# ROS hands-on tutorial

- Installing Terminator
  - `sudo apt-add-repository ppa:gnome-terminator`
  - `sudo apt-get update`
  - `sudo apt-get install terminator`
  - split screen hotkeys:
    - ctrl + shift + e (vertical split)
    - ctrl + shift + o (horizontal split)

- Recap
  - `rosrun turtlesim turtlesim_node`
  - `rostopic list`
  - `rostopic echo /turtle1/pose`
  - `rostopic pub /turtle1/cmd_vel geometry_msgs/Twist "linear:`
    ```
      x: 1.0
      y: 0.0
      z: 0.0
    angular:
      x: 0.0
      y: 0.0
      z: 1.0" -r 10
    ```

- ROS services
  - spawning the second turtle
    ```
    rosservice call /spawn "x: 0.0
    y: 0.0
    theta: 0.0
    name: ''"
    ```

- Steering the second turtle – remapping arguments
  - `rosrun turtlesim turtle_teleop_key /turtle1/cmd_vel:=/turtle2/cmd_vel`

- Creating your own workspace
  - `mkdir -p ~/catkin_ws/src`
  - `cd ~/catkin_ws/src`
  - `catkin_init_workspace`
  - `cd ~/catkin_ws`
  - `catkin_make`
  - `echo "source $HOME/catkin_ws/devel/setup.sh" >> ~/.bashrc`
  - `source ~/.bashrc`
  - `echo $ROS_PACKAGE_PATH`

- Installing git
  - `sudo apt install git`

- Working with *turtle_canvas_color* package
  - `cd ~/catkin_ws/src`
  - `git clone https://github.com/jelenatabak/turtle_canvas_color`
  - `rosrun turtlesim turtlesim_node`
  - `rosrun turtle_canvas_color change_color.py`
  - `rosrun turtlesim turtle_teleop_key` (the color of the canvas should change as the turtle moves from the upper to the lower part of the turtlesim window)

- Writing a launch file – inspect the final solution by running:
  - `cd ~/catkin_ws/src/turtle_canvas_color`
  - `git checkout e15e1ee195ecd6d7b7b14e05b8dc40e1d629183f`
  - note the change on line 19 in `change_color.py`

HOME ASSIGNMENT:

- Clone the *random_calculator* package (https://github.com/jelenatabak/random_calculator) and run `pub.py` and `sub.py` nodes. List the published topics.
- Write a launch file which will run both `pub.py` and `sub.py` (add `output="screen"` attribute to the `<node>` tag).
- Instead of hard-coding `rate` (line 13 in `pub.py`), expose it as ROS parameter, set it to 1 from the launch file and read it from the `pub.py`.
- The assignment is not mandatory!