

ICTPRG443 Apply intermediate programming skills in different languages

ICTPRG554 Manage data persistence using noSQL data stores

Learner version

# Server-side Web Programming Assessment 2

Portfolio

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Learner version

# Server-side Web Programming Assessment 2

Portfolio

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| Section A – Program/course details | |
| **Qualification code: ICT50220** | **Qualification title:** Diploma of Information Technology (Front End Web Development) with Diploma of Information Technology (Back End Web Development) |
| **Unit code:**  **DWEB6 – Server-side Web Programming**  **ICTPRG443**  **ICTPRG554** | **Unit title:**  Apply intermediate programming skills in different languages  Manage data persistence using noSQL data stores |
| **Pre/co-requisites:** N/A | |
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| Section B – Assessment task details | | | |
| **Assessment number: 2** of 2 | **Semester/year:** 2/2025 | | **Due date:** Session 16 |
| **Duration of assessment: 12** hours | | **Assessment task results:** This assessment task will be marked as:  Ungraded result: satisfactory or not yet satisfactory | |
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| Section C – Instructions to learners |
| Portfolio task  For this assessment task you will be required to plan and develop a full stack application that involves a front-end client which passes data to and from a back-end server RESTful API, which stores data within a noSQL database. The scripts will need to demonstrate introductory object orientated programming techniques.  This project has been divided into 6 key parts. Each part must be completed as per the instructions.  Part 1 – Confirm Application Requirements  Part 2 – Plan & Develop the React.js Client (**Milestone**)  Part 3 – Design the Database  Part 4 – Develop RESTful API Server  Part 5 – Refine the Client and Server  Part 6 – Test and Debug the Code  Part 7 – Document Activities & Hand Over  **REFER TO THE SUPPORTING DOCUMENTATION FOR FUTHER ASSESSMENT DETAILS** |
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| Section D – Conditions for assessment |
| ****Unit application:****   * This is an individual task. * You must meet all criteria listed in the marking guide to be satisfactory in this task. * You must submit all required working files, documentation, and any other assets that you feel may be required in a zipped file, including the completed and signed coversheet. The assessment must be completed and submitted electronically to Brightspace by the due date. If this is not possible, you must contact your assessor to gain written approval for an alternative arrangement for submitting the assessment. * If not successful within the enrolment period as per Holmesglen assessment procedure, you will be requested to resubmit within 7 days of receiving feedback. You will have the opportunity to resubmit if any part of the assessment is deemed unsatisfactory (you are permitted TWO (2) resubmission per assessment task). Resubmissions must be submitted by the resubmission due date provided by your teacher. * This task is open book. You may use the internet for research purposes only. All answers must be in your own words. Where a quote is used, you must cite the information source. * If you feel you require special allowance or adjustment to this task, please discuss with your assessor within one week of commencing this assessment. Any change to assessment arrangements must be reviewed by the Education Manager and approved by the Head of Department. * You can appeal an assessment decision according to the Holmesglen Assessment Complaints and Appeals Procedure. * You are expected to dedicate time to develop this assessment task both in and out of the classroom. * Leaner must contribute to and abide by organisational standards including intellectual property, privacy laws, and plagiarism and academic honesty. Further information is detailed at: https://holmesglen.edu.au/Students/Student-Resources/ |
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| Equipment/resources learners must supply: | Equipment/resources to be provided by the RTO: |
| * A MAC or * PC/laptop with the following minimum specification: * Quad-Core CPU, 16GB of RAM, 250GB of Storage, 2 GHz or faster processor * Windows 10 OS, or higher * Headset with microphone and webcam (if learning remotely) * Internet access * Access to applications used in learning is available through Holmesglen MyHorizon or can be downloaded via the link provided: * Brightspace (Learning Management System) - https://holmesglen.brightspace.com/ * 365 Microsoft office suite - https://portal.office.com * WebEx - https://holmesglen.webex.com/ * Holmesglen OneDrive * Google Chrome – recommended web browser https://www.google.com/intl/en\_au/chrome/ * 7-Zip - https://www.7-zip.org/download.html * GitHub Desktop- https://desktop.github.com * Visual Studio Code - https://code.visualstudio.com/ | * Classroom computer with the following minimum specification: Quad-Core CPU, 16GB of RAM, 250GB of Storage, 4 GHz or faster processor Internet access * Access to applications used in learning is available at ZENworks and Holmesglen MyHorizon: * Brightspace (Learning Management System) * 365 Microsoft office suite * WebEx * Holmesglen OneDrive * Google Chrome – recommended web browser * 7Zip * GitHub Desktop * Visual Studio Code |

