MODULE NAME:	MODULE CODE:
CLOUD DEVELOPMENT B	CLDV6212

ASSESSMENT TYPE: POE (PAPER AND MARKING RUBRIC)

TOTAL MARK ALLOCATION: 300 MARKS

TOTAL HOURS: A MINIMUM OF 45 HOURS IS SUGGESTED TO COMPLETE THIS ASSESSMENT

By submitting this assignment, you acknowledge that you have read and understood all the rules as per the terms in the registration contract, in particular the assignment and assessment rules in The IIE Assessment Strategy and Policy (IIE009), the intellectual integrity and plagiarism rules in the Intellectual Integrity and Property Rights Policy (IIE023), as well as any rules and regulations published in the student portal.

INSTRUCTIONS:

1. ***No material may be copied from original sources, even if referenced correctly, unless it is a direct quote indicated with quotation marks. No more than 10% of the assignment may consist of direct quotes.***
2. ***Please ensure that you submit your assignment through SafeAssign.*** *Please make sure you attach a similarity report to your POE if you are required to submit a hard-copy of your PoE.*
3. ***Make a copy of your assignment before handing it in.***
4. *Assignments must be typed unless otherwise specified.*
5. *Begin each section on a new page.*
6. *Follow all instructions on the PoE cover sheet.*
7. *This is an individual assignment.*
8. *Answer All Questions.*
9. ***Instructions for submitting your assessment:***
    a. *Use of good programming practice and comments in code is compulsory.*
    b. *Save your solution/project files in your GitHub repository for this module.*
    c. *Save all files (including any source code files, template files, design files, image files, text files, database files, etc.) within your GitHub repository.*
    d. *Do NOT save zipped (archive) files in your GitHub repository unless specifically instructed to do so.*
    e. ***Important:*** *Upon completion of your assessment, you must save and close all your open files before submitting your work. You will submit your assessment on the LMS page for this module.*
    f. ***To complete your submission:*** *Create a document in MS-Word or Notepad for each part of the POE. The document name for each part of the POE must follow the format explained in the POE instructions.*
    g. *In this document include the following: Your student number, the module code, all required answers,* ***the link to your GitHub repository*** *where you saved your practical work, and the URL of your web application.*
    h. *Submit this document in the LMS, using the submission links for this module.*

Referencing Rubric

Providing evidence based on valid and referenced academic sources is a fundamental educational principle and the cornerstone of high-quality academic work. Hence, The IIE considers it essential to develop the referencing skills of our students in our commitment to achieve high academic standards. Part of achieving these high standards is referencing in a way that is consistent, technically correct and congruent. This is not plagiarism, which is handled differently.

Poor quality formatting in your referencing will result in a penalty **of a maximum of ten percent being deducted from the percentage awarded**, according to the following guidelines. Please note, however, that **evidence of plagiarism in the form of copied or uncited work (not referenced), absent reference lists, or exceptionally poor referencing, may result in action being taken in accordance with The IIE's Intellectual Integrity Policy (0023)**.

Markers are required to provide feedback to students by indicating **(circling/underlining) the information that best describes the student's work.**

Minor technical referencing errors: 5% deduction from the overall percentage – the student's work contains **five or more errors** listed in the minor errors column in the table below.

Major technical referencing errors: 10% deduction from the overall percentage – the student's work contains **five or more errors** listed in the major errors column in the table below**.**

If both minor and major errors are indicated, then 10% only (and not 5% or 15%) is deducted from the overall percentage. The examples provided below are not exhaustive but are provided to illustrate the error

