

aUToronto Coding Baseline Question:

In aUToronto's autonomy system, we utilize ROS2 Humble as our middleware for different function software to communicate with each other. So while we understand that you might not have used ROS2 before, this question also aims to see your capability to learn on the fly, which is a very important aspect work with aUToronto.

You will be given two ROS topics to subscribe to:

- A ROS2 Topic: `"/input"`
 - Type: [std_msgs/Int8MultiArray](#)
 - Content: an array of integers
- A ROS2 Topic: `"/target"`
 - Type: [std_msgs/Int8](#)
 - Content: an integer target

From the array of integers in the ROS2 Topic `"/input"` and an integer `"/target"`, publish the indices of the two numbers in the array of integer in `"/input"` such that they add up to the integer in `"/target"`. You may assume that each input would have exactly only one solution, and you may not use the same element twice. You can return the answer in any order. The topic `"/input"` and `"/target"` will always have the same value and be published at a 1Hz rate.

Your submission specification:

- Your node should be compilable and runnable without any external dependency
 - Please submit your full node package in the correct folder structure (i.e. should include `CMakeLists.txt` and `package.xml`)
- Your package name should be `autoronto_interview`, and the node name should be `solution`
- Your node will publish a ROS2 Topic: `"/solution"` at 1Hz rate.
 - Type: [std_msgs/Int8MultiArray](#)
 - Content: indices of the two numbers that will add to the target value from the input array.
- Your system will be evaluated by our automated system by running the equivalent of:
 - `ros2 run autoronto_interview solution`

Hints:

1. You will need to have an Ubuntu 22.04 environment for this coding question. Alternatively you can use Docker or WSL for development.
2. For information about installing ROS2 Humble, you can refer to here: <https://docs.ros.org/en/humble/Installation.html> (Note Ubuntu 22.04 is recommended.)
3. You can find a sample of how to compose a ROS2 node, with publisher and subscriber here: <https://docs.ros.org/en/humble/Tutorials/Writing-A-Simple-Cpp-Publisher-And-Subscriber.html>
4. You are allowed to use any resource available to you, including Google, Stack Overflow, etc. Your goal is to get a working ROS2 node back to us.