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| Section E – Assessment questions/criteria | | |
| **Assessment number:** 2 | | **Assessment title:** Portfolio |
| **Unit code:**  **DWEB6 – Server-side Web Programming**  **ICTPRG443**  **ICTPRG554** | **Unit title:**  Apply intermediate programming skills in different languages  Manage data persistence using noSQL data stores | |
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**PORTFOLIO TASK**

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| Criteria for assessment | SatisfactoryYes No | | Comment |
| **The following has been submitted for assessment:** | | | |
| Assessment Sheet (signed & fully completed) |  |  |  |
| Portfolio website (zipped & to specifications) |  |  |  |
| **Marking Criteria (for each product document/s supplied):** | | | |
| **Part 1 – Confirm Application Requirements**  Assessment Documentation | | | |
| 1. Learner has reviewed the user requirements in the brief and Identified the core functionality needed for the development of the project |  |  |  |
| 1. Learner has confirmed the core pages required by the user |  |  |  |
| 1. Learner has confirmed all relevant technologies required for the application |  |  |  |
| 1. Learner has confirmed the “type” of database being used |  |  |  |
| 1. Learner has confirmed the primary scripting language used by the server to allow for dynamic functionality. |  |  |  |
| 1. In accordance with brief requirements, learner has confirmed that a private cloud repository has been created in GitHub as backup |  |  |  |
| 1. The learner:    * has reviewed the user requirements and needs of the project    * has determined the pages needed and dynamic functionality    * has determined appropriate language & technologies based on required functionality    * has obtained approval from the client about the pages required and the functionality |  |  |  |
| **Part 2 – Plan & Develop the React.js Client**  Assessment Documentation | | | |
| 1. Learner has developed the hierarchy / sitemap of the content to be displayed on the website according to the user requirements |  |  |  |
| 1. Learner has created the prototype UI using wireframes for the website’s home page to show content layout |  |  |  |
| 1. Learner has built the website navigation system with the routed page links as specified by the brief requirements |  |  |  |
| 1. Learner has built the page as specified in their wireframe |  |  |  |
| 1. The application contains functioning routing to functioning pages as specified in the user brief requirements |  |  |  |
| 1. The learner has applied basic language syntax rules, including use of JSX, and best practices to structure their React.js code, including initialisation & destruction of component state |  |  |  |
| 1. In accordance with the project brief, the learner has used CSS techniques to style, layout and position the document elements of webpages on the website |  |  |  |
| 1. State has been used to Create, manipulate and destroy dynamic variables, including data structures. |  |  |  |
| **Part 3 – Design the Database**  Assessment Documentation | | | |
| 1. Learner has confirmed the specific noSQL database being used |  |  |  |
| 1. Provided brief descriptions on the concepts of “horizontal scaling” and “vertical scaling” AND describe at least ONE benefit of preferring horizontal scaling databases than to vertical scaled databases |  |  |  |
| 1. Learner has compared the SQL with noSQL databases to the competency specified |  |  |  |
| 1. Listed the different data types required used by the noSQL database in your application & confirmed overall data structure of your database through use of Firestore database design diagram |  |  |  |
| 1. Learner has confirmed the TWO areas in your database where raw data is stored |  |  |  |
| 1. Created a database partition, provided a screenshot the database that includes the different partition “keys” and determine whether it is a “partition” or a “shard” |  |  |  |
| 1. Commented on the estimated distribution of data between the partitions |  |  |  |
| 1. Learner has confirmed approval of database design & supporting documentation with assessor |  |  |  |
| **Part 4 – Develop RESTful API Server**  Assessment Documentation | | | |
| 1. Confirmed the server-side API runtime environment which interacts with the application’s noSQL database |  |  |  |
| 1. Created the entry point for the routes in the API server |  |  |  |
| 1. Created the file that handles the initial noSQL database connection |  |  |  |
| 1. Created the file(s) that handle at least ONE of each CRUD operation in the application |  |  |  |
| 1. Created the file(s) that handle/”controls” the route requests and query the database as required for each CRUD operation |  |  |  |
| 1. Learner confirmed CRUD operations & queries are working as intended as follows: |  |  |  |
| the GUI of the page that handles a GET request, and the successful Postman result for a GET request at the endpoint used. |  |  |  |
| the GUI of the page that handles a POST request, and the successful Postman result for a POST request at the endpoint used. |  |  |  |
| the GUI of the page that handles a PUT request, and the successful Postman result for a PUT request at the endpoint used. |  |  |  |
| the GUI of the page that handles a DELETE request, and the successful Postman result for a DELETE request at the endpoint used. |  |  |  |
| the GUI of the page that handles a GET By ID request, and the successful Postman result for a GET By ID request at the endpoint used. |  |  |  |
| 1. Learner has confirmed approval of RESTful API & supporting documentation with assessor |  |  |  |
| **Part 5 – Refine the Client and Server**  Assessment Documentation | | | |
| 1. Incorporated at least ONE sort key into a query made to the noSQL database and provide a screenshot of the code |  |  |  |
| 1. Provided TWO screenshot of a Morgan output that details the through-put for TWO CRUD request. (One Read & One Write request) |  |  |  |
| 1. Listed at least TWO methods in which we have or can optimise the through-put of the queries to database |  |  |  |
| 1. Created at least TWO composite indexes to optimise queries made to the selected noSQL database |  |  |  |
| 1. Described the function of each index created above and how they optimise the queries to the database |  |  |  |
| 1. Perform a query against at least ONE of the newly created index and provide a screenshot of both (i) the code of the index query, and (ii) the change to the GUI page based on the altered query |  |  |  |
| 1. Implemented the file(s) which handle authentication, authorisation and one admin level of authorisation for the server-side API |  |  |  |
| 1. Created the file(s) which encrypt relevant authentication data and stated the technology used to encrypt the data |  |  |  |
| 1. Learner confirmed ONE technology used in the application to secure the API’s authorisation / authentication processes describe its function |  |  |  |
| 1. Learner has configured the Time-To-Live (TTL) for the objects created by the “auth” technology and explained how TTL has been adjusted |  |  |  |
| 1. Stated ONE technology used to configure the server software to minimize potential database attacks and describe its function |  |  |  |
| 1. Implemented the file(s) that handle data validation for at least ONE route and confirmed the technology used. |  |  |  |
| 1. Learner has refined the client & server structures in accordance with the project brief & reviewed these structures with the assessor |  |  |  |
| **Part 6 – Test and Debug the Code**  Assessment Documentation | | | |
| 1. Listed at least TWO debugging tools, ONE of which must be a “standalone” tool |  |  |  |
| 1. Tested the client, server and database outputs and security and record the results for the following six tests: 2. **Test**: That each CRUD operation renders the expected output at a specified route which contains all CRUD operations 3. **Test**: That a 404 Error Page displays when a user navigates to an undefined route and the error stack is provided to the developer in terminal 4. **Test**: Test that the JWT is persistent for the session when users a logged in 5. **Test**: Test that a GET route, with dynamically retrieved data, loads and renders correctly in at least TWO different browsers (confirm which browsers tested) 6. **Test**: Test that a POST route, which accepts a number, has been converted to the correct number type in the database. 7. **Test**: Test that the logout function removes the user from local storage along with the user token 8. **Test**: Designed Test 7 |  |  |  |
| 1. Learner has finalised testing & debugging of the web application, and has reviewed test completion with the assessor |  |  |  |
| **Part 7 – Document Activities & Hand Over**  Assessment Documentation | | | |
| 1. The learner has diagnosed bugs or potential bugs and identify resolution requirements. |  |  |  |
| 1. The Client and Server have been designed and implemented according to the user brief requirements |  |  |  |
| 1. The project has been created using an integrated development environment (IDE) that meets the needs of the brief |  |  |  |
| 1. The project has been tested, debugged and documented according to user requirements and expected outcomes |  |  |  |
| 1. Confirm that the final version of the project has been transferred to GitHub as a private repository and provide ONE screenshot of the complete private “repo” in the browser |  |  |  |
| 1. The learner has sought to improve protocols governing communications with the “client” and co-workers during the length of the project |  |  |  |
| 1. The learner has collaborated with others, sharing information to build strong work groups and interactions with the “client” |  |  |  |

