# COSC2669 WIL Project Milestone 1

## Group submission for Team 18:

* Yonn April
* Andrew Chen
* Laura Pritchard
* Tyler Saxton
* Hao Wan

**5/6 bullet points describing the progress so far**

* Attended Datathon kick-off presentations as a team, and discussed strategy and timelines [ALL]
* Set up communication channel (WhatsApp group) and collaboration channel (Slack workspace) and Knowledge-Sharing repository ("Files" on Canvas) [ALL]
* Researched any published "prior art" where satellite/aerial photography has been used to gain insights [Laura]
* Researched the Queensland sugar cane industry to develop some subject matter expertise, including references that we can cite when estimating sugar cane production volume per square metre [April]
* Researched the availability of other datasets on nationalmap.gov.au and other sites, that may be helpful/needed for "use cases" under consideration (e.g. property boundaries to identify farms, soil quality samples, etc.) [Hao]
* Documented the project plan for the first week, and tasks to be allocated in weeks 2-4 [Tyler]
* Created step-by-step instructions to help the team install and configure the required development software, and run the supplied demo program [Tyler]
* Created Python classes to load each "Tile Snapshot" as an object, with band images, tile geometry, and date-specific metadata [Tyler]
* Created Python script to generate "mask" to identify pixels that are obscured by clouds, and research prior art [Andrew]

**5/6 bullet points describing your current plan for the next 3 weeks**

* Decide on a "source control" tool (e.g. github) and document processes to ensure that the whole team can use it. Integrate code contributions so far from multiple authors.
* Continue foundation code development that is applicable for all use cases:
  + Compare "cloudCover" metadata to the percentage of cloud in each "clout mask". Can we use this to measure the quality of the mask? Inspect images vs cloud mask. Refine cloud mask methodology if required.
  + Load a time series of images and metadata into Python data structure
  + Apply "sugar cane field mask" and "cloud mask" to determine which date each pixel transitioned from growing->harvested
  + Detect pixels that appear to have been harvested at the same time, and group them together as a "field"
  + Investigate whether we can use a "property boundary" dataset to group "fields" into "farms", in case we want to report at that level
  + When "phase 2" data is released, create code to consolidate data for multiple tiles into a single great area
* Decide which use case(s) to pursue, based on what sounds very insightful, and what additional data is available
* Consider whether we could gain any valuable insights by applying "machine learning" or "deep learning" algorithms to the time series data. This might not be necessary, depending on the use case. Research new techniques if required.
* Sketch out a design for what we would like our final app(s) to look like and explore our options for implementing the app (e.g. Tableau report, Jupyter notebook custom website, mobile app on iOS/Android, etc.)

**[optional] Any issue/bottleneck that you may have encountered so far or you think you may have in the near future**

* This project will require us to learn new coding techniques. Even the presenters at the "hackday" seemed uncertain about the best way to load ESRI shape files or convert them into GeoJSON format. We will need to allocate appropriate amounts of time to research the required techniques, and share them amongst the team. And remain in contact with the other Datathon participants and organisers via "Telegram" and the official "Medium" blog.
* We might not always be able to find and load the data we need for a particular use case. We are allowing time to research what is available, and we will choose our use case(s) based on what is feasible. There are plenty of options!
* Creating our final app(s) could take a lot of time and effort! We will need to carefully assess what's feasible, and choose a platform that is appropriate for our available skills and timeline.
* Work to ingest the data, generate cloud masks, etc. is progressing very well so far, but choosing a use case and designing an app that can demonstrate value will ultimately determine the success of the project. We’ll be investing plenty of time and resources in this area.