

## **Assignment 2**

Assignment 2 will contain 35% of total assessment for this course. It should be an application by using cloud platforms and technologies. Some sample reports (rated as excellent or good) from previous years are provided with category to get an idea about the difficulty and depth of the application. Summer courses are fast paced and so you should think and start your assignment early. You are free to choose any programming language, any cloud platform and any services/API you want to use.

### **Group formation**

- You need to form a group of 4 member. If you unable to form 4 members group, then 3 members group is also fine.
- It is recommended that Postgrad (COSC 2640) and Undergrad (COSC 2626) students form group separately. A group containing mix of Postgrad and Undergrad can be allowed to match skills and balance team members.
- The members of group not necessarily have to be in the same lab session.
- You need to select a group representative/team leader who will be responsible for main communication with the tutor.
- The group representative should confirm group name, group members (name and student number), group representative name (team leader) and assignment proposal by class 5 and register to canvas group. We have created placeholders for groups in Canvas.
- Each group will be moderated by one of the tutor. A tutor will be assigned for moderation after group formation. This tutor will assess corresponding group's final outcome. All communications between team and tutor should be through canvas group only.
- Each member must have equal contribution (25% each for 4 members) in the assignment. When you form a group please make sure at least one/two members have good programming skills and at least one member has good design skill.
- If you are unsure about the requirement, discuss your proposal with your tutor / lecturer.
- If you fail to form a group and finalise a proposal by class 5, then you will be allocated to a default group (from remaining students who failed to form group or in a group with member shortage) and will be assigned an assignment by cloud computing teaching team.
- The representative should inform the tutor immediately if he/she finds that a group member is not contributing according to the expectation of the group.

## Criteria/Assignment requirement

1. You must have a distributed model for your application. Your architecture should have at least 3 distributed components. You can use any distributed system concept for your application as discussed in Lecture 3. (e.g. separate component for processing and storage/ Multi-node cluster/ multiple processing servers/ multiple cloud features / Integration of multiple REST APIs/ IoT/ Edge computing/ Fog Computing/Publish subscriber model/ Peer to Peer system/ Push notifications).
2. You must have some analytical component in your application that demonstrate the use of cloud services. The use of tools/techniques such as Hadoop MapReduce, BigQuery, APIs, SQS, Microservices, Endpoints, AWS Services, Real-time data analysis, IoT, Sensors or complex mathematical formulas will make your application interesting. You may not learn all of the tools but if you learn them by yourself, it will be highly appreciated as well as helpful for your application.
3. You should take advantage and demonstrate the use of Cloud storage (e.g. S3, Google Cloud Storage) and Cloud Datasotre (e.g. Google datastore, Amazon DynamoDB, MongoDB or any Relational Database Services) in your application.
4. You should have a nice client-side visualization (e.g. a webpage/website or a mobile app). If you have any kind of data analysis you should interpret your result nicely using tabular and/or graphical format. Cloud data visualisation will be discussed in Lecture.
5. For web application you should to deploy your application either in Google cloud or AWS or any other public cloud platform (e.g. Azure, Bluemix, Alibaba) to your preference.
6. All students should have equal contributions in the group. If fewer contributions are identified, then the student will get less mark than his/her group-mates.

## Assignment Options

### Option 1

Development of a cloud application using your own idea and strength.

### Option 2

Development of a cloud application using idea suggested by Tutor/Lecturer based on your interest and strength.

### Option 3

You may refer to **Lecture-4\_Cloud\_Applications or in Sample report**, where several applications were discussed (the applications are from previous years). You may choose one of them as your assignment or somewhat similar.

*If you are interested in doing any **IoT** application you need to manage the hardware by yourself.*

### Demonstration

You must demo your application to your assigned teacher according to the scheduled demonstration time (Will be announced around class 10). All demonstrations will be conducted by day 12 (4 Feb 2019). There will be no consideration for extension.

If you fail to demonstrate then you will be marked based on your submitted report. In such case, the maximum mark you can get is the pass mark (including your mark in assignment-1). If you do not demonstrate and submit any report then you will get 0 in this assessment.

All team members must present during demo time and explain individual contributions. The demo can be from 20 to 30 minutes for each team. Keep everything ready and make your application live during your demo.

You need to bring a **3-slide presentation** during the demo. The presentation slide should contain 1) team member information, contributions, 2) application architecture and 3) objectives/what it does.

### Submission

You need to submit a report. The deadline of submission of your Assignment-2 in Canvas is **6<sup>th</sup> February 2019**. If you submit after that you will get 0. Only one submission of a group member is required. The team leader should submit the report from canvas group.

### Report

You need to submit a report according to the following guideline.

**Your report** should be in word/pdf document extension. You can make your own format or follow the sample reports that has been provided in Canvas.

The report should contain the following materials

- a. A title of your application
- b. Group name, Group members name and student numbers

- c. **Contribution:** of individual team members and their percentages
- d. **Links:** Live url of your application (if any), repository url (github/bitbucket/google drive/dropbox) of your source code (if any), public dataset links of your application (if any). A downloadable link to images/figures used in your document.
- e. **Summary:** The objective/purpose of your application.
- f. **Introduction:** Say something about your application such as:
  - i. What are the motivations behind your idea?
  - ii. What it does?
  - iii. Why it is required?
  - iv. How it can be used as real-life application?
  - v. The advantages/positive/new things of your application.
- g. **Related work:** Refer some related works similar to your application.
- h. **Software Design/Architecture**
  - i. A high level architectural diagram that shows the communication between different cloud components used in your application and purpose of using those components.
  - ii. Description of your dataset/data structure/APIs/sensors you used for your application (if any) [use figures if required]
- i. **Implementation - Developer Manual:** A step-by-step guideline to reproduce your application [use figures if required] and make it live. This is like our tutorial sheet. For known/general description (e.g. creating and MySQL RDS instance in AWS, deploying application in Elastic Beanstalk, deploying application in Google cloud) you can refer to any web link directly. You can also refer to tutorial sheet if you have similar steps in your description (e.g. deploy application in Google cloud).
- j. **User manual:** A documented overview (with screenshots) of how to use your application or a link to a video tutorial of a user manual.
- k. **Discussion:** What are the new things you learned in the process of doing this assignment. What were the challenges. What your targeted but failed to achieve and how they can be improved.
- l. **References:** Important references/website links that you use to develop your application.

# Marking Guideline

The following table is a marking guide for the assignment (group mark).

- Group formation by class 5 – **1 mark**
- Application idea, formulation, task distributions – **1 mark**
- Demonstrate the progress of the application to assigned moderator at class 9 and class 11 (all team members not necessarily need to be present) – **1 mark**
- Selection of appropriate cloud tools and technologies – **1 mark**
- Skill development in learning new tools and technologies – **1 mark**
- Appropriate utilization of cloud tools/technologies/services in your application – **4 marks**
- Analytical component in your application – **4 marks**
- Application architecture and the distribution of your components – **4 marks**
- Application implementation, functionalities – **4 marks**
- UI / Data visualisation – **4 marks**
- A fully functional application– **2 marks**
- 3-slide presentation during demo – **1 mark**
- Report – **7 marks**