# M7024E Laboratory 3: Programming Cloud Services - Compute Services

Welcome to the third laboratory of the M7024E: Cloud Services course. In this course, we will use the application programming interfaces (APIs) provided by the Amazon Web services[1] to program Compute services provided by Amazon EC2.

**Deadline: 24 Nov. 2017.**

**If you are adding more funtionality, deadline is 23 Nov. 2017 (TBD with Karan).**

## 1 Objectives

The objective of this lab is to:

- Develop Cloud services for managing the EC2 compute services using the APIs provided by AWS.
- Develop Cloud services for monitoring the EC2 compute services using the APIs provided by AWS.

## 2 Exercises

## Setting up the programming environment:

If you have setup your programming environment, goto step 6 directly.

1. Go through the lecture (week 2) on *"Programming Cloud Services"* and setup your credentials on your computer.
2. Download the *AWS SDK for Java Developer Guide: Rel. 1.*[2]
3. Download the latest version of the Java SDK.
4. Download the latest version of Java IDE, for example Netbeans, IntelliJ or Eclipse.

[1] https://aws.amazon.com/. Retrieved: 04 Nov. 2017.

[2] http://docs.aws.amazon.com/sdk-for-java/v1/developer-guide/aws-sdk-java-dg.pdf [Online]. Accessed: Nov. 10 2017.

5. Setup the AWS SDK for Java as described in the lecture in week 2. You might want to use Apache Maven that is usually a part of an Java IDE, for example, NetBeans.

6. Setup your Java project and the pom.xml file to use the AWS EC2 service. See the Java Developer Guide.

**Exercise** a: In this exercise, you will learn how to use the compute service provided by AWS.

1. Identify ways of creating the Amazon EC2 service clients. Look at the lecture slides and the Java Developer Guide.

   (a) Explain in detail how the Amazon EC2 service clients are created by providing details of the packages and classes involved. Create a diagram of the dependencies involved.

2. Create a Java program to manage your EC2 instance. Start with *listing region names and their endpoints.*

3. Write a method to *run an instance from the list of regions ("Frankfurt/Ireland") from the previous step.*

   (a) Use <keypair, security groups, number of instances, etc> as parameters to start an instance.

4. Write a method to *retrieve the status of your running instance(s).*

5. Write a method to *stop an instance(s) that you started.*

**Exercise** b: In this exercise, you will learn how to use the monitoring service provided by AWS.

1. Identify ways of creating the CloudWatch clients

2. Write a Java program to monitor the status of your EC2 instances

   (a) You should use as many metrics as possible. For example, CPU utilization, disk I/O, etc.

**Exercise** c: Be more creative! Add more methods of your choice, build a CLI or a UI. Discuss with Karan regarding the scope and deadline.