# IT4090 – Cloud Computing

## Semester 2, 2021

## Group Assignment – 15 marks

Deploy the containerized application you developed in your individual assignment to a Kubernetes cluster in AWS or Azure cloud.

- You can use one of your group members containerized application for this or develop a fresh one.
- Application logic / API tier and the front-end tier should be stateless containers with the ability to auto scale.
- Database tier should be a stateful container.
- Application logic can be any function which can be auto-scaled.
- In the front-end tier, you only need to focus on the functionality, no need to use complex front end frameworks and UI/UX designs, a simple HTML/CSS application would be sufficient.
- You can use any OS for Docker containers and you can use any publicly available docker image as the base of your containers.
- You must use terraform and/or ansible to deploy your application to the cloud.
- You can create a new Kubernetes cluster in cloud using VMs or you can use managed Kubernetes services like AKS or EKS for this. However, deployment of the cluster should be done using terraform/ansible.
- Use the official terraform resource provider for your selected cloud solution provider.

You also need to submit a report with following.

  - Explaining the architecture of your application
  - Explaining the application logic / algorithm of your application / API tier.
  - A step by step guide on deploying your environment on cloud with screenshots.

You also need to submit the source code including all the files associated with terraform / ansible / docker / Kubernetes setup.

- Submit a soft copy of the report with the source code and the README file in a single zip (compressed folder) file through the moodle.

- The README file should contain instructions on how to deploy the source code you submitted to the cloud.

- **Marking Scheme**
    - You will be awarded 15 marks in total for this assignment.
    - From that,
        - 6 marks will be allocated to the report
        - 6 marks will be allocated to the application working as instructed in the README file and if the solution has followed all the requirements given above.
        - Last 3 marks will be awarded if you can provide a one step deployment of your application to the cloud. i.e. you should provide a script (PowerShell is preferred) so that by executing that script in an unattended manner (no user input is required), it should deploy the application to the cloud. It can accompany a configuration file, which can be used to enter cloud credentials and other variables that the script might use.

- Refer following video playlists to get an idea on the technologies involved. You can always refer advanced concepts of these technologies in YouTube etc.

    - Getting started with Ansible 01 - Introduction - YouTube
    - What is Terraform? | Terraform Tutorial | #1 - YouTube
    - What is Kubernetes | Kubernetes explained in 15 mins - YouTube