

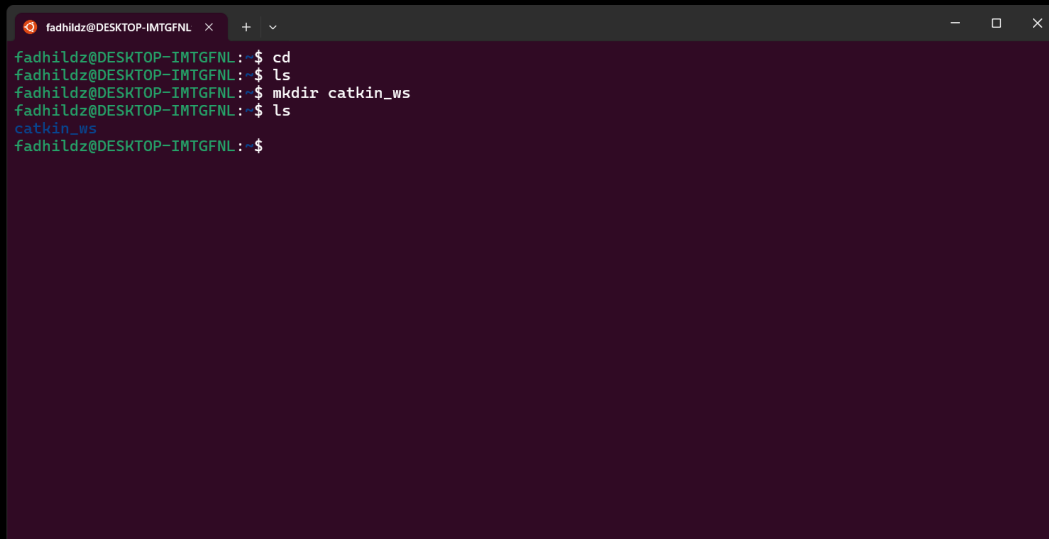
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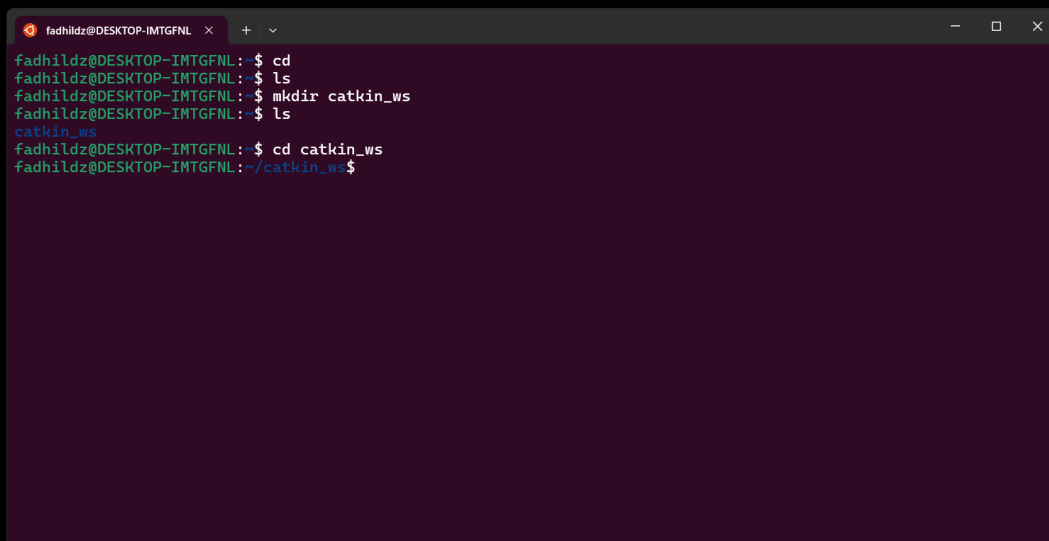
Langkah-langkah Ros Tutorial 3 (ROS1) [Create and Setup a Catkin Workspace](#)

