



Skill Badge Requirements: Raspberry Pi

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Guide Contents

Guide Contents	2
Overview	3
Section 1: Configuration	4
Section 2: Understanding the Hardware	5
Section 3: Demonstration	6
Certificate of Completion	7

Overview

Originating in Cambridge University's Computer Laboratory, the Raspberry Pi is a super-affordable educational computing system that has taken the Maker-world by storm. This inexpensive system-on-chip (SOC) breakout for Broadcom's BCM2385 boasts a 700 Mhz ARM with 256MB of RAM, TV, HDMI, stereo audio, USB, SD memory slot, Ethernet and 17 GPIO for general purpose hackery. Each device is capable of running a wide range of operating systems that allow the Pi to function as anything from a media center to the primary control system for a high altitude balloon. In fact, this requirements sheet was written on a Raspberry Pi Model B using a Motorola Lapdock, Raspbian and Leafpad.



Instructions for completion:

Record the section, item number and requirement before each response on your notepaper. This will assist your instructor when evaluating the completion of the requirements.

Example:

2.1 Measure and calculate the surface area (A_{eff}) of the solar cell supplied by your instructor.

- I calculated the surface area (A_{eff}) of my solar cell to be 2 square inches, with the dimensions of 2in x 1in.

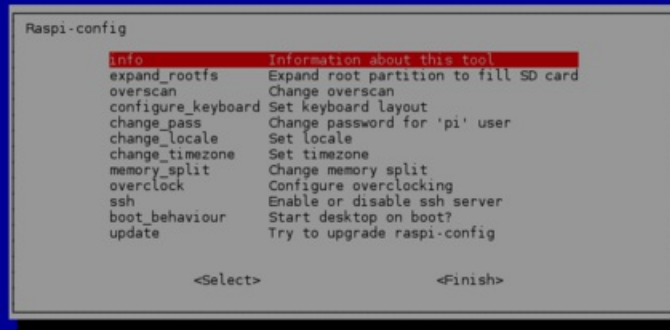
Section 1: Configuration

This section focuses on developing an understanding of the history and philosophy behind the design of the Raspberry Pi

Do EACH of the following and submit to your instructor:

1. Identify and describe FIVE possible applications for the Pi in a K-12 school setting
2. Compare and contrast the potential use of the Pi and the OLPC (One Laptop Per Child) as an educational computer system for third world countries
3. Inform at least three other people about the benefits and philosophy behind using the Raspberry Pi as an educational tool

Section 2: Understanding the Hardware



This section focuses on the Pi's configuration and use

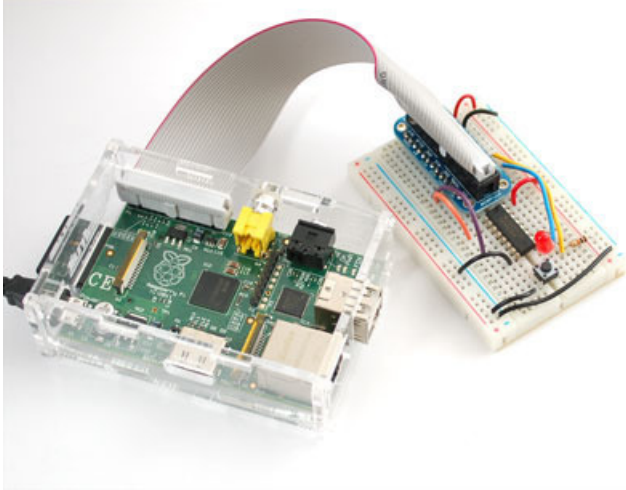
Do EACH of the following and submit to your instructor:

1. Identify and describe the peripherals necessary for operating the Pi
2. Identify and describe the necessity of a good quality 5V power supply
3. Identify and describe potential symptoms of a poor quality 5V power supply
4. Describe the procedure for connecting the peripherals and starting up the system

Do EACH of the following and submit to your instructor:

1. Identify and describe the primary supported operating systems
2. Identify and describe the benefits of each aforementioned operating system
3. Identify and describe the procedure for configuring a SD card for your chosen operating system
4. Identify and describe the methods used to update an already configured system
5. Identify and describe the use of the config.txt file
6. Identify and describe the use the raspi-config application
7. Identify and describe the Internet connectivity options

Section 3: Demonstration



This section focuses on using the Raspberry Pi as the basis for an software/electronics project

Do the following and submit to your instructor:

1. Propose THREE potential projects in which the Raspberry Pi would be more appropriate than a standalone microcontroller (like the Arduino)

Do ONE of the following and submit to your instructor:

1. Using an operating system and programming language of your choice, produce a piece of software that allows for control of the Pi's IO or file system via the Internet
2. Using an operating system and programming language of your choice, complete a predetermined project that utilizes the onboard GPIO
3. Using an operating system and programming language of your choice, construct a unique project that utilizes the onboard GPIO to complete a simple task
4. Using an operating system and programming language of your choice, interface with and control an external hardware device.

Need some ideas? Check out <http://learn.adafruit.com/category/raspberry-pi> (<https://adafru.it/ckb>) !



This certificate is awarded to

*For successful completion of
requirements to earn the*

Raspberry Pi Skill Badge

Issued by:

Date:

