

Code Exercise:

Doctors often request bloodwork on their patients to aid in diagnosing or reviewing efficacy of treatment.

The laboratory will send a nurse (phlebotomist) to draw the blood and take the sample(s) to the laboratory for testing.

The laboratory performs tests on the samples and generates a report on their findings.

This report is sent back to the doctor.

You need to write a basic application that helps the lab capture the patient demographics and test-results and generate a report as either a JSON or human-readable text file.

Write a single application – we're not focusing on different layers at the moment. You can choose between which presentation-layer technology you are comfortable with (e.g., Winforms, WPF or Blazor);

The application should allow the user to register requisition objects (see Appendix A for general information on the data objects that you'll need to create).

It should also allow the user to enter results for the requested tests.

Finally, it should allow the user to choose between two forms of reporting and a directory location for the file:

- JSON
 - Create a JSON file of the requisition object.
- Text File
 - Create a text report that provides the captured information in a user-friendly way. (I leave the design up to you).

NOTE: Although this is a simple program – please try to adhere to the best coding practices as you understand them. We will be looking at UI design, understanding of objects and general structure, user-interaction and considerations for future expansions (e.g., expanding the list of available tests or type of reporting).

Even if you cannot do everything – try your best to get where you can.

Appendix A: Data Object

Test

When registering the patient, the user must choose one-or-more from a list of available tests.

These tests must be prepopulated (see Data below) and made available to the user.

Object Definition

Field	Type	Validation
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TestId	Int	None
Mnemonic	String	None
Description	String	None
IsActive	Bool	None

Data

Create a text file that your system reads from on startup to prepopulate the list of available tests.

TestId	Mnemonic	Description	IsActive
1	Na	Sodium	True
2	K	Potassium	True
3	Cr	Creatinine	True
4	Ucr	Urine-Creatinine	False
5	Ur	Urea	True
6	UCE	Urea+Creatinine+Electrolytes	True

Request

Having picked from the list of available tests – the lab must have a place where they can enter the results for the tests. This object captures those results and is unique per request-form.

Object Definition

Field	Type	Validation
TestId	Int	None
Result	String	None
Comment	String	None

Requisition

A doctor can request multiple tests to be performed against a patient.

The requisition represents the general request made by the doctor and holds the patient demographics along with the tests requested and their results:

Object Definition

Field	Type	Validation
RequisitionId	String	Only allow numerical values between: 0001 and 9999
TimeSampleTaken	DateTime	None
FirstName	String	None
Surname	String	None
Gender	String	Only allow the following characters:

		M F U
DateOfBirth	Date	Can't be after the TimeSampleTaken
Age	Integer	Read-only field calculated from TimeSampleTaken and DateOfBirth
MobileNumber	String	Only allow cellphone numbers. Show the user that we limit to South African numbers by adding "+27".
RequestedTests	List<Request>	<p>Certain tests may not be requested on the same requisition: Tests 1, 2 3, 5 may not be requested along with Test 6.</p> <p>The user may not request inactive tests.</p>