

**Otago Boys’ High School**

**Kiwi Kars - Online Reservations**

**Assessment due date: Term 3, week 1 (Friday 24th October)**

**Credits: 12**

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| **Use complex programming techniques to develop a computer program (3.7)** | | |
| **Achievement** | **Merit** | **Excellence** |
| Use complex programming techniques to develop a computer program. | Use complex programming techniques to develop an informed computer program. | Use complex programming techniques to develop a refined computer program. |

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| **Use complex processes to develop a digital technologies outcome (3.8)** | | |
| **Achievement** | **Merit** | **Excellence** |
| Use complex processes to develop a digital technologies outcome. | Use complex processes to develop an informed digital technologies outcome. | Use complex processes to develop a refined digital technologies outcome. |

**Assessment Conditions: students can work collaboratively to discuss ideas and give one another feedback. However, they must code their program independently.**

**Use complex programming techniques to develop a computer program (3.7)**

**Use complex programming techniques to develop a computer program involves:**

* writing code for a program that performs a specified task
* using complex techniques in a suitable programming language
* setting out the program code clearly and documenting the program with comments
* testing and debugging the program to ensure that it works on a sample of expected cases.

**Use complex programming techniques to develop an informed computer program involves:**

* documenting the program with appropriate variable/module names and organised comments that describe code function and behaviour
* following conventions for the chosen programming language
* testing and debugging the program in an organised way to ensure that it works on a sample of both expected cases and relevant boundary cases.

**Use complex programming techniques to develop a refined computer program involves:**

* ensuring that the program is a well-structured, logical response to the task
* making the program flexible and robust
* comprehensively testing and debugging the program.

***Explanatory notes a complex computer program*:**

* uses variables storing at least two types of data (e.g. numeric, text, Boolean, object)
* uses sequence, selection and iteration control structures
* takes input from a user, file, sensors, or other external source
* produces output
* uses two or more complex programming techniques.

***Examples of complex programming techniques include:***

* programming or writing code for a graphical user interface (GUI)
* reading from, or writing to, files or other persistent storage
* object-oriented programming using class(es) and objects defined by the student
* using types defined by the student
* using third party or non-core API, library or framework
* using complex data structures (e.g. stacks, queues, trees).

**Use complex processes to develop a digital technologies outcome (3.8)**

**Use complex processes to develop a digital technologies outcome involves:**

* using recognised and appropriate project management tools and techniques to plan the development of a digital technologies outcome
* decomposing the digital technologies outcome into smaller components
* trialling components of the outcome
* testing that the digital technologies outcome functions as intended
* addressing relevant implications.

**Use complex processes to develop an informed digital technologies outcome involves:**

* effectively using project management tools and techniques to manage development, feedback and/or collaborative processes
* effectively trialling multiple components and/or techniques
* effectively using information from testing and trialling to improve the functionality of the digital technologies outcome.

**Use complex processes to develop a refined digital technologies outcome involves:**

* synthesising information gained from the planning, testing and trialling of components
* discussing how this information led to the development of a high-quality digital technologies outcome.

***Explanatory notes, examples of project management tools and techniques include:***

* Agile or waterfall techniques (Design Thinking)
* Kanban or scrum boards (Trello)
* version control software (v1 , v2 )
* collaboration tools (sharing via google docs)
* managing assets (correct folder structure and naming of image / files etc)

**The Client’s brief**

* You have been hired to create an online reservation form for a local Car Rental Business in Dunedin called Kiwi Kars**.** The owner (Clive) is hoping to expand his business and by creating an online reservation system he will gain more reservations. **The reservation form** will allow users to reserve a vehicle, Clive has supplied a car list and some images of the cars, along with some test data.
* Extra items a user can add to their reservation includes:
* Snow chains - $60
* Roof racks - $90
* Bike rack (fits max 3 bikes) - $120
* GPS - $35
* Child Booster Seat (9kg -36kg) - $50

**The total hire price is calculated by the vehicles price per day by the number of days the vehicle is hired for. You will need to add on a mandatory $20 per day insurance fee plus a one off standard booking fee of $50.**

* The reservations need to be stored in a real time database so that the manager can then approve bookings as they are created. The GUI must allow the program to book number of days (max 14 days) and their pick up date. Create a text area for the users to add any additional comments. The person booking the car must be older than 25 to make a reservation and their age must be also stored in the database.

The location of this new business is going to be 2 Arthur Street Dunedin and their contact phone number is 03 4775277 and email kiwikars@gmail.com

* They want you to design their colour palette/fonts and have provided 2 different logos and wish for the design to be modern and sleek. The GUI should include a header with their logo and contact details in a footer. **Ensure the reservation form is mobile / tablet friendly.**
* The GUI should present a summary of their reservation and output a pop up confirmation once the reservation has submitted and reminds them, they will receive on confirmation email, once confirmed.

