MECHENG 709/710 - Assignment (2024)

The main aim of this part of the assignment is to help you understand some of the basic elements in a set of OPC UA Python codes, including address space and namespace that make up an important part of an OPC UA information model.

**Practice questions (not marked)**

To answer the following three questions, you have to study, understand and run the given example server and client codes in the “e*xample codes”* folder (*example\_server.py & example\_client.py).* They can be found on Canvas. Assume you initialise the server before starting the client.

1. What is the endpoint URL for the server, and what is the endpoint URL for the client?

2. What is the root node ID for the server?

3. What are the browse names, default values, and node IDs for the following two assigned variables?

|  |  |  |  |
| --- | --- | --- | --- |
| **Python Variables** | **Browse name** | **Default value** | **Node ID** |
| Sensor\_name |  |  |  |
| Temperature |  |  |  |

**Questions related to the assignment codes (4 marks)**

These questions are based on codes, *Company1\_Client.py* and *Company2\_Client.py.*

1. Below is a collation of the device tags, browse names and NodeID extracted from OPC UA server under Node Class or Node Class variable. Fill the vacant cells in the table. (2 marks)

If needed, consult *[section 2.2 Nodes and References Book of OPC Unified Architecture]*

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Variable Name**  **(client 1)** | **Browse Name** | **Node ID** |
| **1** | Equipment\_ID1 | Equipment\_ID | ns=2;i=2 |
| **2** | Equipment\_ID2 | Equipment\_ID | ns=2;i=3 |
| **3** | Equipment\_ID3 | Equipment\_ID | ns=2;i=4 |
| **4** | time\_left\_conveyor |  | ns=2;i=5" |
| **5** | time\_left\_kuka |  | ns=2;i=6 |
| **6** | time\_left\_Lathe |  | ns=2;i=7 |
| **7** | message |  | ns=2;i=8 |
| **8** | current\_time |  | ns=2;i=9 |
| **9** | Kuka\_operation |  | ns=2;i=10 |
| **10** | Lathe\_operation |  | ns=2;i=11 |
| **11** | WorkpieceID |  | ns=2;i=12 |
| **12** | Conveyor\_Status |  | ns=2;i=13 |
| **13** | Kuka\_Status |  | ns=2;i=14 |
| **14** | Lathe\_Status |  | ns=2;i=15" |

2. Fill the vacant cells in the table below based on client codes 1 & 2. Below is a collation of the callable method names, browse names and NodeID extracted from OPC UA server under Node Class object. (Some details may not be applicable) (2 marks)

If needed, consult *[section 2.2 Nodes and References Book of OPC Unified Architecture]*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **No.** | **Callable Methods (both clients)** | **Browse Name** | **Node ID** | **Function Name** | **Argument** |
| **1** | Start\_Conveyor\_prog | Conveyor | ns=1;i=2001 | Start\_Conveyor\_prog | Current\_operation |
| **2** | Start\_Lathe\_Prog1 |  |  |  | Null |
| **3** | Start\_Lathe\_Prog2 |  |  |  | Null |
| **4** | Start\_Kuka\_Prog1 |  |  |  | Null |
| **5** | Start\_Kuka\_Prog2 |  |  |  | Null |