1. **Read the readings suggested above**
2. **For your 577 project**
   a. *Pick one metric that can be used to track your development schedule and progress*
   b. *Pick one metric that can be used to track the size and scope of your project*
   c. *Pick one metric that can be used to ensure quality of your product **rt)***
   d. *During software deployment, pick one metric that your client / maintainer should use to monitor the health of your operating software*
3. **For each metric in question 2**
   a. *Identify the benefits of the selected metric such as how can the selected metric help you in managing the project?*
   b. *Where do you plan to get the data from? How often do you plan to collect the data?*
   c. *Give an example of how to represent data that you collect for this metrics. (what are the units of data on your x-axis and y-axis, see example below)*

(A) Pick one metric that can be used to track your development schedule and progress:
    Progress Indicator

-Identify the benefits of the selected metric such as how can the selected metric help you in managing the project?
The software development schedule is crucial to a timely completion of the project. This should take resources into account such as budget, size/skill-set of team, and deadlines in order to properly set a development schedule. These attributes can fluctuate and in turn affect the progress of the project which will change the schedule. So carful monitoring of the initial trajectory of progress and how it changes over time can help predict future progress trends and thus can help the project managers adjust requirements or resources as needed.

-Where do you plan to get the data from? How often do you plan to collect the data?

I plan to get the data from task assigning software like Jira. Once we develop all the initial requirements there will be tasks assigned to everyone reflecting all the requirements. We will be able to collect the statistics of the system by seeing how many tasks have been finished, how many are unfinished, how many haven't been started, and the rate of new tasks being created. We can collect this data monthly which will give us a nice slope to work with to make predications over the span of a 2 year project or longer. For the case that is shorter, I would consider collecting the task data weekly in order to make timely predictions. This will give an accurate indication of the progress being achieved or lost over the time line of the project.

-Give an example of how to represent data that you collect for this metrics. (what are the units of data on your x-axis and y-axis, see example below)

I would choose a Burn Up Line Chart to represent the data. The Y-Axis will represent the number of work items completed that can be thought of as Jira tickets. Depending on the size of the

project it can be hundreds or single digits. The X-Axis will be monthly increments of when we collected the data. On the line graph we will have two different line, one representing how much work needs to be done and another line representing what has been done so far. The idea is to get our done line to meet the requirements line. This chart can be very useful to predict our velocity of progress using our current pace of progress by calculating the average pace of progress. We can then see if we need to change requirements in the requirements line or push back the deadlines to eventually have our two lines meet.

[1]

[2]
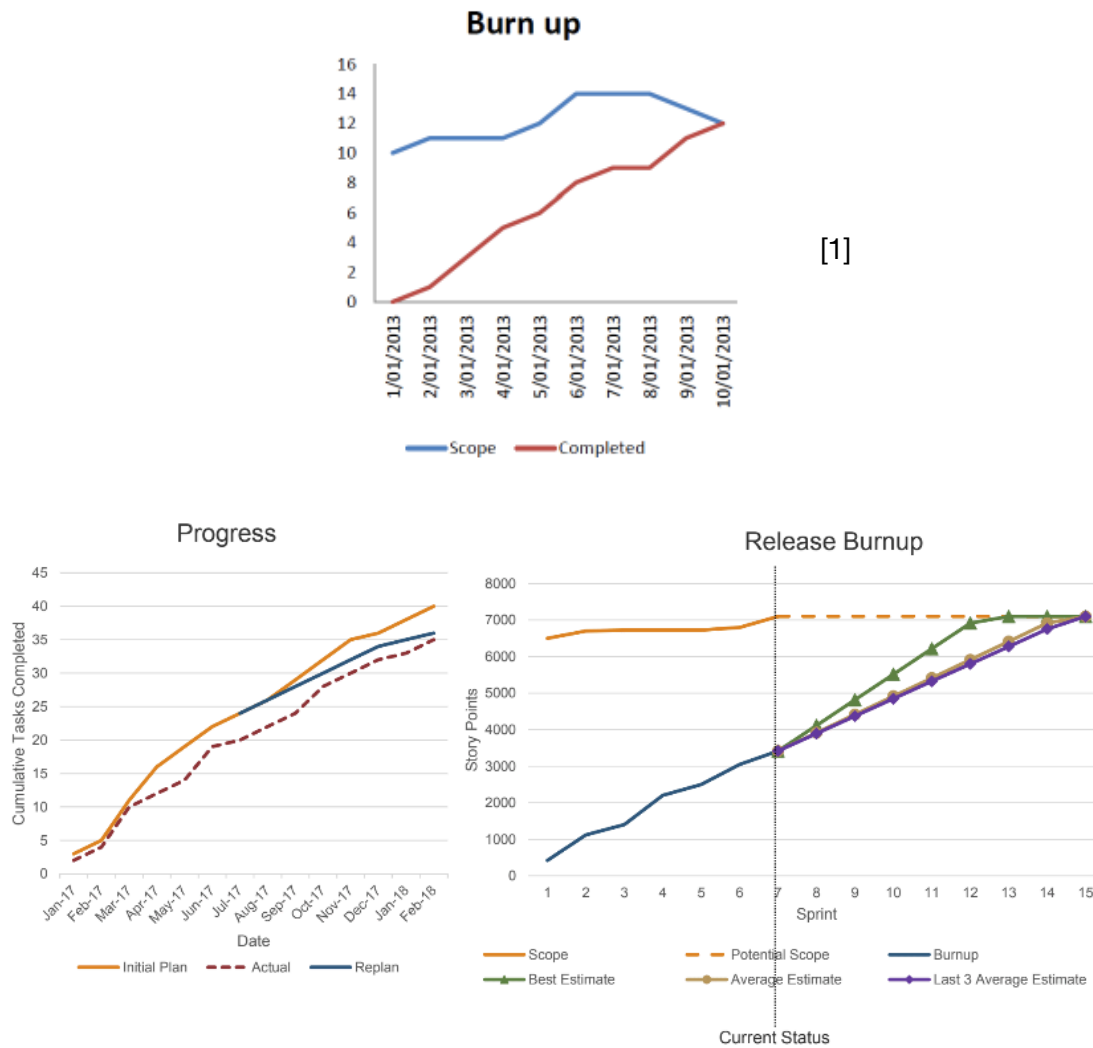
(B) Pick one metric that can be used to track your development schedule and progress:

Code Complexity/SLOC

-Identify the benefits of the selected metric such as how can the selected metric help you in managing the project?

When gathering the Source Line of Code this can help put in perspective how large the project is getting. This total can then be compared to other projects to know to determine either we how much more code our system may need or how much we over added. I would put this metric along side code complexity as lines of code is very simple and both are being gathered from the code. The code complexity will also help show the size of the system and the size of different modules within the system. This will help testers know what modules may be more important than others when dedicated resources to development.

-Where do you plan to get the data from? How often do you plan to collect the data?

I plan to get the data using software tools like Junit that will be able to get all the analytics of the software project. These available software tools will give the ability to collect the lines of code and visualize the size of modules within the system. I would most likely collect the data per milestone of the development phase. I expect to collect this monthly during the development phase in the spring.

-Give an example of how to represent data that you collect for this metrics. (what are the units of data on your x-axis and y-axis, see example below)

Using the software tools available to analyst the software project, I focus my attention to the graph showing the size of modules in a tree like structure. This specific software tool visualizes the different modules as nodes in a tree structure with their dependencies being parent nodes. The nodes can be different sizes illustrating the usage of that module which will most likely translate to the importance of that module. Additionally this will of-course give us the total lines of code which can be used and a single number to compare to other projects.

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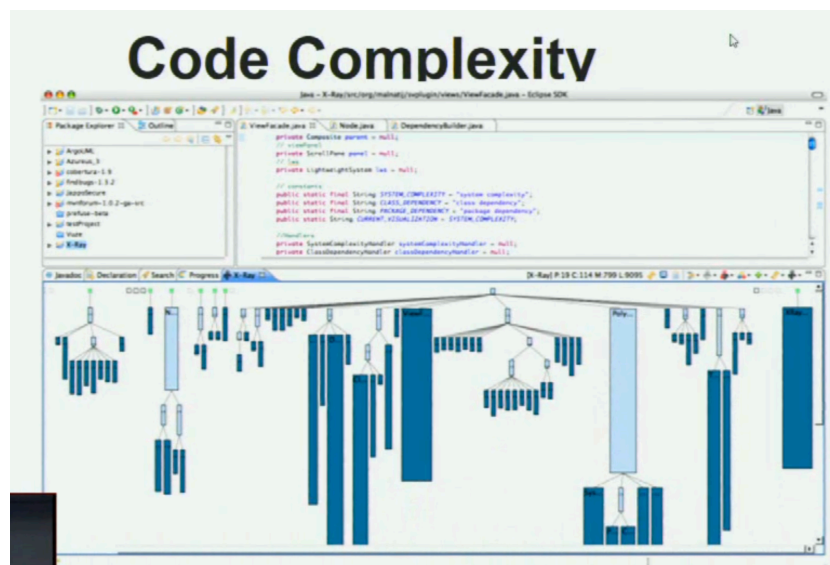
(C) Pick one metric that can be used to track your development schedule and progress:
Test Progress

-Identify the benefits of the selected metric such as how can the selected metric help you in managing the project?

By using the test progress metric we can not only track progress but we will be able to see the quality of our software change over time. This is done as we try to increase the number of tests passed while increasing the number of tests implemented. If we are increasing the number of tests given to our system then we are getting closer to testing all aspects of the system. Moreover if we see a trend in increased passed test then we can conclude the quality of our system is getting better on the basis of our tests. (Which hopefully we are administering good tests on the basis of true requirements)

-Where do you plan to get the data from? How often do you plan to collect the data?

