

National College of Ireland

MSc in Cloud Computing REPEAT EXAM

Release Date on Moodle: 08 of Dec 2023 @1000
Online Moodle Submission Deadline: 05 of Jan 2024 @1600

Cloud Platform Programming

This Repeat Terminal Assignment is worth 100% of the total marks for those repeating this module.

IMPORTANT: It is your responsibility to avoid plagiarism. Please read the comprehensive guidelines on academic honesty and academic integrity, and how to avoid plagiarism made available by the NCI Library (<https://libguides.ncirl.ie/referencingandavoidingplagiarism>).

NOTE: YOU ARE NOT ALLOWED TO PUBLISH THIS ASSIGNMENT BRIEF OR A PART THEREOF ON ANY WEBSITES. YOU ARE NOT ALLOWED TO PUBLISH/SHARE YOUR SOLUTION WITH OTHERS. All work submitted **should be your own**. Conferring with others **is not permitted**.

All coursework will be electronically screened (via Turnitin) for evidence of academic misconduct (copying and collusion).

Introduction

The repeat assessment of the Cloud Platform Programming module is based on Terminal Assessment which represents 100% of the module assessment.

The learning outcomes of the Cloud Platform Programming module are as follows:

- LO1. Demonstrate in-depth knowledge of core cloud-based services.
- LO2. Critically analyze advantages and disadvantages of different cloud-based technologies/ services.
- LO3. Formulate and produce new code libraries that implement advanced programming constructs in order to create secure, dynamic, configurable, robust, scalable cloud-based applications.
- LO4. Construct and present a complex dynamic cloud-based application through selecting relevant cloud related architectural patterns and services taking into account the evaluation and assessment of application design, development, and testing methodologies.
- LO5. Identify and ethically apply best practices for continuous integration, delivery and deployment of cloud-based applications.

Assignment Description

A company has commissioned you to prepare a case study to help them with the migration of their system to a cloud-based architecture using suitable cloud-based services offered by Amazon Web Services (AWS). The company asks you to identify all the cloud-based services that enable them to deliver a scalable cloud-based application to their customers.

You are required to prepare a report to document the case study for a company in a given domain/ industry. The given domain/industry is assigned based on the penultimate i.e. second to last digit of your Student ID as described in the *Table 1 Industry Sectors*. You may choose a European company in the industry sector assigned to you that is publicly traded to have access to significant amounts of information.

Table 1 Industry Sectors

Penultimate (i.e. second to last) digit of Student ID	Industry Sector
0	Pension
1	Secondary Schools
2	Seminars, Conferences and Exhibitions
3	Property Sales
4	Finance
5	Tourism
6	Entertainment
7	Retail Supermarket chains
8	Courier and Delivery Services
9	Fitness

IMPORTANT: Each student must work on the correct industry based on the guidelines from *Table 1 Industry Sectors*. For example, if your student ID number is 203576**9**4, the penultimate i.e. second to last digit of your Student ID is 9, and therefore the industry sector assigned to you is Fitness.

IMPORTANT: This is a submission requirement. If the incorrect industry sector is chosen, the report will not be valid, and no marks will be awarded.

Your case study should document for a company in the assigned industry sector:

- Functional and non-functional requirements of the system
- At least five functionalities/features provided by the system
- Suitable cloud-based services offered by Amazon Web Services (AWS) that enable the development of a scalable cloud-based solution that supports the specified system requirements and functionalities, together with a critical analysis of their advantages and disadvantages
- An architecture diagram of the system which includes the cloud-based services proposed to be used, and their interactions with the main components of the system
- Code a sample library in an object oriented programming language that should provide meaningful information to the assigned industry sector and explain the purpose of the library in the report. You should upload the source code on GitHub and share the link in the report..

You must conduct some independent research and include any relevant bibliography. It is unlikely that you will find all the information needed for your report through online searches. Therefore, you are allowed to may **make assumptions about your company** (educated guesses) to complete the information. Please ensure that you state your assumptions, distinguishing them from verifiable information.

As a starting point you may find it useful to review the documentation and white paper available at:

- AWS Cloud Adoption Framework, the Platform Perspective: <https://aws.amazon.com/professional-services/CAF>
- SaaS Lens – AWS Well-Architected Framework – “Best practices for architecting your software as a service (SaaS) applications on AWS”: https://docs.aws.amazon.com/wellarchitected/latest/saas-lens/saas-lens.html?did=wp_card&trk=wp_card

Deliverable

A 6-8 pages report (formatted using the IEEE Conference double-column template¹) which documents your case study for the assigned industry sector. The report should include:

- Abstract – a 150-300-word executive summary of the case study and its main findings
- Introduction – set the scene of the case study including its objectives and a generic overview of the industrial sector and its needs
- Description of the company, and its system including functional and non-functional requirements of the system. The system should provide at least five functionalities/features.
- Architectural design and explanation
 - Proposed cloud-based solution for the system including the architecture of the system and the cloud services identified
 - Diagram should indicate where different cloud-based services fit into the system/application
 - Critically analyse advantages and disadvantages of different cloud-based technologies/services, and justification for the choice of services
- Conclusions including findings/interpretations – what did you learn and find out?
- References – a complete list of academic works and/or online materials used in the project. References should be included as in-text citations using the IEEE referencing style.

IMPORTANT:

- Remember that your report must not only be merely descriptive, but **it must provide your critical insights, that is, your own analysis and points of view.**
- Your work must be **original**, so you must ensure that you do not choose a company which already adopted cloud-based services and that information is available. This would be considered plagiarism.

Assessment Criteria

Introduction & Description of the company, and System Requirements	15%
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¹ <https://www.ieee.org/conferences/publishing/templates.html>

Architectural Design & Explanation	25%
Cloud-based Services and Critical Analysis	30%
Library Creation	10%
Conclusions and findings	10%
Comprehensiveness, Abstract, Structure & Bibliography (the report encompasses relevant theory; quality of sources, correct referencing is used)	10%

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