Sample size (in milliliters)
- Substance tested for
- Amount of substance found in the blood (in milligrams/milliliter)

**PROCEDURE:** Develop a model for this data.

**WHAT TO TURN IN:**

- The class model.
- The definitions for your classes. Please put this into a separate Word document or text file.
- The relation scheme diagram.
  - In your relation scheme diagram, be sure to indicate the primary key **for each relation**.
  - Explain your choice for the primary key.
  - If you can identify any additional candidate keys, please show them in the diagram.
- Write the SQL that will list the patient name, time and date of any blood samples that show a value of LDL cholesterol > 160 mg/mL (mL stands for milliliter).
- Write the same query using Relational Algebra.
- Your team's filled out collaboration document. You can find a template for that [here](#).