Installing URSim on Windows 10

Follow these steps to get URSim running via Docker on Windows 10 probably also works for Windows 11 but I haven't tested it.

1. Install Docker Desktop

- **Download and Install:**
  Visit the Docker Desktop download page and install it.
- **Prerequisites:**
  - Ensure virtualization is enabled in your BIOS.
  - If you're on Windows 10 Home, set up WSL2 as Docker Desktop requires it.
  - Confirm that Docker is set up to use Linux containers (default setup).

2. Prepare an X Server for the GUI

URSim has a GUI, and Docker containers on Windows don't natively display GUIs. You'll need an X server to forward the display.

- **Recommended X Server:**
  VcXsrv download link
- **Install and Configure:**
  After installing VcXsrv, launch it and allow network connections so that the container can forward its GUI to your Windows desktop.

3. Pull the URSim Image

Open PowerShell or Command Prompt and run:

```
docker pull universalrobots/ursim_e-series
```

This command downloads the URSim simulator image.

4. Start Docker Desktop

Run `docker desktop start` in powershell.

```
docker desktop start
```

5. Start docker dekstop and run the URSim Container with GUI Forwarding

Since Windows doesn't support Linux's `--net=host`, you need to manually map the display. Assuming VcXsrv is set to listen on display 0, run:

```
& "$env:ProgramFiles\VcXsrv\vcxsrv.exe" :0 -multiwindow -clipboard -wgl -ac # Runs
# X server
docker desktop start; # Starts docker desktop
docker run --rm `
  -e DISPLAY=host.docker.internal:0 `
  -p 30001-30004:30001-30004 `
  -p 29999:29999 `
  universalrobots/ursim_e-series # Runs UR Sim and opens ports for UR RTDE
```

This command tells the container where to send its GUI.

6. Troubleshooting

- **No GUI Display?**
  - Make sure VcXsrv is running and accepting connections. If not, open **XLaunch**.
  - Check that your firewall isn't blocking the connection.
  - Verify that the display number (`0`) matches your VcXsrv configuration.
- **Port Mapping Issues?**
  The container might require additional port mappings depending on how URSim is set up. You can use `-p hostPort:containerPort` to forward ports if needed.

Follow these steps, and you should have URSim up and running on Windows 10!