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| Learner Acknowledgement and Cover Sheet | |
| **Academic Declaration:**  By submitting this assessment task and signing the below, I acknowledge and agree that:   1. This completed assessment task is my own work. 2. I understand the serious nature of plagiarism and I am aware of the penalties that exist for breaching this. 3. I have kept a copy of this assessment task. 4. The assessor may provide a copy of this assessment task to another member of the Institute for validation and/or benchmarking purposes. 5. For electronic submissions, by typing your name in the student signature field, you are accepting this declaration. | |
| **Learner name:** Insert name | **Learner ID:** Insert ID |
| **Submission Date:** Insert date | |
| **Learner signature:** | |
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| Section F – Feedback to Learner |
| **Has the learner successfully completed this assessment task?** Yes No |
| **Assessor feedback (as appropriate):** Insert feedback |
| **Resubmission allowed:** Yes No  **Resubmission due date:** Insert date |
| **Assessor name:** Insert name |
| **Assessor signature:** |
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| **Project Brief** Read through the brief below take note of the needs and requirements outlined in the brief. |
| **Overview of project**  For this assessment task you will be required to plan and develop a full stack application that involves a front-end client which passes data to and from a back-end server RESTful API, which stores data within a noSQL database. The scripts will need to demonstrate introductory object orientated programming techniques.  **NOTE**: *If you would like to create a full-stack application* ***that is NOT a mock “e-commerce shop” website****, please discuss with your facilitator in advance to determine suitability.*  **This assessment task is divided into the following parts:** Part 1 – Confirm Application Requirements  Part 2 – Plan & Develop the React.js Client (**Milestone**) Part 3 – Design the Database  Part 4 – Develop RESTful API Server Part 5 – Refine the Client and Server Part 6 – Test and Debug the Code Part 7 – Document Activities & Hand Over  **Client Scenario**  You are a freelancer website developer and have been recently engaged by Timbertop United Pty Ltd (“TU”) to build a full-stack website prototype for their football club’s e-commerce shop web application*.* TU plans to launch the new venture late into Quarter 2 of FY2023, to hit markets just before the Christmas rush.  Broadly, TU would like the front-end UI to be built using React.js in order to allow for modular design and to allow for future iteration following their usual Agile development processes. Importantly, TU expects you to build a RESTful API server that saves and stores data in a noSQL database, as it expects to store large amounts of data on user information & currencies.  They have summarised the specific features and requirements as follows:  **General Client Features**   * The Client Application returns RESTful API data to be displayed in the GUI **to at least TWO endpoints** * As the website is a prototype, **a minimum of at least FOUR routed pages** (using react-router-dom), including at least TWO dynamic pages * Use class-based components and stateless functional components * Displaying of data is to use appropriate controls, such as text boxes, dropdowns, radio buttons and so on * Format the data so it is easily understood by the user * Structuring of data (*such as using TypeScript or JavaScript methods*) * Error pages must be designed and created * *Optional:* *The developer (you) may choose to build a search component that searches the client state OR search an API data endpoint and display dynamically in the browser* * **IMPORTANT**: You are **NOT** required to build complete integrated e-commerce solution. Integrations such as payment processing & checkout completion & processing are **NOT** required.   **General API Requirements**   * A RESTful API that returns JSON at various endpoints * The RESTful API data must be saved and retrieved from a noSQL database (Google Firestore) * All 4 CRUD operations must be used in your application * At least ONE POST route and ONE PUT route must be validated using a module such as JOI * Authentication and authorisation must be implemented * At least ONE endpoint must be secured such as an admin endpoint * Structuring of data (*such as using TypeScript or JavaScript methods*) * Error pages or responses, such as 404 / 500 errors, must be created and implemented   **Database Requirements**   * The database must have at least TWO collections (*for example “users” & “products”*) * The database must use at least THREE different data types * The database must incorporate TWO composite indexes and query at least ONE of them * The database must utilise at least ONE sort key to refine the query * Images must be stored in a separate partition to the standard data types   **Security Requirements**   * At least ONE POST route and ONE PUT route must be validated before saving to the database * Authentication and authorisation must take place before any data is saved to the database * Application secrets must be stored in environmental variables or using a module such as DOTENV * It is recommended that a module such as HELMET be used to improve protection of the application and database * Tests must be conducted (*in accordance with Part 6*) to ensure no unnecessary sensitive data is returned from an endpoint * Query responses should be tracked and monitored using a module such as MORGAN * Appropriate error messages must be returned and without error stack traces   **Required Language Standards, Third-Party Libraries & Technologies**   * Mandatory   + HTML5, CSS3 & JSX languages to be used for client-side development   + React.js as a client framework **using Vite**   + The GUI must interact with at least TWO of the RESTful APIs endpoints   + Node.js (with JavaScript) with Express must be used for server-side API development   + Google Firestore should be used as the NoSQL database   + Use of a CSS-in-JS library, such as vanilla-extract or styled-components * Optional   + Use of a responsive component library like Bootstrap or unstyled/primitives component library like RadixUI   **Coding Standards**   * All code should be commented clearly:   + **Classes and Modules** - A descriptive overview should be provided for each class / script as a comment at the top of the file. Details about any parent classes should be documented at the top of the file.   + **Members** -The purpose of each member should be documented as a comment.   + **Methods** -The purpose of each method should be documented as a comment.   + **Parameters** - The purpose of each parameter should be documented as a comment. * XHTML Standards must be adhered to wherever possible. * CSS Standards must be adhered to wherever possible. * XHTML and HTML accessibility standards |

