Objective

Create a ros2 package with a node for video conversion in ros2
NOTE: You can use either Python or C++ for the task.

Details

1. Install ros2 usb_cam package - LINK - it publishes the images from usb/laptop camera on ros2 topic.
   NOTE: If you cannot download/install the usb_cam package, check the 'troubleshooting' section at the end.
2. Then create a ros2 package that has the following:

image_conversion Node:

1. The *image_conversion* node should Subscribe to the image topic (colored image) published by usb_cam package.
2. The *image_conversion* node continuously publishes the output image to an output ROS2 topic. You can decide the name of the output ROS2 topic.
3. The *image_conversion* node hosts (server) a ros2 service (bool), to change its mode -
   a. Mode 1: Greyscale
   b. Mode 2: Color
4. The image_conversion node should let the user change its mode through the above service call.
5. Based on the mode, the image_conversion node should convert the RGB/BGR input image to grayscale (mode 1) or not convert it (mode 2).
6. *image_conversion* node should then continuously publish the final image as the output image on the output ROS2 topic.

Launch file

7. Provide a launch file that launches
   a. the image_conversion node,
   b. as well as usb_cam node, that publishes on the images from camera on a ros2 topic.
8. Parameters to change the input camera topic and output image topic

Troubleshoot

Unable to download/install the usb_cam package

1. Create a dummy_usb_cam package.
2. This package should read an image/video from the local disk and publish it (the exact image/video) at 30Hz, continuously. This way it can mock the usb_cam package.
3. The topic name should be ‘/image_raw’
4. NOTE: We are not judging your ability to install the usb_cam package or read images from the camera. The main output of the task is
    a. Launch file
    b. Image_conversion node