I plan to get this data simply recording all tests being done to the system and making sure we note done what has failed and what has succeed. This data will be collected on a tested basis, so drastically depending on the testing needs of the system. On our projects timeline with the class I expect to collect the data on a weekly basis.

-Give an example of how to represent data that you collect for this metrics. (what are the units of data on your x-axis and y-axis, see example below)

The data can be represented in a similar fashion as the progress line chart. We will have one line representing the number attempted tests on the system and another line representing the passed tests. The Y-Axis will have the number of tests and the X-Axis will be weekly increments. This is a very versatile graph as you can add additional data lines like the the number of failed tests which would run opposite of the passed lines. Or we can add a planned test line such as the NASA has added in the graph below.

[3]
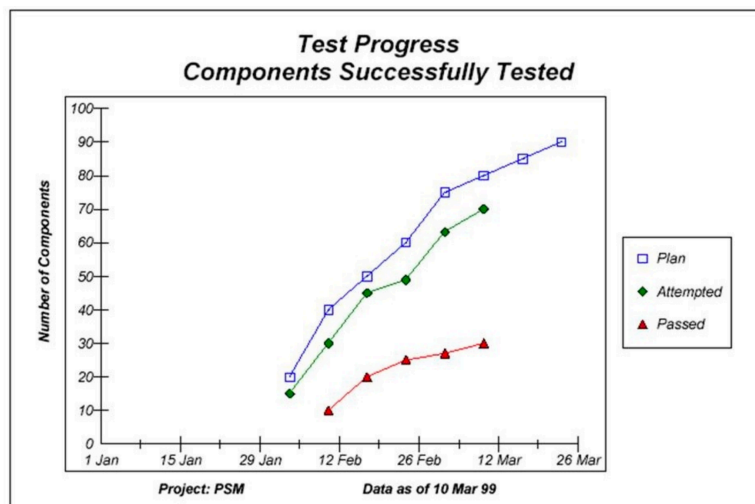
(D) Pick one metric that can be used to track your development schedule and progress:
     Deployment Metric - Memory Usage

-Identify the benefits of the selected metric such as how can the selected metric help you in managing the project?

Monitoring the memory usage after deployment will be critical for our client and maintainers. This will be critical because our project will have a communication channel between users like video chat, audio chat, and messaging chat that will have to be saved in the data base. Particularly with the video chat this can be problem as storage will sky rocket. Thus when monitoring memory usage this will allow the project managers or client/maintainers to see when storage is getting full and either buy more storage or develop a different solution.

-Where do you plan to get the data from? How often do you plan to collect the data?

I will plan on getting this data from the web services that are provided when hosting their site. We are focused on a mobil application but there is a web application team which we will be connected to. Thus all the interaction from the mobile phone will directed to the web application where they will be able to see all the analytics, specifically the memory storage.

-Give an example of how to represent data that you collect for this metrics. (what are the units of data on your x-axis and y-axis, see example below)

The storage can be represented with the Y-Axis being the amount to storage, probably in GBs. The X-Axis will represent time as the back-end for the mobile app and the web app while deployed. As time passes the amount of storage will fluctuate showing a live look at the amount of storage being used. It will be important for it to update quickly as the storage could change for example if a profile is deleted and thus all the connected data is deleted.

[2]
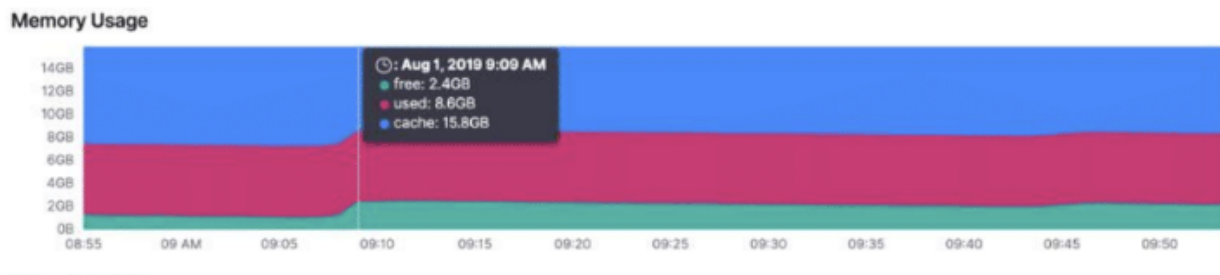
References:

[1] "Burn up vs burn down chart" *Clarions Technology,* http://www.clariostechnology.com/productivity/blog/burnupvsburndownchart.

[2] Koolmanojwong, Supannika. *Software Metrics and Measurements*, https://www.dropbox.com/s/yxa6gh4y1quqk27/CS577a%20EC-19-SoftwareMetricsMeasurements.pptx?dl=0. PowerPoint Presentation.

[3] "Planning the Measurement Activities" *Nasa Software Engineering Handbook*, https://swehb.nasa.gov/display/7150/7.14+-+Implementing+Measurement+Requirements+and+Analysis+for+Projects?%23_tabs-2