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| Task. No.: | 1 | Points: | 5 | Turtlesim Demo |

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| Objectives:  1. Use basic commands in ROS (roscore, rosrun, rqt\_graph, etc). 2. Use topics and messages to control the robot. |

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| Description: This exercise aims to use the turtlesim package to display the turtle on the screen and control the turtle with the keyboard node. You should open a new terminal window for running each command. |

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| Step | Action |
| 1 | Open a new terminal window and run *roscore* command. |
| 2 | In another terminal run turtlesim\_node in the turtlesim package with *rosrun* command. |
| 3 | Open a new terminal window and run turtle\_teleop\_key in the turtlesim package. |
| 4 | Move the turtlebot with arrow key. |
| 5 | Run the rqt\_graph node in the rqt\_graph package in a new terminal window. |
| 6 | Show list of nodes, topics, services in new terminals with *rosnode list*, *rostopic list*, and *rosservice list* commands. |
| 7 | Select one of the services and run it with *rosservice call* command. |
| 8 | Press arrow keys and see the messages with rostopic echo command. |
| 9 | Send commands to turtlebot with *rostopic pub* command to move it instead of using keyboard. |
| 10 | Show list of parameters with *rosparam list* and *rosparam get* commands and change some of them with *rosparam set* command. |
| 11 | Terminate roscore and other node pressing [Ctrl+c] in the corresponding terminal windows. |

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