Error messages should be user friendly and allow users to recover from their error messages.

**The Programs Specifications**

* The top of the page must contain their Company name and logo heading
* A footer containing their contact details
* The GUI should clearly display each of the vehicles with a photo, daily hire price and their corresponding description
* The user should then be allowed to select a vehicle
* Allow users to select from extra options (listed above)
* Select their number of days – number input (max 14)
* Pick up date – date input
* A reservation summary which outputs the detail of their reservation with an itemised breakdown of the total cost.

**Once the user has selected their vehicle, allow them to add in their details**

* **First name**
* **Last name**
* **Age (if they are younger than 25, they cannot make a reservation)**
* **Cell phone number**
* **Email address**
* A checkbox that the user must tick to ensure they agree to our Terms and Conditions before proceeding **to a button confirming their reservation** and then output the pop up message.
* The program must store all of the booking details to a real time Firebase database

**Step 1: Empathize(2 lesson)**

1. WITHIN your 13DGT/Assessment folder, create a new folder called 3.7 Assessment (Your name)
2. Download the portfolio template and save as your name to this folder.
3. Carry out some initial research into other online Car Rental forms within NZ. Screenshot 3 examples and annotate them in terms of usability, error messages and aesthetics etc.

**Answer the following questions in your design log**

* Define the purpose of your outcome.
* Who will be the end users?
* What are the client’s specifications?
* Identify and describe 3 relevant implications

**Step Two: Define / Trello Board (1/2 lesson)**

1. Use a Trello Board as your project management tool to help you plan and the development of your program.
2. Break your task into the Design Thinking Steps
3. Share your Trello Board with Mrs Bennett and place a link in your portfolio.
4. Decompose your outcome into components and create Trello board tasks for each step

**Step Three: Ideate (2 lessons)**

1. Ideate colour palettes and 3 font options for your GUI
2. Edit images if required and name them appropriately
3. Get end users to vote on their preferred font/colour options
4. Create a high-fidelity wireframe of your GUI, seek feedback from your end users / teacher
5. Makes notes in your Trello board of the suggested changes

**Step Four: Site Set Up (1/2 lesson)**

* Set up your site / images folders
* Create your HTML/CSS/JS files

**Step Five: Prototype / Testing (12 lessons)**

* Begin creating the GUI with a logo and nav bar / footer
* Each time your writing code you should be **trial multiple components or techniques to determine which one will be best for the overall quality of your outcome. For example, you might trial the use of pop-up menus, text boxes or radio-buttons to get the same information from the user in a GUI. You might assess their quality in terms of functionality, usability, flexibility, interface aesthetic, etc. for your outcome.**
* Create a program that handles expected data first then go about adding in code to handle error message and invalid data
* Once your program correctly calculates the output, create your Firebase project to store the data.
* **Ensure you are adding descriptive code comments to each section of code as you code (HTML/CSS/JS)**
* **Clean up your code, validate and save as a new version as you continue to add more complexity to your code. Keeping versions of your html/js files ensures you have something to reference back to.**

**Testing Evidence**

You need to provide evidence of effectively using the information from testing and trialling to **improve the functionality of the outcome**. You may use your project management tools to record and gather evidence of testing, trialling and feedback.

Alternatively, you could take screen captures, recorded in a simple table showing dates, images and a brief statement identifying the stage of your process. You could also capture the process using screencasts. Whatever approach you use, be sure to annotate/discuss the changes you have made and why.

**You must comprehensively test your program and document this process.**

**Take daily sceenshots of your JS/HTML and show what it looks like in browser – the onus is on you to prove authenticity of your code.**

**Step Six: End User Testing (continual)**

1. When you think your program is working as expected, have a range of people test your form – record this as screen recordings (GUI /split screened with Firebase)
2. Have you incorporated user suggestions and feedback to improve the usability, aesthetics, and functionality of the program?
3. Seek a second round of written feedback from your end users
4. If you make changes, screenshot this and explain why.
5. Provide videos of your testing your GUI with the provided test cases of data, provide a screenshot of your saved data in Firebase, proving that it stores it as expected.

**Step Seven: Addressing the implications (2 lessons)**

1. Write a final reflection, explain how the information from the planning, testing and trialling of components to develop a high-quality outcome.
2. **Discuss how this information** lead to the development of a high-quality outcome.
3. This should include evidence of how the **outcome addresses relevant implications**