

Cloud Computing and Web Services (MMI226816)
Coursework 1 Diet 1 2023/2024 Requirements

The coursework is worth 50% of the overall module mark and is an individual coursework, not a group coursework.

Specification

The purpose of this coursework is to allow you to demonstrate your understanding of cloud application development using cloud technologies available on Google Cloud. The work is split into tasks with details provided in this specification on the work required for each task.

Task 1

Undertake the following:

- Create a Linux **Compute Engine** instance that is suitable for web serving and has low operating costs. Use a name and region within Europe of your choosing. Your instance must allow HTTP and HTTPS network traffic.
- Install and test a **web server** of your choosing to your instance.
- Copy a photographic image file of your choosing to your instance and show that it can be served by your web server using a URL of your choosing.
- Develop and test a simple **App Engine** app, using a supported programming language of your choosing, that displays information when accessed using a web browser. The information provided should include your **name**, **Student ID** and the **time and date** when the web browser access took place. You should test your app both locally and remotely.

Task 2

Undertake the following:

- Create a Cloud Storage bucket configured to replicate its content to two regions with a storage class appropriate for frequent access.
- Upload at least three image files to the bucket and make sure all are publicly accessible.
- Create an HTML file that can display the images in your bucket with an appropriate caption for each image. Copy your HTML file to your compute engine instance and show that it can be served by your web server and displays the images.
- Develop and test a second **App Engine** application that can be used to view the images stored in your storage bucket. The application must support serving images with an appropriate caption, using the example URL paths shown in Table 1, by providing a response containing HTML. Your app must be tested both locally and remotely.

Table 1 Example Image URL Paths

URL Paths	Image Displayed
http(s)://<hostname>/<chosenpath>/1	The first image only
http(s)://<hostname>/<chosenpath>/2	The second image only
http(s)://<hostname>/<chosenpath>/3	The third image only

NB <chosenpath> should be replaced with a path of your choosing.

Task 3

Undertake the following:

- a. Use **APIs Explorer** to find an appropriate REST API and method that can be used to retrieve the metadata for a resource contained in a Google cloud storage bucket. Using the REST API documentation determine the URL required to obtain the metadata for an image stored in your storage bucket and provide evidence that you have tried out the method in **APIs Explorer**.
- b. Develop and test a third **App Engine** app which uses the example URL paths provided in Table 1 but with a different **<chosenpath>**. Your app must call your chosen REST API method and serve a subset of the metadata for an image in your bucket by providing a response containing JSON. The subset of information provided in your response must include the image **file name**, **type of content**, **file size** and the **time of creation**. In addition, you must add your **Student ID** and the **request time and date** to the response. You must call the REST API method each time a request is received by your app to serve the metadata. You should test your app locally and remotely.
- c. Secure your **App Engine** app using **Google Identity-Aware Proxy (IAP)** ensuring only you can access it. You should test your secured app remotely.

Documentation

A **report is required**, documenting the work you undertook to complete each coursework task. Your report must include a headed section covering each task. All your source code **must be included directly in the report** and not provided only as a screen capture. Your code must be explained in detail in your narrative so that it is clear what it does. If your own code is based on existing code, you must make this clear in your report by indicating where the existing code was obtained and explain any changes you have made to the code to meet your needs. Screen captures included as supporting evidence of undertaking your work must also be explained in detail in your narrative.

Submission

An electronic copy of the coursework should be submitted via Turnitin on GCULearn.

A Turnitin link for the coursework submission is available in the 'Assignments and Tests' section on GCULearn. You must submit your report in Microsoft Word file format. You may submit any number of draft versions of your coursework to Turnitin. A similarity report will not be provided by Turnitin until the due date.

There is no suggested word limit for this coursework.

Your submission document should conform to the following format
<student_id>_CCWS_CW1 e.g. S1712345_CCWS_CW1.docx

The submission deadline is: 5pm, Friday 5th April 2024 to GCULearn.

Do not leave it until the last minute to work on and submit your report.

You are warned that any plagiarism will be dealt with according to the relevant university assessment regulations.

Marking Scheme and Rubric

This coursework is marked out of 100 and accounts for 50% of the overall CCWS module mark. The marks available for each task are shown in Table 2.

Within each task marks will be awarded, as appropriate to the task, for your account in your narrative of the work undertaken to complete the task, the number of the requirements you have managed to meet and the quality of your solution.

Specifically, more marks will be allocated for narrative that is clear, provides a complete description of the work undertaken and is supported by screen captures and source code listings providing evidence of the work.

Table 2 Marking Scheme for CCWS CW1

Submission Tasks	Available Marks
Task 1	30
Task 2	35
Task 3	35
Total	100

A rubric indicating the criteria used in the grading each of the tasks required to be completed for this assignment is shown in Table 3.

Table 3 Rubric for CCWS CW1

Mark Range	0% – 39%	40% – 49%	50% – 59%	60% – 64%	65% – 69%	70% – 79%	80% – 100%
Evaluation	Clear Fail	Marginal Fail	Satisfactory	Good	Very Good	Excellent	Exceptional
Task 1 Description	Your work makes no sense and/or is poor concerning the requirements of task 1.	Your work is relevant but fragmentary concerning the requirements of task 1.	Your work is adequate but limited concerning the requirements of task 1.	Your work is mostly elaborated concerning the requirements of task 1.	Your work is well elaborated concerning the requirements of task 1.	Your work is thorough concerning the requirements of task 1.	Your work is systematic/critically reasoned concerning the requirements of task 1.
Task 2 Description	Your work makes no sense and/or is poor concerning the requirements of task 2	Your work is relevant but fragmentary concerning the requirements of task 2	Your work is adequate, but limited concerning the requirements of task 2	Your work is mostly elaborated concerning the requirements of task 2	Your work is well elaborated concerning the requirements of task 2	Your work is thorough concerning the requirements of task 2	Your work is systematic/critically reasoned concerning the requirements of task 2
Task 3 Description	Your work makes no sense and/or is poor concerning the requirements of task 3	Your work is relevant but fragmentary concerning the requirements of task 3	Your work is adequate, but limited concerning the requirements of task 3	Your work is mostly elaborated concerning the requirements of task 3	Your work is well elaborated concerning the requirements of task 3	Your work is thorough concerning the requirements of task 3	Your work is systematic/critically reasoned concerning the requirements of task 3