📌 Setting Up the ROS 2 Workspace and Building the Project

Two options are provided:

> **Page: 1** - Guides you to setup the project on your **local machine**
>
> **Page. 2** - Guides you to setup the project using a provided **devcontainer**

This guide walks you through:
✅ Creating a **ROS 2 workspace**
✅ Cloning the **project repository**
✅ Installing dependencies
✅ Building the project using `colcon build --symlink-install`

1️⃣ Prerequisites

Before starting, ensure you have:
✔ **ROS 2 Jazzy installed** (Installation Guide)
✔ **Colcon build tools** installed:

sudo apt install python3-colcon-common-extensions

✔ **Gazebo Sim (gz-sim)** installed:

sudo apt install ros-jazzy-gz-sim

2️⃣ Create a New ROS 2 Workspace

A ROS 2 workspace is needed to organize the project's packages.

```
# Create workspace directory
mkdir -p ~/colcon_ws/src

# Navigate into the workspace
cd ~/colcon_ws
```

✅ **Why?**

- This workspace (`colcon_ws`) will contain all the packages.
- The `src/` folder is where ROS 2 packages will be stored.

3️⃣ Clone the Project Repository

To download the project, run:

cd ~/colcon_ws/src

Clone the repository (Replace with actual repo URL)
git clone https://github.com/your-org/your-repo.git

4️⃣ Install Dependencies

Navigate back to the workspace root:

cd ~/colcon_ws

Install the required dependencies:

rosdep update
rosdep install --from-paths src --ignore-src -r -y

5️⃣ Build the Project

Run:

colcon build --symlink-install

6️⃣ Source the Workspace

Before running any ROS 2 commands, source the workspace:

source ~/colcon_ws/install/setup.bash

7️⃣ Run the Full System

Launch the robot in Gazebo

ros2 launch case_gz robot_control.launch.py

Start MoveIt

ros2 launch case_moveit_config demo.launch.py

Run the operational logic

ros2 run case_task robot_logic

Launch Everything Together

ros2 launch case_bringup bringup.launch.py

📌 Troubleshooting

Issue	Solution
`command not found: colcon`	Run `sudo apt install python3-colcon-common-extensions`
`package not found` error	Run `rosdep install --from-paths src --ignore-src -r -y`
`ros2: command not found`	Ensure ROS 2 is sourced: `source /opt/ros/jazzy/setup.bash`
Gazebo not launching	Check installation: `sudo apt install ros-jazzy-gz-sim`

🚀 Summary

✔ **Created a ROS 2 workspace** (`colcon_ws`)
✔ **Cloned the repository**
✔ **Installed dependencies with `rosdep`**
✔ **Built the project with `colcon build --symlink-install`**
✔ **Sourced the workspace and ran the system**