# Explain key concepts of cloud computing

Cloud computing has many notable features that make it a more preferred choice over local machines when it comes to large projects. Below are a few features in particular that make cloud computing stand out, but it is by no means a exhaustive list.

* Scaling & Elasticity

To people who know little about cloud computing, the ability to run programs at large scales is probably one of the first things that comes to mind when they hear cloud computing. Indeed, the necessity to compute at scale was one of the drivers that initiated cloud computing. After decades of development, scaling in the cloud has become much more advanced than when it started out. Now, scaling is as much about being dynamic as having the capability to compute at scale. The ability to dynamically scale up resources when computation becomes intensive and scale down resources when jobs are few is referred to as being elastic in the industry. Since cloud computing jobs are run on ultra-powerful machines, it is important to ensure that the computing powers are always allocated to the jobs that need them the most. An elastic system helps solve this issue by defining a way to add more resources as needed instead of provisioning a set amount of resource for each job at the beginning.

* Continuous Integration / Continuous Delivery  
  Another feature of cloud computing is the ability to allow teams to collaborate across geographies. With so many people, many of whom might never meet each other in person, collaborating on the same project, it can become tedious and expensive to enforce standards on every commit. Continuous integration ensures that only code that complies with the organization’s standards can be committed. Organizations can also set up basic testing to ensure that the code will run with their infrastructure. Continuous delivery acts as another rail guard that ensures code in production is correct. CI and CD together provide a consistent and cost-efficient way to ensure the quality of the organization’s code.
* Monitoring & Logging

With so many people collaborating on the same project and some many programs running simultaneously in the cloud, some things will surely break at some point in time. This is where monitoring and logging comes handy. Proper monitoring helps organizations catch failures as they occur, and well set-up logging helps organizations get to the bottom of failures quickly. Since jobs on the cloud can be resource-intensive, monitoring and logging are not as simple as tracking and recording everything that happens. Deciding how to present real-time information and what level of detail to log is a complex engineering question. However, things don’t stop there. Nowadays, a monitoring and logging system won’t be complete unless it has the capability to react to messages automatically. For example, a monitoring system should be able to decide how to act when a server fails, and it should be able to act in a way to ensure that minor failures don’t affect computational power while sever failures don’t compromise results.

* Serverless

Serverless is a new trend in cloud computing that saw considerable growth in popularity over the last few years. The idea behind serverless is that cloud service providers take care of provisioning the infrastructure by providing it as a black box solution so that users can focus on building their applications. Serverless technology is step towards democratizing cloud computing, since users who do not possess extensive knowledge of infrastructure will also be able to set up applications on the cloud.