Required: **Technically correct referencing style**	**Minor errors in technical correctness of referencing style** **Deduct 5% from percentage awarded**	**Major errors in technical correctness of referencing style** **Deduct 10% from percentage awarded**
Consistency • The same referencing format has been used for all in-text references and in the bibliography/reference list.	Minor inconsistencies. • The referencing style is generally consistent, but there are one or two changes in the format of in-text referencing and/or in the bibliography. • For example, page numbers for direct quotes (in-text) have been provided for one source, but not in another instance. Two book chapters (bibliography) have been referenced in the bibliography in two different formats.	Major inconsistencies. • Poor and inconsistent referencing style used in-text and/or in the bibliography/ reference list. • Multiple formats for the same type of referencing have been used. • For example, the format for direct quotes (in-text) and/or book chapters (bibliography/ reference list) is different across multiple instances.
Technical correctness • Referencing format is technically correct throughout the submission. • The correct referencing format for the **module's discipline** has been used, i.e., either **APA,** OR **Harvard** OR **Law.** • Position of the reference: a reference is directly associated with every concept or idea. • For example, quotation marks, page numbers, years, etc. are applied correctly, sources in the bibliography/reference list are correctly presented.	**Generally, technically correct with some minor errors.** • The correct referencing format has been consistently used, but there are one or two errors. • Concepts and ideas are typically referenced, but a reference is missing from one small section of the work. • Position of the references: references are only given at the beginning or end of every paragraph. • For example, the student has incorrectly presented direct quotes (in-text) and/or book chapters (bibliography/reference list).	**Technically incorrect.** • The referencing format is incorrect. • Concepts and ideas are typically referenced, but a reference is missing from small sections of the work. • Position of the references: references are only given at the beginning or end of large sections of work. • For example, incorrect author information is provided, no year of publication is provided, quotation marks and/or page numbers for direct quotes missing, page numbers are provided for paraphrased material, the incorrect punctuation is used (in-text); the bibliography/reference list is not in alphabetical order, the incorrect format for a book chapter/journal article is used, information is missing e.g. no place of publication had been provided (bibliography); repeated sources on the reference list.
Congruence between in-text referencing and bibliography/ reference list • All sources are accurately reflected and are all accurately included in the bibliography/ reference list.	**Generally, congruence between the in-text referencing and the bibliography/ reference list with one or two errors.** • There is largely a match between the sources presented in-text and the bibliography. • For example, a source appears in the text, but not in the bibliography/ reference list or vice versa.	**A lack of congruence between the in-text referencing and the bibliography.** • No relationship/several incongruencies between the in-text referencing and the bibliography/reference list. • For example, sources are included in-text, but not in the bibliography and vice versa, a link, rather than the actual reference is provided in the bibliography.
In summary: the recording of references is accurate and complete.	In summary, at least **80%** of the sources are correctly reflected and included in a reference list.	In summary, at least **60%** of the sources are incorrectly reflected and/or not included in reference list.

Overall Feedback about the consistency, technical correctness and congruence between in-text referencing and bibliography:

Background

ABC Retail, a rapidly growing online retailer, currently manages its order processing system using an aging **on-premises** infrastructure. They store customer orders and product information in a **traditional relational database** system, which struggles to handle the increasing volume of transactions during peak shopping seasons like Christmas Holidays and other relating holidays.

Additionally, the company stores product images in **network shared drives**, leading to storage inefficiencies and slow access times. The message queuing system, powered by **legacy middleware**, lacks scalability and reliability, often resulting in message delivery delays and processing errors. As a result, ABC Retail is facing customer complaints, missed sales opportunities, and operational inefficiencies.

Despite migrating their order processing system to the cloud, ABC Retail continues to face challenges in handling **real-time event processing** and reliable **message queuing**. Their current setup relies on a combination of custom-built event processing pipelines and third-party messaging solutions, which lack the scalability and flexibility needed to support the company's growing business demands. As a result, ABC Retail experiences delays in order processing, inconsistent messaging delivery, and difficulty in maintaining and scaling their existing infrastructure.

ABC Retail's current **data analytics** infrastructure struggles to keep pace with the growing volume and complexity of customer data. **Traditional relational databases** and **on-premises analytics tools** are unable to efficiently process and analyse diverse data types, leading to delays in generating actionable insights. As a result, ABC Retail faces challenges in personalizing customer experiences, optimizing product recommendations, and improving operational efficiency.

