Assignment No: 9

Problem statement : Write a program using Arduino / Rasberry Pi Kit for Demonstration of IOT Application on any one of the following Topics.

- Appliance Remote Control
- Time Lapse Camera Controller
- Security / Automation Sensors
- The Traffic Light Controller
- Temperature Controller

9.1 Hardware Requirements:

- Raspberry Pi B+/2/3
- HDMI Monitor or HDMI to VGA converter
- Digital Relay switch
- 12V Battery supply
- Jumper cables(Male to Male (10), Male to Female(10), Female to Female(10)
- Bread Board
- Ethernet Cable or Wi-Fi adaptor
- USB web-cam

9.2. Starting Raspberry Pi:

Connect power supply, USB Keyboard and Mouse and HDMI display to connectors as shown in figure 9.1. Insert NOOBS (New Out Of the Box Software) preinstalled Micro SD card in Micro SD card slot (Please Note: Micro SD slot is at backside of board). If you don't have NOOBS preinstalled Micro SD card or it is corrupted then follow steps in section 9.2.1 otherwise go to section 9.2.2 directly.

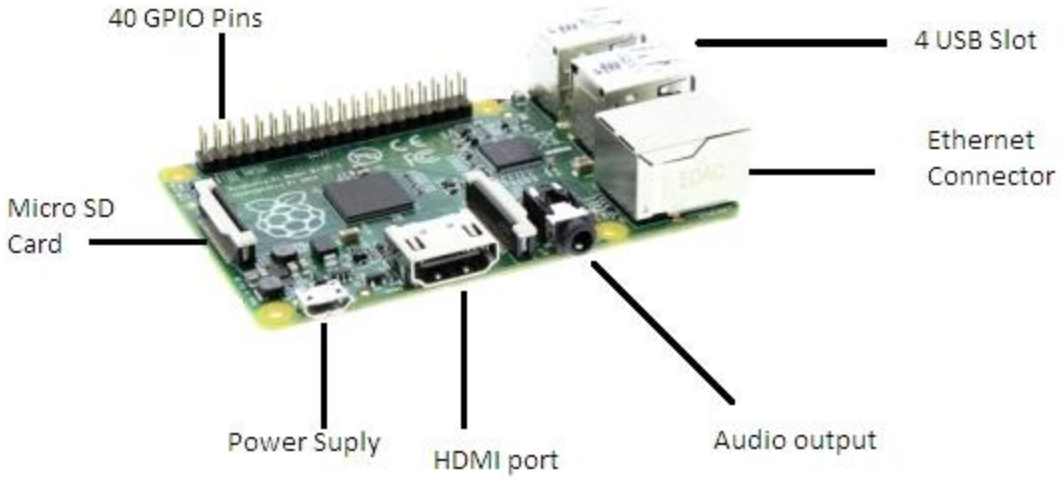


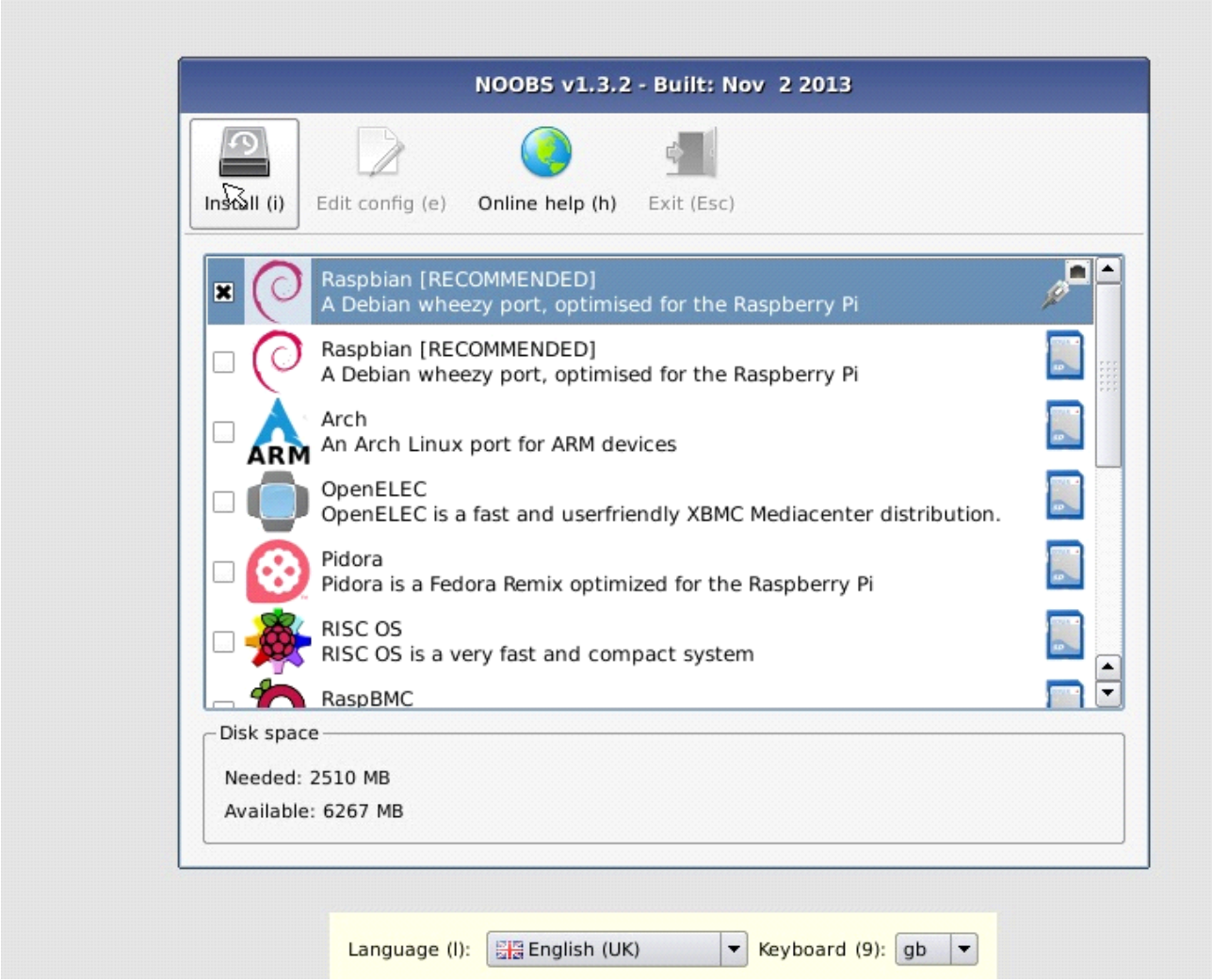
Figure 9.1

9.2.1 Loading NOOBS in SD Card

1. Using a computer with an SD card reader, visit the www.raspberrypi.org/downloads/ page.
2. Click on the Download ZIP button under 'NOOBS (offline and network install)', and select a folder to save it to.
3. Extract the files from the zip.
4. Format your SD card.
5. Drag and drop NOOBS files.

9.2.2 Installing Operating Systems using NOOBS

Now turn on power supply, Raspberry PI will start with NOOBS to install operating system. NOOBS screen is shown in figure 9.2.



Select Raspbian and click on Install.
Please note that default login for Raspbian is username ***pi*** with the password ***raspberry*** . Command to start graphical user interface is ***startx***

9.3. Installing Prerequisite Packages on Raspberry Pi

9.3.1 Update system repositories using following command

sudo apt-get update

9.3.2 Installing python development kit using following command
sudo apt-get install build-essential python-dev python-openssl

9.3.3 Install Pygame for Camera using following command

sudo apt-get install python-pygame

9.3.4 Install GPIO Libraries using following commands

wget http://pypi.python.org/packages/source/R/RPi.GPIO/RPi.GPIO-0.1.0.tar.gz

tar -xvf Rpi.GPIO-0.1.0.tar.gz

cd Rpi.GPIO-0.1.0

sudo ./setup.py install

9.4 Pin-out Diagram of Raspberry Pi B+/2/3