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| **Part 1 - Confirm Application Requirements** Based on the information you have gathered from the brief complete the following: | | | | | | |
| **Question / Criteria** | | | **Answer / Satisfactory Response** | | | |
| 1. Review the user requirements *in the brief above* and confirm:  * the **purpose** of the web application, * the required **features / technologies**; and * any relevant **standards**,needed for the development of the project. | | | **Purpose of web application** | | | |
| *< State answer here >* | | | |
| **List of Required Features / Technologies** | | | |
| *< List answers here >* | | | |
| **Relevant Standards** | | | |
| *< List answers here >* | | | |
| 1. Confirm the core pages / views required by the user in the application and highlight at least ONE page(s) which will be fed dynamic data | | | *< List all routed website pages with ONE dynamic page highlighted >* | | | |
| 1. Confirm the FOUR relevant technologies required for the application, as per a typical “MERN Stack” (*or rather “FERN Stack”*) application | | | *< List the FOUR technologies that make up the full stack application>* | | | |
| 1. Confirm the “type” of database being used in the application stack | | | *< State the name of the database >* | | | |
| 1. Confirm the primary programming language used by the server to allow for dynamic functionality | | | *< State the name of the of server programming language >* | | | |
| 1. In accordance with brief requirements, confirm that a private cloud repository has been created in GitHub, to allow for backup transfers during project development   (*Provide ONE screenshot of GitHub “repo”)* | | | *< Screenshot of GitHub repo >* | | | |
| **7. Approval and Feedback** After you have finished the planning, obtain approval from the assessor to confirm the user requirements | | | | | | |
| **Checklist (To be completed by the learner’s facilitator)** | | | | | **Yes** | **No** |
| The learner has reviewed the user requirements and needs of the project | | | | | ☐ | ☐ |
| The learner has determined the pages needed and dynamic functionality | | | | | ☐ | ☐ |
| The learner has determined appropriate language & technologies based on required functionality | | | | | ☐ | ☐ |
| The learner has obtained approval from the client about the pages required and the functionality | | | | | ☐ | ☐ |
| **Assessor Name** | *Alex Bicknell* | **Assessor Signature** | *Signature* | **Date** | *Insert date* | |