Instructions

The Portfolio of Evidence (POE) requires you to create the **Azure compute and data storage components for ABC Retail**. These will be progressively developed through Part 1 and Part 2 that build on each other to create a final solution for CLDV6212.

To work on the POE, students are required to:

- Have access to an Azure account with available credit. This access will be arranged by your lecturer/campus at the start of this module.
- Use Microsoft Visual Studio for your coding.
- Save source code in a GitHub repository. This access will be arranged by your lecturer/campus at the start of this module.

The submission of each part of the POE will require you to do the following:

- Create a **document** in MS-Word which contains the following:
  - Your student number
  - The module code
  - All answers required, including typed answers, diagrams and screenshots
  - The ***URL of the Web App*** that you developed
- The document name must follow the format shown here:
  - ***StudentNumber_ModuleCode_Part#.***
  - E.g., if your student number is *12345* and you are submitting *Part 1* of the POE for the module *PROG121*, create a document named ***12345_Prog121_Part1.***
- Submit this document in Learn, using the submission link on the Learn page for this module.

Summary Sheet

ITEM	DESCRIPTION
Summary of Activities	The student needs to submit each part of the POE on the Learn/LMS page for this module. ***NB. Please follow the given instructions to supply a document which includes the needed answers, screenshots, the URL of the Web App module developed; and the link to the GitHub repository containing your project source code.***
Tools and Resources	• Microsoft Visual Studio; • Microsoft SQL Server; • Microsoft Word or other word processing software; • Windows Azure Portal; • Windows Azure subscription with Microsoft Azure Storage; • A GitHub repository
Calculation of Marks	This POE consists of 3 parts. The mark for each part of the POE will be calculated as a mark out of 100 (i.e. a percentage). The final module mark will be weighted as follows: • POE Part 1 – 25% (formative) • POE Part 2 – 30% (formative) • ICE Tasks – 10% • Part 3 – 35% (summative)

POE Part 1 — Azure Storage Solution (Marks: 100)

Related Content: Learning Units: 1 – 3

Assessment

Assessment/ Deliverable	Marks	Weight	Duration
POE Part 1	100	25%	15 hours

Your submission document

Your submission for this Part of the POE must be submitted in an MS-Word document, containing the following:

- Your student number
- The module code
- The URL of your deployed application
- The GitHub link for the web application source code
- Screenshots showing your successful implementation of the functionalities as described below, as well as screenshots of the deployed web application

Note: *Make sure you read the instructions given earlier in this document and follow the specified file name format.*

Develop an application which makes use of various Azure Storage Services.

You are required to develop a web application with the following capabilities:

- Store customer profiles and product related information using Azure Tables.
- Host images and multimedia content using Azure Blob Storage.
- Details relating to processing of orders and inventory management should be stored in Azure Queues. An example would be Uploading image “imageName”, “Processing order”, etc.
- Lastly, contracts, and log files should be stored using Azure Files.

In your Azure services, you are required keep in mind scalability, reliability, and cost-effectiveness. In your web applications, you are required to use the relevant controls to upload or download, and displaying the data stored in your Azure Storage Services.

Once you have tested your web application, you are required to deploy it to an Azure App Service and make it accessible through a link. Ensure that this has been tested both on your local computer and on the App Service.

Submitting your document for this part of the POE

You are required to submit a single MS-Word document with the following:

- Screenshots of your various storage services, with at least 5 records each, as well as screenshots of the deployed web application
- The URL for your deployed Web Application
    - The URL should follow the following format and must look similar to this: **http://student_number.azurewebsites.net**
- The GitHub link for the web application source code

Once you have completed your submission doc for this Part of the POE, submit your document using the submission link on the Learn page for this module.