1. **mkdir catkin_ws** untuk membuat direktori workspace baru yang akan digunakan sebagai tempat kerja proyek ROS.



```
fadhildz@DESKTOP-IMTGFNL: ~$ cd
fadhildz@DESKTOP-IMTGFNL: ~$ ls
fadhildz@DESKTOP-IMTGFNL: ~$ mkdir catkin_ws
fadhildz@DESKTOP-IMTGFNL: ~$ ls
catkin_ws
fadhildz@DESKTOP-IMTGFNL: ~$
```

2. **cd catkin_ws** untuk berpindah ke direktori workspace yang baru saja dibuat.



```
fadhildz@DESKTOP-IMTGFNL: ~$ cd
fadhildz@DESKTOP-IMTGFNL: ~$ ls
fadhildz@DESKTOP-IMTGFNL: ~$ mkdir catkin_ws
fadhildz@DESKTOP-IMTGFNL: ~$ ls
catkin_ws
fadhildz@DESKTOP-IMTGFNL: ~$ cd catkin_ws
fadhildz@DESKTOP-IMTGFNL: ~/catkin_ws$
```

3. **mkdir src** untuk untuk membuat direktori src di dalam workspace.

```
fadhildz@DESKTOP-IMTGFNL:~$ cd
fadhildz@DESKTOP-IMTGFNL:~$ ls
fadhildz@DESKTOP-IMTGFNL:~$ mkdir catkin_ws
fadhildz@DESKTOP-IMTGFNL:~$ ls
catkin_ws
fadhildz@DESKTOP-IMTGFNL:~$ cd catkin_ws
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$ ls
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$ mkdir src
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$ ls
src
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$
```

4. **catkin_make** untuk menginisialisasi Catkin Workspace dengan membangun struktur dasar proyek yang akan menghasilkan direktori build/ dan devel/ di dalam workspace.

```
fadhildz@DESKTOP-IMTGFNL:~$ cd
fadhildz@DESKTOP-IMTGFNL:~$ ls
fadhildz@DESKTOP-IMTGFNL:~$ mkdir catkin_ws
fadhildz@DESKTOP-IMTGFNL:~$ ls
catkin_ws
fadhildz@DESKTOP-IMTGFNL:~$ cd catkin_ws
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$ ls
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$ mkdir src
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$ ls
src
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$ catkin_make
Base path: /home/fadhildz/catkin_ws
Source space: /home/fadhildz/catkin_ws/src
Build space: /home/fadhildz/catkin_ws/build
Devel space: /home/fadhildz/catkin_ws/devel
Install space: /home/fadhildz/catkin_ws/install
Creating symlink "/home/fadhildz/catkin_ws/src/CMakeLists.txt" pointing to "/opt/ros/noetic/share/catkin/cmake/toplevel.cmake"
####
#### Running command: "cmake /home/fadhildz/catkin_ws/src -DCATKIN_DEVEL_PREFIX=/home/fadhildz/catkin_ws/devel -DCMAKE_INSTALL_PREFIX=/home/fadhildz/catkin_ws/install -G Unix Makefiles" in "/home/fadhildz/catkin_ws/build"
####
-- The C compiler identification is GNU 9.4.0
-- The CXX compiler identification is GNU 9.4.0
-- Check for working C compiler: /usr/bin/cc
-- Check for working C compiler: /usr/bin/cc -- works
```

```
fadhildz@DESKTOP-IMTGFNL x + v
-- Using CATKIN_DEVEL_PREFIX: /home/fadhildz/catkin_ws/devel
-- Using CMAKE_PREFIX_PATH: /opt/ros/noetic
-- This workspace overlays: /opt/ros/noetic
-- Found PythonInterp: /usr/bin/python3 (found suitable version "3.8.10", minimum required is "3")
-- Using PYTHON_EXECUTABLE: /usr/bin/python3
-- Using Debian Python package layout
-- Found PY_em: /usr/lib/python3/dist-packages/em.py
-- Using empy: /usr/lib/python3/dist-packages/em.py
-- Using CATKIN_ENABLE_TESTING: ON
-- Call enable_testing()
-- Using CATKIN_TEST_RESULTS_DIR: /home/fadhildz/catkin_ws/build/test_results
-- Forcing gtest/gmock from source, though one was otherwise available.
-- Found gtest sources under '/usr/src/gtest': gtests will be built
-- Found gmock sources under '/usr/src/gtest': gmock will be built
-- Found PythonInterp: /usr/bin/python3 (found version "3.8.10")
-- Found Threads: TRUE
-- Using Python nosetests: /usr/bin/nosetests3
-- catkin 0.8.10
-- BUILD_SHARED_LIBS is on
-- BUILD_SHARED_LIBS is on
-- Configuring done
-- Generating done
-- Build files have been written to: /home/fadhildz/catkin_ws/build
####
#### Running command: "make -j20 -l20" in "/home/fadhildz/catkin_ws/build"
####
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$
```

