**Project Description**

This stage is part of the group project for CS3307.

**Purpose of the Stage**

The general purpose of this assignment is to propose a group project for the course, helping to set initial requirements and scope for the work you will be doing.  You will also be obtaining and doing the initial setup for a Raspberry Pi kit, giving you a development platform for your project.  In particular, this stage will give you experience in:

* crafting a proposal for a software project
* outlining requirements for a project and identifying risk where it may appear
* setting up and using Raspberry Pi hardware

**Assigned**

Thursday, September 12, 2019 (please check the main [course website](http://owl.uwo.ca/) regularly for any updates or revisions)

**Due**

This stage is due Thursday, September 26, 2019 by 11:55pm (midnight-ish) through an electronic submission through the [OWL site](http://owl.uwo.ca/). If you require assistance, help is available online through [OWL](http://owl.uwo.ca/).

**Late Penalty**

Late assignments will be accepted for up to two days after the due date, with weekends counting as a single day; the late penalty is 20% of the available marks per day. Lateness is based on the time the assignment is submitted.

**Group Effort**

This stage of the project is expected to be a group effort, with each member of the group contributing equally in a reasonable fashion.   Feel free to discuss ideas with other groups in the class; however, your submission must be the work of your own group.  If it is determined that you are guilty of cheating on the assignment, you could receive a grade of zero with a notice of this offence submitted to the Dean of your home faculty for inclusion in your academic record.

**What to Hand in**

Your stage submission, as noted above, will be electronically through [OWL](http://owl.uwo.ca/).  You are to submit all relevant documentation as discussed below.  Only one submission per group is necessary.  (As groups have yet to be fully formed, the group submission aspect of this stage of the project has not been set up in OWL.  This will be done in the near future.)

**Stage Task**

In this stage, you will craft a proposal for the group project that you will be working on in this course.  As discussed in class, you will be able to choose what you are doing for the project, provided that it uses the Raspberry Pi as a computing platform and is written in the C++ programming language.  We will provide feedback on your proposal to shape things further and make sure that each group is working on something of comparable scope and difficulty.

Furthermore, in this stage, you will receive your Raspberry Pi kit (one of [these kits](https://www.canakit.com/raspberry-pi-3-model-b-plus-ultimate-kit.html)) and do some initial set up and configuration of the kit, as described below, to ensure that you are ready to go with your project.

**The Proposal**

Your proposal should be roughly 1-2 pages in length, with a cover page giving a tentative name to your project, indicating your group number, and listing your group members.  The body of your proposal should be composed of the following sections.

**Description**

This should provide an overview of your project, describing it in enough detail that the reader will have a pretty good idea of what you are aiming to do in the project.  The focus, of course, should be on the software you are developing, but be sure to discuss any hardware elements you might be using in conjunction with the Raspberry Pi.

**Features**

In this section, you detail the various features of your project.  It is likely easiest to present this in the form a bulleted list, providing enough information in each point to give the reader a sense of the scope and degree of difficulty of each feature.  You should organize your features into three separate lists:

* Required features.  These features are core to the project and must be delivered to have a [minimum viable product](https://en.wikipedia.org/wiki/Minimum_viable_product).  In other words, you cannot get by without these features.
* Optional features.  These features are not strictly needed, but would definitely help round the project out to something more complete, robust, and usable.  You can get by without these features, but your project would be improved if you could implement and deliver them.
* Wish-list features.  These features are definitely not needed and are complex or time consuming enough that they are not likely to be delivered.  That said, doing so would add an additional layer of polish and finesse to your project and so would still be worth doing if you had the time and resources for them.

**Risks**

Every project has factors that can threaten its successful delivery.  Sources of risk can include lack of familiarity with technologies used in the project, reliance on technology that might be unstable, brittle, or complex to use, and so on.  In this section, you should identify and discuss the risks associated with your project, as well as potential strategies for mitigating those risks.  Risks on their own are not necessarily a bad thing, especially if you have ideas on how to handle them should the need to do so arise.

**Other Notes**

If there is anything else you would like to discuss about your project, now is the time to do so.  In particular, this would be a good time to discuss additional libraries/packages/technologies that you plan on using with your project, if they haven't already been mentioned.  This is also a good time to discuss particular group expertise of note, especially if it will be leveraged in some way for the project.  (For example, if a group member has experience in connecting sensors to a Pi and you are proposing an Internet of Things project, that is worth mentioning here.)

**References**

This section is optional, but if you have references to any papers, documents, books, or websites that are relevant to your project or this proposal, here's a good spot to list them.

**The Raspberry Pi**

As discussed above, aside from producing a proposal for your group project, this project stage also requires you to collect your Raspberry Pi kit and do some initial set up and configuration for it.

To begin, you will need to receive your Raspberry Pi kit from our Program Assistant, Alexandra Bannon.  She is generally around during standard university operating hours, so feel free to drop by the main office (Middlesex College 355) to collect things.  She will have some paperwork for your group to sign off on to receive the kit, so be sure to go there altogether to get things.  Don't go to collect your kit until the groups have been finalized and posted, even if you think you have your group sorted out already.  (You will need your final group number to collect a kit.)

With your Raspberry Pi in hand, you can now proceed with initial set up.  Some documentation is included with the kit and you can find other documentation online [here](https://www.canakit.com/quick-start/pi).  You should read and follow these instructions in setting the Raspberry Pi up!   Please note that we have some new kits this year and some kits that were used last year.  If you receive a kit that was used last year, you will want to start with a fresh install of the Pi software on its Micro SD card.  To re-flash the card in such a case, detailed instructions can be found [here](https://www.raspberrypi.org/help/noobs-setup/2/).  If you are starting with a new kit, you do not need to do this as the card in the kit should be ready to go as it is.

Please use the case included with the kit to protect the Pi, and wait until the appropriate step to insert its Micro SD or else you could damage things during assembly.  You should be sure to be gentle in handling the case during assembly as trying to force something could end up breaking things.  If you have difficulty with assembly and would like assistance, please feel free to connect with me, a TA, or [Science Technology Services](https://helpdesk.sci.uwo.ca/).

To complete set up, you will need an HDMI display as well as a keyboard and mouse.  To assist with setting things up on campus, Science Technology Services have set up an "IOT Station" in Middlesex College 342 with what you need to complete the process.  (If demand dictates it, they can always get another one set up for us, so please let me know if this gets overly crowded and too busy.)  Please refrain from unplugging computers in the labs to get what you need and use the IOT Station!  Going forward, we hope that you will be able to use your Raspberry Pi headless, accessing things over the network, and so the IOT Station will be primarily needed only for setting things up initially.  Details on this will follow shortly.

To demonstrate that you have successfully set up your Pi, we ask that you take a picture of the screen with the Pi booted and running.  On the screen, you should have a terminal open showing the results of you having just executed the "ifconfig" command.  In particular, the picture should clearly show the MAC address for the ethernet interface on the Pi (eth0).  You should include this picture, along with the MAC address typed up in your stage submission.  (The MAC address can be included inline in the text box on the submission page or in a separate text file attached to your submission.)  We will need this MAC address to register the Pi for our wired network on campus, which will assist in enabling remote access for you down the road.