Note: *Make sure you read the instructions given earlier in this document and follow the specified file name format.*

Rubric 1 (for POE Part 1)					Comments
	Excellent	Good	Developing	Poor	
Able to store information successfully into a Table Storage using the appropriate controls in a web application. • Screenshots showing at least 5 records are provided.	16 – 20	11 – 15	6 – 10	0 - 5	
Multimedia information is successfully stored in a Blob Storage, using the appropriate web application controls. • Screenshots showing at least 5 records are provided.	16 – 20	11 - 15	6 – 10	0 - 5	
Queues have been used to store transaction and inventory process using the correct format. • Screenshots showing at least 5 records are provided.	16 – 20	11 - 15	6 – 10	0 - 5	
Files and documents have been stored in an Azure File service using their file names. • Screenshots showing at least 5 records are provided.	16 – 20	11 - 15	6 – 10	0 - 5	

The web application is deployed to an Azure App Service and runs correctly in the online environment. • Screenshots of the Azure deployment process are provided. • URL is provided and accessible in a web browser.	16 – 20	11 - 15	6 – 10	0 - 5	
POE Part 1 Subtotal					**/100**

POE Part 2 — Integrating more Azure Services into your application (Marks: 100)

Related Content: Learning Units: 4 – 6

Assessment

Assessment/Deliverable	Marks	Weight	Duration
POE Part 2	100	30%	15 hours

Your submission document

Your submission for this Part of the POE must be submitted in an MS-Word document, containing the following:

- Your student number
- The module code
- The URL of your deployed application
- The GitHub link for the web application source code
- Screenshots showing your successful implementation of the functionalities as described below, as well as screenshots of the deployed web application
- Written answers for discussion questions

Note: *Make sure you read the instructions given earlier in this document and follow the specified file name format.*

A. Integrating Functions to build robust application architecture

You are required to integrate four functions into your code to enhance the scalability, cost-effectiveness and cloud suitability. The four functions will call the services used in POE Part 1:

- Store information into Azure tables
- Write to Blob Storage
- A queue is written to/from for transaction information
- Write to Azure files

B. Using services for improving the customer experience

Discuss how the following services could add value to the customer experience in your app:

- Azure Event hubs
- Azure Event bus

Submitting your document for this part of the POE

Once you have completed your submission doc containing the answers to all the questions above, submit your document using the submission link on the Learn page for this module.

Notes:

- Your solution for Part 2 must incorporate all the requirements from Part 1 and Part 2.
- Make sure you read the instructions given earlier in this document and follow the specified file name format.

Rubric 2 (for POE Part 2)					Comments
	Excellent	Good	Developing	Poor	
Create a function that stores information into Azure tables • Screenshots of function on Azure function app and code shared.	16 – 20	11 – 15	6 – 10	0 - 5	
Create a function that writes to Azure blob storage • Screenshots of function on Azure function app and code shared.	16 – 20	11 – 15	6 – 10	0 - 5	
Create a function that reads from/writes to Azure queue • Screenshots of function on Azure function app and code shared. • Screenshot of message in the queue	16 – 20	11 - 15	6 – 10	0 - 5	
Create a function that sends a file to Azure files • Screenshots of function on Azure function app and code shared. • Screenshot of file in Azure files	16 – 20	11 – 15	6 – 10	0 - 5	
• Discussed the 2 services under the following headings: o Description of service o Mechanism o How it adds value to end users	16 – 20	11 - 15	6 – 10	0 - 5	
POE Part 2 Subtotal					**/100**

POE Part 3 — Analyse your scenario for an appropriate cloud solution (Marks: 100)

Related Content: Learning Units: 7 – 8

Assessment

Assessment/ Deliverable	Marks	Weight	Duration
POE Part 3 (Summative)	100	35%	15 hours

Your solution for Parts 1 and 2 seeks to solve a problem for storing products for an online store. Various Azure Services were utilised to achieve this goal, including Azure Storage, and Azure Service Bus. Part 3 of your POE builds on the work you completed in Parts 1 and 2, and you should make improvements to your existing solution based on the feedback you've received from your lecturer. Part 3 is the final summative assessment submission for this module.

