

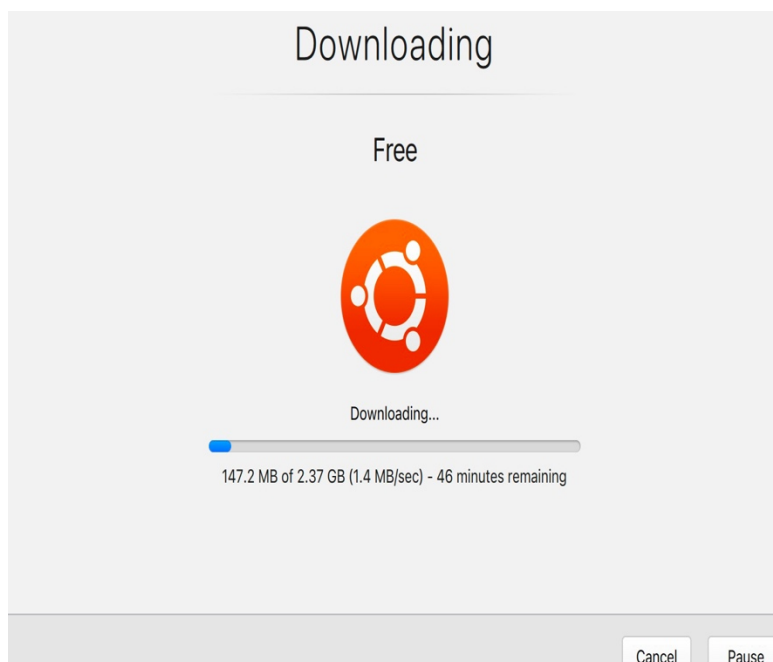
-Task2 Artificial intelligence (AI):

Step by step:

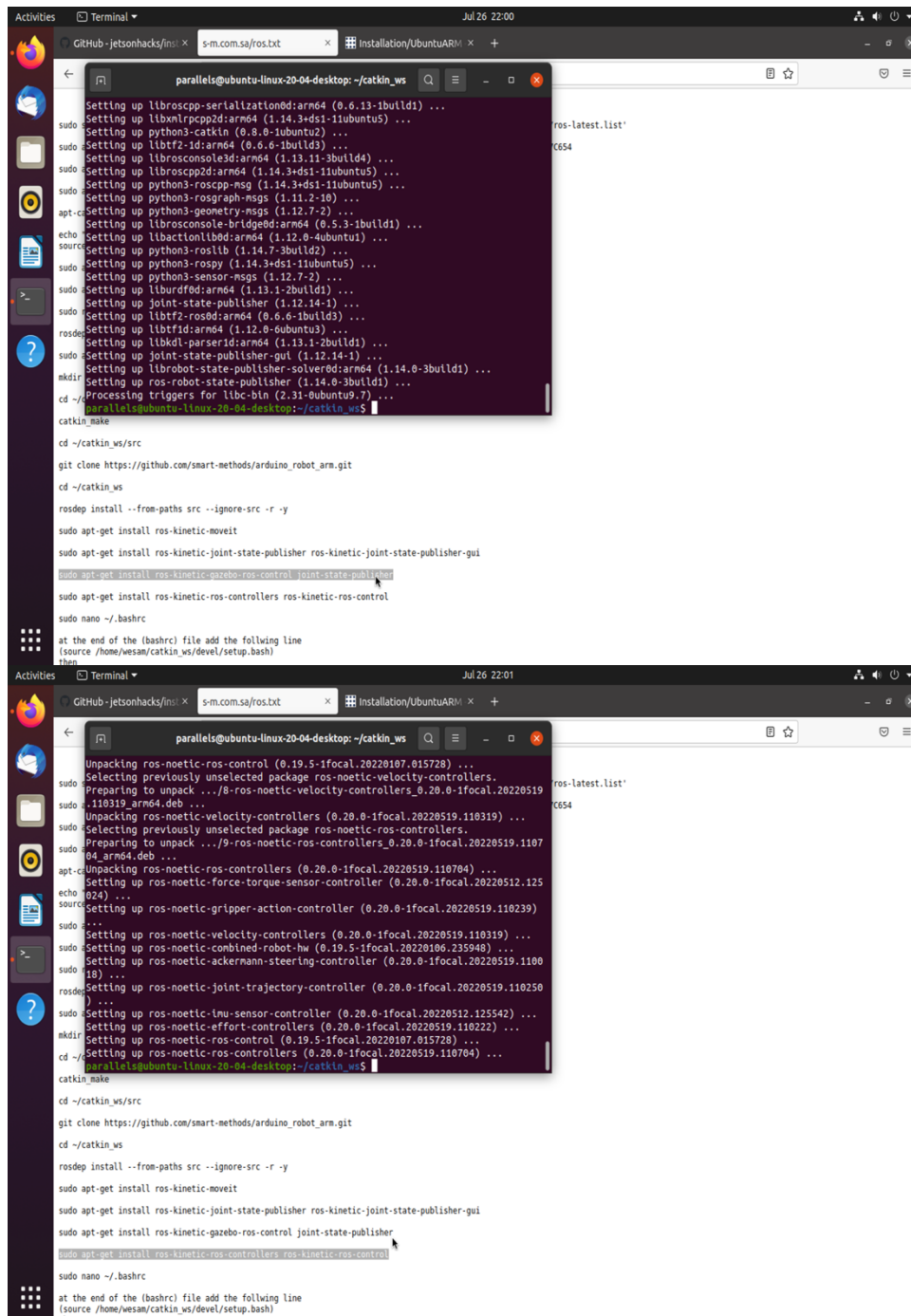
1. VirtualBox



2. and install ubuntu 20.04.2 ARM64



3. Commands to download ROS
4. install ROS
5. commands to arm package in ROS

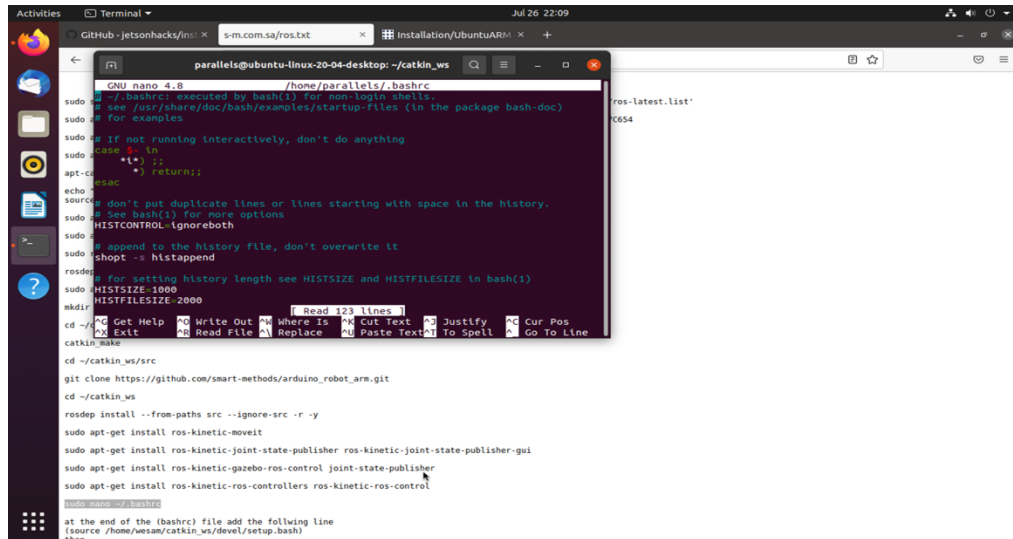


The image displays two screenshots of a terminal window on an Ubuntu ARM system, showing the installation and management of ROS packages.

Top Screenshot: The terminal shows the installation of various ROS packages using `sudo apt-get install`. The packages listed include `libroscpp-serialization`, `libroscpp2`, `python3-catkin`, `libtf2-id`, `libroscpp2d`, `python3-rosmsg`, `python3-rosgraph-msgs`, `python3-geometry-msgs`, `libroscpp-bridge`, `libactionlib`, `python3-roslib`, `python3-rospy`, `python3-sensor-msgs`, `liburdf`, `joint-state-publisher`, `libtf2-ros`, `libtf2-id`, `libkdl-parser`, `joint-state-publisher-gui`, `librobot-state-publisher-solver`, and `ros-robot-state-publisher`. The terminal also shows the creation of a `catkin_ws` workspace and the cloning of the `smart-methods/arduino_robot_arm` repository.

Bottom Screenshot: The terminal shows the installation of ROS packages using `sudo apt-get install`. The packages listed include `ros-noetic-ros-control`, `ros-noetic-velocity-controllers`, `ros-noetic-robot-hw`, `ros-noetic-ackermann-steering-controller`, `ros-noetic-joint-trajectory-controller`, `ros-noetic-lm-sensor-controller`, `ros-noetic-effort-controllers`, `ros-noetic-ros-control`, and `ros-noetic-ros-controllers`. The terminal also shows the creation of a `catkin_ws` workspace and the cloning of the `smart-methods/arduino_robot_arm` repository.

6. install arm package



```

parallels@ubuntu-linux-20-04-desktop: ~/catkin_ws
$ nano .bashrc
# ~/.bashrc: executed by bash(1) for non-login shells.
# See /usr/share/doc/bash/examples/startup-files (in the package bash-doc)
# for examples

# If not running interactively, don't do anything
if [ -z "$PS1" ]; then
    :
else
    # don't put duplicate lines or lines starting with space in the history.
    # See bash(1) for more options
    HISTCONTROL=ignoreboth

    # append to the history file, don't overwrite it
    shopt -s histappend

    # for setting history length see HISTSIZE and HISTFILESIZE in bash(1)
    HISTSIZE=1000
    HISTFILESIZE=2000

    # Read 123 lines
    cd ~
    git clone https://github.com/smart-methods/arduino_robot_arm.git
    cd ~/catkin_ws

    rosdep install --from-paths src --ignore-src -r -y
    sudo apt-get install ros-kinetic-moveit
    sudo apt-get install ros-kinetic-joint-state-publisher ros-kinetic-joint-state-publisher-gui
    sudo apt-get install ros-kinetic-gazebo-ros-control joint-state-publisher
    sudo apt-get install ros-kinetic-ros-controllers ros-kinetic-ros-control

    at the end of the (.bashrc) file add the following line
    (source ~/catkin_ws/devel/setup.bash)
    then

```