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| **Part 2 - Plan & Develop the React.js Client** Based on the information you have gathered from the brief complete the following: | | | | | | |
| **Question / Criteria** | | | **Answer / Satisfactory Response** | | | |
| 1. Learner has developed the hierarchy / sitemap of the content to be displayed on the website according to the user requirements   (*Provide ONE image / screenshot of sitemap*) | | | *< Screenshot / image of site map >* | | | |
| 1. Learner has designed the overall UI of the website using wireframes for the website’s home page to show content layout   (*Provide ONE image of wireframe for Home page*) | | | *< Wireframe of Home page >* | | | |
| 1. The learner has built the website navigation system with the routed page links as specified by the brief requirements     (*Provide ONE screenshot of Navigation Bar*) | | | *< Screenshot of Navigation Bar >* | | | |
| 1. The learner has built all required pages as specified in their wireframe & in **Part 1**.   ***NOTE****: Pages planned to render dynamic data are to be presented with mock/dummy static data* ***for this Part 2****.*  (*Provide* ***ONE*** *screenshot of the complete home page*) | | | *< Screenshot of Home page >* | | | |
| 1. The application contains functioning routing to functioning pages as specified in the user brief requirements & below.   (*Provide* ***ONE*** *screenshot* ***each*** *of* ***THREE*** *functioning non-home pages, such as “Products” or “Product” pages*) | | | *< Screenshots of* ***THREE*** *Routed Non-Home pages >* | | | |
| **FRONT-END “STATIC” REACT CLIENT – DUE SESSION 10** | | | | | | |
| **Build “Static” React.js Front-End**  The React client must have the following framework & UI specifications:   * React.js front-end client built using Vite * CSS-in-JS solution integrated with the React application (*recommended: vanilla-extract*) * App.jsx setup as a routed file using react-router-dom * Demo Home page AND **at least THREE** **(3)** other routed pages including Register, Login & NotFound pages.   At this point, it is strongly recommended you further complete:   * Register & Login forms are integrated with API & functional * Demo Dashboard with functional client-side private routes * Central theming & root CSS variables using vanilla-extract | | | | | | |
| **Approval and Feedback** After you have finished planning the frontend design, obtain approval from the assessor | | | | | | |
| **Checklist (To be completed by the learner’s facilitator)** | | | | | **Yes** | **No** |
| 1. The learner has applied basic language syntax rules, including use of JSX, and best practices to structure their React.js code, including initialisation & destruction of component state | | | | | ☐ | ☐ |
| 1. In accordance with the project brief, the learner has used CSS techniques to style, layout and position the document elements of webpages in the website | | | | | ☐ | ☐ |
| 1. The learner has used state to create, manipulate and destroy dynamic variables, including data structures (*such as React.js states*). | | | | | ☐ | ☐ |
| **Assessor Name** | *Alex Bicknell* | **Assessor Signature** | *Signature* | **Date** | *Insert date* | |