Your submission document

Your submission for this Part of the POE must be submitted in an MS-Word document, containing the following:

- Your student number
- The module code
- The URL of your deployed application
- The GitHub link for the web application source code
- Screenshots showing your successful implementation of the functionalities as described below, as well as screenshots of the deployed web application
- Written answers where required for the questions below

Note: *Make sure you read the instructions given earlier in this document and follow the specified file name format.*

A. Create an Azure SQL database

To ensure that your web application uses centralised data storage and allows for analysis of data, you are required to create an Azure SQL database:

- The database must store customer information, product information, and order information.
- You are also required to create a replica of your database to a different region, and to provide a written motivation as to why a replica database would be necessary.
- Provide screenshots of the process for creating your Azure SQL database, as well as screenshots for creating a replica of your database.

B. Document the technology choices for your solution

Create a comprehensive report where you document all of the Azure Services that you utilised in your solution. You must describe all the component, services, technology choices and hosting models used in developing your solution. Provide your written report in the form of a table which includes the columns listed below:

- Component e.g., Azure SQL database
- Technology choice (e.g. compute or data storage, etc)
- Hosting model (e.g., PAAS, etc)

C. Motivate the Azure Services used for each application functionality

Once you have created your report for Question B where you described the technology choices made when developing your solution, you are required to describe and motivate these services as they relate to the application requirements.

- For each of the Azure Services you included, clearly identify the specific requirements in your application for which you used the Azure Service.
- For each application requirement identified, motivate why the Azure Service used was well suited for the task included in your application.
- For this question you must identify at least 6 specific application requirements, and provide motivations as to why the Azure Service you used was well suited to implanting the solution for that requirement.

D. Identify alternative Azure technologies

Once you have created your report for Question C where you motivate why you used certain Azure Services for each application requirement, you are required to identify different Azure services which would be well suited alternative options for the various tasks included in your application.

- In your answer, make sure that you identify specific requirements in your application, identify alternative Azure Services that would have been suitable for each requirement, and motivate why the alternative Azure Service would be a viable alternative to use.
- For this question you must identify alternative Azure Services for at least 4 requirements in your application.

Submitting your document for this part of the POE

Once you have completed your submission doc containing the answers to all the questions above, submit your document using the submission link on the Learn page for this module.

Notes:

- Your solution for Part 3 must incorporate all the requirements from Parts 1 to 3.
- Make sure you read the instructions given earlier in this document and follow the specified file name format.

Rubric 3 (for POE Part 3)					Comments
	Excellent	**Good**	**Developing**	**Poor**	
An **Azure SQL database** has been implemented with the following: • The DB stores customer information, product information, and order information. • A **replica** of the database was created for a different region, and a motivation is provided for creating a replica • Screenshots for the Azure SQL database and the replica database.	16 – 20	11 - 15	6 – 10	0 - 5	
The web application is **deployed** to an Azure App Service and runs correctly in the online environment. The web application incorporates the functionality as specified in POE Parts 1, 2 and 3. • Lecturer feedback has been addressed • Screenshots of the Azure deployment process are provided. • URL is provided and accessible in a web browser.	16 – 20	11 - 15	6 – 10	0 - 5	

A comprehensive report documents the **technology choices** for the web application • All components are correctly identified in the table • Each row lists a different component, with an explanation of the services, technology choices and hosting models for each	16 – 20	11 - 15	6 – 10	0 - 5	
Clear and convincing motivation for the **Azure Services used** in the web application and their suitability to meet the application requirements. • At least 6 specific application requirements are listed • For each application requirement a detailed motivation is provided for the Azure Service that was used • It is clear from the motivations why the chosen Azure Services were valid choices for implementing the web application	16 – 20	11 - 15	6 – 10	0 - 5	
Clear and convincing motivation for **alternative Azure Services** and why they would be viable alternatives to meet the web application requirements. • Viable alternatives are identified for at least 4 specific application requirements • For each application requirement a detailed motivation is provided to show why the	16 – 20	11 – 15	6 – 10	0 - 5	

alternative Azure Service would be a viable option • It is clear from the motivation why the alternative Azure Services were selected and why they could have been valid choices					
POE Part 3 Subtotal					**/100**