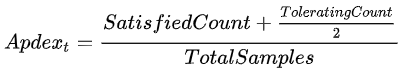
## Question 1

A software metric is a measure of software characteristics which are quantifiable or countable (Stackify 2017). Software metrics are important for many reasons, including measuring [software performance](https://stackify.com/application-performance-metrics/), planning work items, measuring productivity, and many other uses (Stackify 2017).

1. Apdex is a software metric measure which aims to quantify and measure the user satisfaction of a software application. The Apdex method converts various software metrics into a single number on a scale of 0 to 1, 0 being the lowest and 1, the highest. The formula can be seen below.  
   
2. Response Time measures the server response of every single transaction or query. Response time starts when a user sends a request and ends at the time that the application states that the request has completed (Guru99 n.d.). Average response time is the average of the response time measurements. The goal for software response time is 0.1 seconds with 1 second being the maximum upper limit, and most users will close the application if response time is greater than or equal to 6 seconds. Response time can be measured using applications such as JMeter and Load Runner.
3. The Error Rate is a mathematical calculation which displays the percentage of problem requests against all requests (Guru99 n.d.). Most errors, in the case of a web application, will be identified through the HTTP status codes returned by the server. However, some errors are not captured through that method and these errors must be accounted for separately. Errors also tend to raise in frequency as server load increases.

## Question 2

To be added by Shereece

## Question 3

To be added by Shereece

## Question 4

Software Process Improvement Models aim to evaluate the software product, project, quality and drawbacks in order to streamline the software process.

1. The Capability Maturity Model involves a layered approach including 5 levels in order to refine the software development process. The first level is the initial level where processes are not sufficiently documented or replicable. Next is the repeatable level where organization has been developed and successes are now repeatable. After this is the defined level where a standard software processed has been developed. The managed level is next which is where the organization can now control and monitor its software processes. Finally is the optimizing level where software processes are constantly being improved through monitoring and feedback. An advantage of CMM is that higher CMM levels directly correlate to lower software defects. A disadvantage is that the level system of CMM is very rigid and may not tell a complete story.
2. Capability Maturity Model Integration is a process and behavioural model that helps optimize process improvement and decrease risks in development. CMMI also follows a level system which is the same as CMM but due to various improvements, it is more applicable in safety critical environments. An advantage of CMMI is that it fosters a mindset of quality maintenance within the programming team. A disadvantage is that while CMMI describes what process should be implemented by the organisation, it does not specify how.
3. Continuous Quality Improvement refers to identifying issues and solving them in a continuous cycle. It is a theory-based management system which focuses on processes and outcomes. An advantage of CQI is its flexibility, allowing the organization to quickly meet changing requirements. A disadvantage is the model’s difficulty of implementation as it requires an organization wide commitment to its practices.
4. The Plan-Do-Check-Act model is a four-stage approach to continuously improving processes. It involves testing possible solutions, assessing results and implementing the successful solutions. The Plan phase involves identifying and analysing the problem. Do refers to testing the possible solution. Check is where the result is studied for effectiveness. Finally, Act is where the solution is implemented if the Check phase is passed. The advantage of PDCA is that it instils a mindset of continuous improvement which can improve efficiency and productivity over time. However, the disadvantage is that the PDCA cycle can be much slower than a straightforward solution implementation.
5. The ISO9000 model was defined as a set of standards for quality management and assurance to help document the quality systems necessary for an efficient organization. It is based on 7 quality management principles which can be applied to promote organizational improvement. These are, customer focus, leadership, engagement of people, process approach, improvement, evidence-based decision making and relationship management. Some advantages of ISO9000 are increased marketability, reduced operational expenses and improved internal communication. The disadvantage is that attaining ISO9000 certification can be quite costly due to the documentation and overhead requirements.

# References

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