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| **Part 3 - Design the Database** Based on the information you have gathered from the brief complete the following: | | | | | | |
| **Question / Criteria** | | | **Answer / Satisfactory Response** | | | |
| 1. Confirm the specific noSQL database being used in the project | | | *< Confirm the name of the database >* | | | |
| 1. Provide the following:  * Brief descriptions on the concepts of “horizontal scaling” and “vertical scaling”; and   (*at least ONE sentence each*)   * Describe at least ONE benefit of preferring horizontal scaling databases than to vertical scaled databases | | | *< Description on scaling types>*  *<Benefits of horizontal scaling >*  *.* | | | |
| 1. Compare the SQL with noSQL databases as follows:  * List ONE example of a database for each type; * Confirm which database types are “relational” or “non-relational” and what is meant by each concept; and * Confirm which form(s) of scaling can be utilised by each type | | | *< Description of SQL/noSQL databases>*  *<Relational/non-relational distinction>*  *<Which scaling is used for SQL and noSQL>* | | | |
| 1. List the different data types (**at least THREE**) required used by your selected noSQL database in your application.   Confirm the overall data structure of your database by providing a Firestore database design diagram. | | | *< List of applicable Firestore database data types >* | | | |
| 1. Confirm the TWO areas in your database where raw data is stored.   (*Provide ONE screenshot of* ***each*** *storage area with posted data in each*) | | | *< TWO screenshots of the TWO storage areas >* | | | |
| 1. Create a database partition, provide a screenshot the database that includes the different partition “keys” (*i.e. collection names*) and determine whether it is a “partition” or a “shard” | | | *< Screenshots of database partition showing partition key names (“collection name”) >* | | | |
| 1. Comment on the estimated distribution of data between the partitions (*i.e.* “*at least 40% of all application data is in # collection, etc.*”)   (*Minimum ONE sentence*) | | | *< Screenshots of database partition showing partition key names (“collection name”) >* | | | |
| **Approval and Feedback** After you have finished planning the database design, obtain approval from the assessor | | | | | | |
| **Checklist (To be completed by the learner’s facilitator)** | | | | | **Yes** | **No** |
| 8. Learner has confirmed approval of database design & supporting documentation with assessor | | | | | ☐ | ☐ |
| **Assessor Name** | *Alex Bicknell* | **Assessor Signature** | *Signature* | **Date** | *Insert date* | |

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| **Part 4 - Develop RESTful API Server** Based on the information you have gathered from the brief complete the following: | | | | | | | | |
| **Question / Criteria** | | | | **Answer / Satisfactory Response** | | | | |
| 1. Confirm the server-side API runtime environment which interacts with the application’s noSQL database | | | | *< Confirm the name of the API runtime environment >* | | | | |
|  | | | | **Complete / Not Complete** | **Location of files** | | | |
| 1. Create and state the entry point for the routes in the API server | | | | *Complete* | *< State location of entry point file – EG.filename.js >* | | | |
| 1. Create and state the file that handles the initial noSQL database connection | | | | *Complete* | *< State location of database connection file – EG.filename.js >* | | | |
| 1. Create and state the file(s) that handle at least ONE of each CRUD operation in the application | | | | *Complete* | *< State location of CRUD operation files – EG.filename.js >* | | | |
| 1. Create and state the file(s) that handle/”controls” the route requests and query the database as required for each CRUD operation | | | | *Complete* | *< State location of database query control file – EG.filename.js >* | | | |
| 1. To confirm CRUD operations & queries are working as intended, provide ONE screenshot each for:   (*TWO screenshots in total for each section*) | | | |  | | | | |
| 1. **Displaying a collection of dynamic data - GET Request** 2. the GUI of the page that handles a GET request, and; 3. the successful Postman result for a GET request at the endpoint used. | | | | *i. < Screenshot of GUI handling GET request >*  *ii. < Screenshot of Postman GET result >* | | | | |
| 1. **Submitting form data to API – POST request** 2. the GUI of the page that handles a POST request, and; 3. the successful Postman result for a POST request at the endpoint used. | | | | *i. < Screenshot of GUI handling POST request >*  *ii. < Screenshot of Postman POST result >* | | | | |
| 1. **Editing form data from API – PUT/UPDATE request** 2. the GUI of the page that handles a PUT request, and; 3. the successful Postman result for a PUT request at the endpoint used. | | | | *i. < Screenshot of GUI handling PUT request >*  *ii. < Screenshot of Postman PUT result* | | | | |
| 1. **Deleting form data from API – DELETE request** 2. the GUI of the page that handles a DELETE request, and; 3. the successful Postman result for a DELETE request at the endpoint used. | | | | *i. < Screenshot of GUI handling DELETE request >*  *ii. < Screenshot of Postman DELETE result >* | | | | |
| 1. **Displaying a specific set of dynamic data – GET by ID Request** 2. the GUI of the page that handles a GET By ID request, and; 3. the successful Postman result for a GET By ID request at the endpoint used. | | | | *i. < Screenshot of GUI handling GET By ID request >*  *ii. < Screenshot of Postman GET by ID result >* | | | | |
| **Approval and Feedback** After you have finished planning the API design, obtain approval from the assessor | | | | | | | | |
| **Checklist (To be completed by the learner’s facilitator)** | | | | | | | **Yes** | **No** |
| 7. Learner has confirmed approval of RESTful API & supporting documentation with assessor | | | | | | | ☐ | ☐ |
| **Assessor Name** | *Alex Bicknell* | **Assessor Signature** | *Signature* | | | **Date** | *Insert date* | |

