Prerequisites for the exercises

* Read and understand the basics in OPC UA and try out how a simple OPC UA Client Server communication works
* Go through documentations of open62541 to know how to build and run a basic client server communication
  1. <https://open62541.org/doc/current/building.html> (stack build)
  2. <https://open62541.org/doc/current/tutorial_server_firststeps.html> (OPC UA Server)
  3. <https://open62541.org/doc/current/tutorial_client_firststeps.html> (OPC UA Client)

Exercise 1

**Objective**:

Using the available open62541 examples in github, create multiple nodes in the address space of the server as mentioned below

**Procedure**:

1. Download the open62541 SDK available in github
   1. <https://github.com/open62541/open62541>
2. Now, create your own OPC UA server (referring to the examples) with the below mentioned nodes created in the server’s address space.
   1. Object node (Folder Type)
      1. Name: “Variable Collections”
   2. Variable Node
      1. Name: “My Variable 1”
      2. Type: Int32
      3. Value: 334
   3. Variable Node
      1. Name: “My Variable 2”
      2. Type: Int64
      3. Value: 12321
   4. Variable Node
      1. Name: “My Variable 3”
      2. Type: String
      3. Value: “Temporary string”
   5. Variable node (Array of size 10)
      1. Name: “My Array variable 1”
      2. Type: Int32
      3. Array length: 10
      4. Value: { 10, 11, 23, 54, 55, 1353, 434, 65, 6, 9 }
3. After developing the OPC UA Server code, build the file and run it.
4. To validate the file, use the OPC UA GUI client to see the servers address space
   1. <https://github.com/FreeOpcUa/opcua-client-gui>

**Result:**

1. Your code should contain necessary comments for the functions and variables
2. You can use any OS, any IDE and any compiler to program
3. Finally commit your full code package on github and share us the link

Exercise 2

**Objective**:

Read the data from the OPC UA server every one second and store the data inside the database

Store the data in the database

Receive the data from the server

Send request for data

OPC UA Client

DB

OPC UA Server

**Procedure:**

**At Database-**

1. Create new database
2. Create a new table named “OPC UA Data table”
3. Create a schema for the table

**At server-**

1. Create a variable of name “Temperature” and type Int32 in OPC UA server
2. Create a function which updates the temperature value every 2 seconds

**At Client-**

1. Create a client code which initially connects to the server with the given ip address
2. Now create a connection with the database with its username and password
3. Then request for the value of Temperature every 2 seconds
4. After receiving the temperature value store the temperature value in the database

**Result:**

1. Your code should contain necessary comments for the functions and variables
2. You can use any OS, any IDE and any compiler to program
3. Finally commit your full code package on github and share us the link