5. ketika dijalankan **catkin_make** lagi maka workspace akan dibangun ulang, dan output lebih sedikit

```
fadhildz@DESKTOP-IMTGFNL x + v
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$ ls
build devel src
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$ catkin_make
Base path: /home/fadhildz/catkin_ws
Source space: /home/fadhildz/catkin_ws/src
Build space: /home/fadhildz/catkin_ws/build
Devel space: /home/fadhildz/catkin_ws/devel
Install space: /home/fadhildz/catkin_ws/install
####
#### Running command: "make cmake_check_build_system" in "/home/fadhildz/catkin_ws/build"
####
####
#### Running command: "make -j20 -l20" in "/home/fadhildz/catkin_ws/build"
####
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$
```

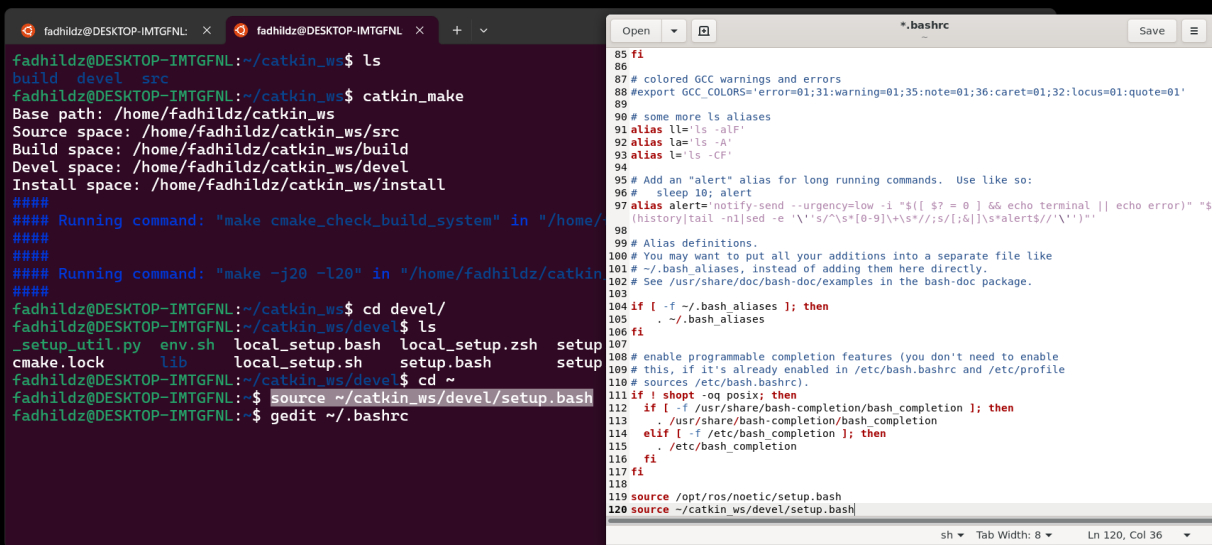
6. **cd devel/** untuk berpindah ke direktori **devel/** yang dihasilkan setelah menjalankan **catkin_make**

```
fadhildz@DESKTOP-IMTGFNL: ~/catkin_ws$ ls
build  devel  src
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$ catkin_make
Base path: /home/fadhildz/catkin_ws
Source space: /home/fadhildz/catkin_ws/src
Build space: /home/fadhildz/catkin_ws/build
Devel space: /home/fadhildz/catkin_ws/devel
Install space: /home/fadhildz/catkin_ws/install
####
#### Running command: "make cmake_check_build_system" in "/home/fadhildz/catkin_ws/build"
####
####
#### Running command: "make -j20 -l20" in "/home/fadhildz/catkin_ws/build"
####
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$ cd devel/
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws/devel$ ls
_setup_util.py  env.sh  local_setup.bash  local_setup.zsh  setup.sh
cmake.lock      lib     local_setup.sh    setup.bash        setup.zsh
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws/devel$
```