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| **Part 5 - Refine the Client and Server** Based on the information you have gathered from the brief complete the following: | | | | | | |
| **Question / Criteria** | | | **Answer / Satisfactory Response** | | | |
| 1. Incorporate at least ONE sort of key into a query made to the noSQL database and provide ONE screenshot of the code | | | *< Screenshot of Sort Key query >* | | | |
| 1. Provide TWO screenshots of a Morgan terminal output that details the through-put for TWO CRUD requests (*ONE* ***Read*** *& ONE* ***Write***) | | | *< Screenshot of Morgan terminal output >* | | | |
| 1. List at least TWO methods in which we have or can optimise the through-put of the query above | | | *< List of at least TWO methods that optimise queries >* | | | |
| 1. Create at least TWO composite indexes to optimise queries made to the selected noSQL database   (*Provide ONE screenshot of the created indexes*) | | | *< Screenshot of BOTH created indexes >* | | | |
| 1. Describe the function of each index created above and how they optimise the query(s) to the database   (*Minimum TWO sentences*) | | | *< Describe the how the two indexes function and optimise the queries >* | | | |
| 1. Perform a query against at least ONE of the newly created index and provide ONE screenshot of both: 2. the code of the index query; and 3. the change to the GUI page based on the altered query | | | *i. < Screenshot of code of index query >*  *ii. < Screenshot of changed GUI after index applied >* | | | |
| 1. Implement and state the file(s) which handle authentication, authorisation and one admin level of authorisation for the server-side API | | | *< Location of file handling authentication/authorisation – EG.filename.js >* | | | |
| 1. Create and state the file(s) which encrypt relevant authentication data and the technology used to encrypt the data | | | *< Location of file handling encryption – EG.filename.js >* | | | |
| 1. State ONE technology used in the application to secure the API’s authorisation / authentication processes and describe its function   (*Minimum ONE sentence*) | | | *< Name of technology >* | | | |
| 1. Configure the Time-To-Live (TTL) for the objects created by the “auth” technology above, provide ONE screenshot of the configured code and explain how TTL has been adjusted | | | *< Explanation of code that has been adjusted for TTL >*  *<* ***Screenshot*** *of TTL configuration >* | | | |
| 1. State ONE technology used to configure the server software to minimize potential database attacks and describe its function   (*Minimum ONE sentence*) | | | *< Name of technology >* | | | |
| 1. Implement and **state the file(s)** that handle data validation for at least ONE route and confirm the technology used.   Additionally, **include ONE (1) screenshot** of the code which shows how one of the policies structures the data | | | *< Location of file handling validation – EG.filename.js >*  *<* ***Screenshot*** *of the policy code structure example >* | | | |
| **Approval and Feedback** After you have finished planning the fullstack design, obtain approval from the assessor | | | | | | |
| **Checklist (To be completed by the learner’s facilitator)** | | | | | **Yes** | **No** |
| 13. Learner has refined the client & server structures in accordance with the project brief & reviewed these structures with the assessor | | | | | ☐ | ☐ |
| **Assessor Name** | *Alex Bicknell* | **Assessor Signature** | *Signature* | **Date** | *Insert date* | |

