Project 4A
Edison Bring-Up

INTRODUCTION:

The venerable Arduino, while fun and useful, is an old and weak system:
- Limited CPU power greatly restricted the possible processing.
- Limited memory greatly restricted the type of software that could be run.
- The available libraries were minimal, and mostly device related.
- Development had to be done on another system, cross-compiled, and then up-loaded and flashed onto the Arduino.

The Edison is a much more powerful platform. It runs a full-blown Linux system:
- it hosts remote terminal access via both USB and WIFI.
- it has a package manager that can be used to find and download software from the internet.
- it can host its own complier and development tools.

Other than size and power, the biggest differences between an Edison and a desktop computer are:
- the Edison does not have a graphics adaptor or support graphical applications.
- the Edison has a great many programmed I/O pins that can be used to interact with a wide range of sensors and actuators.

These things make it a very reasonable platform for both Embedded System, and Internet of Things projects.

RELATION TO READING AND LECTURES:

None. All of this work is preliminary to embedded system software development.

PROJECT OBJECTIVES:

- ensure students have a working Edison.
- ensure that students can log into their Edison via both USB and WIFI.
- ensure that students have the ability to transfer files to/from their Edison.
- ensure students have a working Edison development environment.
- ensure students have the ability to install new packages on their Edison.

This should be a simple matter of following simple steps. But if you do not have communication with a working Edison development environment, you be unable to complete the remaining embedded systems projects.

DELIVERABLES:

A single compressed tarball (.tar.gz) containing:

- a selfie of you holding your assembled Edison (showing the chip).
- a screen shot from a USB terminal command session in connected to your system, gave it a name and configured network access.
- a screen shot from a local session in which you copy a hello world program from your laptop/desktop to your Edison.
- a screen shot from a WIFI SSH session in which you build and run a trivial program.
- a screen shot from a WIFI SSH session in which you install *git* and clone a reposoitory.
- a README file containing the serial number and WiFi MAC (unless you are using a hard-wired ethernet connnection) MAC address of your Edison and a description of the above files.

PROJECT DESCRIPTION:

1. (if you have not already done so) Read the Intel tutorials on setting up your Edison..
2. Follow the instructions to assemble it, power it up and connect it (via USB) to your personal notebook or desktop.
3. Follow the instructions to establish a USB terminal login session from your notebook/desktop to your Edison.
4. use the configure_edison --setup command to:
   - give your system a name.
   - create a root password.
   - enable and configure WIFI access.
5. Then run the *ifconfig* command to display the IP and MAC addresses, and take a screen shot.
6. Log in to your Edison (over WIFI) via *ssh* (or *putty* or other equivalent tool).
7. On your notebook/laptop, write a trivial C "Hello World" program. Follow the instructions to use *scp(1)* to copy that program from your notebook/ desktop to your Edison (note: this is a pull from your notebook/desktop to the Edison).
   Take a screen shot (on your desktop/laptop) of the successful copy command.
8. Use *ssh(1)* to connect (via WIFI) to your Edison, and compile and run a simple C "Hello world." program. Take a screen shot of the compilation, and execution.
9. Follow the instructions to use the **opkg** package manager to install *git* and then use *git* to clone a local copy of a repository (e.g. your own github repo). Take a screen shot of the clone command and directory listing.

Note that you will probably find it much easier to log in and copy files to your Edison if you set up ssh keys.

SUBMISSION:

Your tarball should have a name of the form lab4a-*studentID*.tar.gz.

Your **README** file must include lines of the form:

- **NAME:** *your name*
- **EMAIL:** *your email*
- **ID:** *your student ID*

GRADING:

Points for this project will be awarded:

Value	Feature
5%	untars expected contents
5%	obtain and assemble your own Edison
10%	successfully establish USB terminal session
20%	successfully establish *ssh* session
20%	successfully copy a file via scp/sftp protocol
20%	successful compilation and execution
20%	successful *git* install and clone