7. **source ~/catkin_ws/devel/setup.bash** untuk memuat konfigurasi Catkin Workspace ke dalam lingkungan shell saat ini.

```
fadhildz@DESKTOP-IMTGFNL: ~/catkin_ws$ ls
build  devel  src
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$ catkin_make
Base path: /home/fadhildz/catkin_ws
Source space: /home/fadhildz/catkin_ws/src
Build space: /home/fadhildz/catkin_ws/build
Devel space: /home/fadhildz/catkin_ws/devel
Install space: /home/fadhildz/catkin_ws/install
####
#### Running command: "make cmake_check_build_system" in "/home/fadhildz/catkin_ws/build"
####
####
#### Running command: "make -j20 -l20" in "/home/fadhildz/catkin_ws/build"
####
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$ cd devel/
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws/devel$ ls
_setup_util.py  env.sh  local_setup.bash  local_setup.zsh  setup.sh
cmake.lock      lib     local_setup.sh    setup.bash        setup.zsh
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws/devel$ cd ~
fadhildz@DESKTOP-IMTGFNL:~$ source ~/catkin_ws/devel/setup.bash
fadhildz@DESKTOP-IMTGFNL:~$
```

8. **gedit ~/.bashrc** lalu tambahkan **source ~/catkin_ws/devel/setup.bash** agar setiap kali membuka terminal baru, konfigurasi Catkin Workspace akan secara otomatis dimuat.



The screenshot shows a terminal window on the left and a gedit editor on the right. The terminal window displays the following commands and output:

```
fadhildz@DESKTOP-IMTGFNL: ~/catkin_ws$ ls
build  devel  src
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$ catkin_make
Base path: /home/fadhildz/catkin_ws
Source space: /home/fadhildz/catkin_ws/src
Build space: /home/fadhildz/catkin_ws/build
Devel space: /home/fadhildz/catkin_ws/devel
Install space: /home/fadhildz/catkin_ws/install
####
#### Running command: "make cmake_check_build_system" in "/home/
####
#### Running command: "make -j20 -l20" in "/home/fadhildz/catkin
####
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws$ cd devel/
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws/devel$ ls
_setup_util.py  env.sh  local_setup.bash  local_setup.zsh  setup
cmake.lock      lib     local_setup.sh    setup.bash         setup
fadhildz@DESKTOP-IMTGFNL:~/catkin_ws/devel$ cd ~
fadhildz@DESKTOP-IMTGFNL:~$ source ~/catkin_ws/devel/setup.bash
fadhildz@DESKTOP-IMTGFNL:~$ gedit ~/.bashrc
```

The gedit editor shows the contents of the `~/.bashrc` file, which includes various aliases and functions for the terminal environment. The file is edited in a dark theme. The terminal window is titled `fadhildz@DESKTOP-IMTGFNL` and the gedit editor is titled `*.bashrc`. The terminal window also shows the output of the `catkin_make` command, which includes the base path, source space, build space, devel space, and install space. The gedit editor shows the contents of the `~/.bashrc` file, which includes various aliases and functions for the terminal environment.