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| **Part 6 - Test and Debug the Code** Based on the information you have gathered from the brief complete the following: | | | | | | | | | | | |
| **Question / Criteria** | | | | | **Answer / Satisfactory Response** | | | | | | |
| 1. List at least TWO debugging tools, ONE of which must be a “standalone” tool | | | | | *< List of applicable debugging tools/methods >* | | | | | | |
| 1. Test the client, server and database outputs and security and record the results. Below you will need to **conduct at least SEVEN tests**, each providing the (i) test conducted, (ii) expected output of the test, (iii) success / failure and (iv) comments on test result and debugging.   **The first SIX tests to be conducted have been designed for you – you must design the SEVENTH test:** | | | | | | | | | | |
| **Test Design** | | **Expected Output** | | | **Correct Function** | | | **Comment on Test** | | |
| **Yes** | **No** | |
| 1. **Test:** That each CRUD operation renders the expected output at a specified route which contains all CRUD operations   (***Refer to P4 Q6***) | | *Expect currencies page to be dynamically populated with entries in the restaurant database collection (GET request)* | | |  |  | | < State whether the CRUD operations built for **P4 Question 6** are working as required > | | |
| 1. **Test:** That a 404 Error Page displays when a user navigates to an undefined route and the error stack is provided to the developer in terminal | | *Expect when user navigates to undefined route, to render the custom routed 404 page (see NotFound.jsx)* | | |  |  | | < Provide **screenshot** of rendered 404 Error webpage > | | |
| 1. **Test:** Test that the JWT is persistent for the session when users a logged in | | *Expect when logged in, to find the JWT token located in the request headers and for the JWT token to be valid* | | |  |  | | < Provide **screenshot** of JWT token saved to local storage in web browser > | | |
| 1. **Test:** Test that a GET route, with dynamically retrieved data, loads and renders correctly in at least **TWO** different browsers, as indicated | | *Expect that the Home page loads correctly in both Google Chrome and Firefox browsers* | | |  |  | | < Provide **screenshot** of webpage in Chrome >  < Provide **screenshot** of webpage in Firefox > | | |
| 1. **Test:** Test that a POST route, which accepts a number, has been converted to the correct number type in the database. | | *EG. Expect the “Rating” field in the “Add Currency” page to be listed as a number data type in Firebase collection* | | |  |  | | < Provide **screenshot** of Firestore database, confirming one dataset saved to a number type > | | |
| 1. **Test:** Test that the logout function removes the user from local storage along with the user token | | *EG. Expect the browsers local storage user data to be cleared and token removed* | | |  |  | | < Provide **screenshot** of JWT token in local storage set to falsy value on logout > | | |
| 1. **Test:** [*Design test 7 here – what feature/component are you trying to check works?*] | | < *Design custom expected output – what does success look like?* > | | |  |  | | < What happened when you tested the feature/component – did it match the expectation? > | | |
| **Approval and Feedback** After you have finished planning the testing & debugging process, obtain approval from the assessor | | | | | | | | | | | |
| **Checklist (To be completed by the learner’s facilitator)** | | | | | | | | | **Yes** | **No** | |
| 3. Learner has finalised testing & debugging of the web application, and has reviewed test completion with the assessor | | | | | | | | | ☐ | ☐ | |
| **Assessor Name** | *Alex Bicknell* | | **Assessor Signature** | *Signature* | | | **Date** | | *Insert date* | | |

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| **Part 7 - Document Activities & Hand Over** Based on the information you have gathered from the brief complete the following: | | | | | | | |
| **Skills to be observed during this task to the required standard.** Checklist (To be completed by the learner’s facilitator)The following tasks are to be completed in relation to the brief for this project. Each of the skills must be observed on at least one occasion. | | | | **Date 1** | | **Date 2** | |
| ##.##.2025 | | ##.##.2025 | |
| **Satisfactory** | | **Satisfactory** | |
| **Yes** | **No** | **Yes** | **No** |
| 1. The project has been built using maintainable code and internal documentation (in at least ONE file) according to organisational guidelines and coding standards | | | |  |  |  |  |
| 1. The Client and Server have been designed and implemented according to the user brief requirements | | | |  |  |  |  |
| 1. The project has been created using an integrated development environment (IDE) that meets the needs of the brief | | | |  |  |  |  |
| 1. The project has been tested, debugged and documented according to user requirements and expected outcomes | | | |  |  |  |  |
| 1. Confirm that the final version of the project has been transferred to GitHub as a private repository and provide ONE screenshot of the complete private “repo” in the browser | | | |  |  |  |  |
| 1. The learner has sought to improve protocols governing communications with the “client” and co-workers during the length of the project | | | |  |  |  |  |
| 1. The learner has collaborated with others, sharing information to build strong work groups and interactions with the “client” | | | |  |  |  |  |
| **Assessor Name** | *Alex Bicknell* | **Assessor Signature** | *Signature* | **Date** | | *Insert date* | |