General Info

A workspace should be made once at the beginning of the whole project and shouldn't ever be made again.

In a workspace there can be multiple packages. Packages contain all of our code. In our case, I think it's best to have three packages named exercise1, exercise2 and exercise3.

Inside a package there can be multiple python programs / files, of which any or all of them can be loaded and run on the robot.

Creating a Workspace

Create a new folder for workspace and initiate it for ROS

```
mkdir -p ~/<nameofworkspace>/src
cd ~/<nameofworkspace>/src
catkin_init_workspace
```

Build the empty workspace it to generate all the files

```
cd ~/<nameofworkspace>/
catkin_make
```

Open this file in gedit:

```
gedit ~/.bashrc
```

(There is a backup located here ~/.bashrc.backup)

Add these two lines to the bottom of the file and then save and close the terminal

```
source ~/<nameofworkspace>/devel/setup.bash
export ROS_PACKAGE_PATH=/data/private/robot/
<nameofworkspace>/src:${ROS_PACKAGE_PATH}
```

Creating a Package in a Workspace

```
cd ~/<nameofworkspace>/src
catkin_create_pkg <nameofpackage> rospy std_msgs
```

Creating a Node in the Package in a Workspace

```
mkdir ~/<nameofworkspace>/src/<nameofpackage>/scripts
cd ~/<nameofworkspace>/src/<nameofpackage>/scripts
gedit <nameofrunnable>.py
```

… Make that Node …

Building the Node

Give the node executable privileges

```
chmod +x <nameofrunnable>.py
```

Go back to the main directory in the workspace

```
cd ~/<nameofworkspace>/
```

Build the file

```
catkin_make
```

Running the Node

In three separate terminals launch:

```
roscore
roslaunch socspioneer p2os_laser.launch
rosrun <nameofpackage> <nameofrunnable>.py
```

Roscore is the server that handles all the messages between nodes so needs to be running in the background for anything to work.
Roslaunch can load the drivers for a particular piece of hardware (in this case it's the laser).
Any errors with loading roslaunch and do this:

- Wait and try again (the robot could be busy)
- Make sure roscore is loaded in another terminal
- Make sure the robot is turned on and connected to the laptop
- Try replacing .bashrc with the backup, add the two lines to the new file, then restart terminal and try again

Rosrun runs the python file on the robot (make sure the motors on the robot are enabled).