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A2 GCE

APPLIED INFORMATION AND COMMUNICATION TECHNOLOGY

G054/01/IC Software development

INSTRUCTIONS FOR CANDIDATES

JUNE 2016



INFORMATION FOR CANDIDATES

- This document consists of **8** pages.

NOTICE TO CANDIDATES

The work you submit for these pre-release tasks **must** be your own.

- If you copy from someone else or allow another candidate to copy from you, or if you cheat in any other way, you may be **disqualified** from at least the subject concerned.
 - You **must** always keep your work secure and confidential while you are preparing it. **If it is stored on a computer network, keep your password secure. When printing work, collect all copies from the printer and destroy the copies you don't need.**
 - Any materials (e.g. books, information from the internet you have used to help complete this work, etc.) **must** be clearly acknowledged in the work itself.
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- All work **must** be submitted to your teacher once completed. Ensure you include your name, candidate number and centre number on all pages and that each page is hole punched in the top left-hand corner and secured with a treasury tag.
 - **You must not submit any materials other than your response to the pre-release tasks.**
 - When you hand in your completed tasks, you will be required to sign that you have understood and followed the regulations by completing a Candidate Authentication Statement.
 - Your work will be returned to you at the start of the exam, in the exam room. At the end of the exam, you **must** attach **all** tasks to your question paper using the treasury tag.

ALWAYS REMEMBER:

YOUR WORK MUST BE YOUR OWN

PRE-RELEASE TASKS – INSTRUCTIONS FOR CANDIDATES

Read the attached case study and these instructions carefully, then carry out the tasks detailed below. There are two types of task.

In Task 1 you will produce notes that will help you to answer questions in the examination for this unit. The other tasks will be marked and will contribute up to 30 of the 100 marks available for this unit.

You will need your completed tasks when you take the examination for this unit.

The work produced in response to the pre-release tasks **must** be submitted to your teacher when it is completed. The work **must** be presented as a hard copy.

It is not acceptable for you to copy large parts of material from other sources as the tasks require you to apply your knowledge to the case study. Any books, information leaflets or other materials (e.g. videos, software packages or information from the internet) which you have used to help you complete this work, **must** be clearly acknowledged in the work itself. To present material copied from books or other sources without acknowledgement will be regarded as deliberate deception.

You **must not** submit any material other than your response to the pre-release tasks.

The work **must** be collated so that it is presented in task order.

Each page of the work **must** be marked clearly with your name, candidate number, centre number and task number.

When you have completed the tasks, you **must** sign and date a Candidate Authentication Statement. You **must** then ask your teacher to sign to confirm that the work is your own.

Task 1

Produce the following for Ride and Sail:

- a feasibility study including:
 - the purpose of the system;
 - functional and non-functional requirements;
 - process constraints;
 - a list of deficiencies of the current system;
 - the user requirements of the new system;
 - recommendations for the development of the new system.
- security, hardware and software recommendations.

Task 2

Develop a L1 data flow diagram (L1 DFD) for the current booking system (see **Appendix 1**). The process starts when a passenger contacts Ride and Sail to book a journey and ends when the booking reference number is given to the passenger.

Briefly evaluate the methods you used to develop this L1 DFD.

[15]

Task 3

Produce a decision tree that relates to the decision table given in **Appendix 2**. [10]

Task 4

Design a web-based form to enable passengers to book journeys on-line. [5]

Ride and Sail

Ride and Sail is a small business based in Cumbria. The main function of the business is to provide lake cruises and steam train rides to tourists who visit The Lake District.

The head office of Ride and Sail is in Haverthwaite. This is also the railway station where the steam trains depart and arrive. The owner and administrative staff are based on this site as are the maintenance staff and train drivers. Ride and Sail also has staff based in offices at Lakeside and Ambleside which are both on the shores of Lake Windermere.

Ride and Sail operates a steam railway and steam-powered boats. Tourists can book a return journey, which includes a train ride from Haverthwaite to Lakeside and return, and a cruise on Lake Windermere. Alternatively, a booking can be made for one journey section, i.e. just the lake cruise or a one-way train ride.

The train and the boat usually carry up to 50 passengers. However, if demand is high, e.g. during the school summer holidays, more carriages and a larger boat are available. Before taking bookings for more than 50 passengers, the maintenance staff must be consulted to check that the extra carriages or the larger boat are ready.

All bookings are handled at the Haverthwaite office. Passengers must pay the total cost when they book. This can be done by credit or debit card if the booking is made by phone and also by cash if the booking is made in person. A booking number is given to the passenger and must be quoted when they check in for their journey.

The staff who work in the Lakeside and Ambleside offices provide administrative support, including the checking of all passenger booking numbers. An up-to-date passenger list is emailed to the Lakeside and Ambleside offices when the train has left Haverthwaite. This is to make sure that passengers who are making just one section of the journey, e.g. the ride on the boat, can be checked in.

Ride and Sail has just introduced a local resident loyalty scheme (LRLS). This entitles residents of the local area to a 5% discount on the cost of all bookings made. In addition, when a resident has completed 12 journey sections, they are entitled to their next return journey at a discounted rate of 50%. No further discount is available on this journey. When this journey has been made, a further 12 journey sections must be completed, to receive this discount again.

All bookings of return journeys are given a 5% discount. This discount is not dependent on being a member of the loyalty scheme. These details are given in **Appendix 2**.

To become a member of the LRLS, proof of residence at an address showing an LA or CA postcode must be provided. Residents must register with the loyalty scheme before they can book journeys at the discounted rate. If a passenger is a member of the LRLS they must provide their membership number at the time of booking. There have been occasions when members have tried to book journeys but have been unable to access the appropriate discount as they have lost or misplaced their membership number.

There are two computers at head office. One computer, a laptop, belongs to the owner. This computer is used for keeping staff personnel records and recording the company accounts.

The other computer is a desktop computer and is used by the administration staff. This computer is used to:

- keep records of members of the LRLS;
- keep records of all the bookings made by passengers;
- record payments that are received for each journey;
- keep details of passengers booked on each section of the journey. These details are emailed to staff at the Lakeside and Ambleside offices.

The computers in head office have security software installed but this is not up to date and is rarely implemented.

The offices at Lakeside and Ambleside each have laptops. These are used to receive the passenger lists, by email, from Haverthwaite. Records about any problems with the boats are stored in a document on these laptops, with the document emailed to Haverthwaite at the end of each day. As the offices at Lakeside and Ambleside can become very busy with passengers, problems about the boat are sometimes written on paper. Information has been lost or misplaced as a result. This has meant that problems with the boat have not been rectified which, on occasion, has meant the boat is unable to carry passengers.

The vendor of the operating systems on the laptops is different from that on the computers used at Haverthwaite. In addition, all the applications software is from the same vendor but there is a different version on each computer. This has led to compatibility issues when data has been shared between the computers.

The owner of Ride and Sail has requested that the software, operating systems and applications software used on all computers in Ride and Sail are standardised. A request has been made that the vendor of the software is the one that is used in Haverthwaite, although it is accepted that an updated version may need to be installed.

There are other major problems which also need to be solved by the new system:

- passengers receiving the incorrect discount when booking;
- passenger journey details not being linked to their LRLS membership number;
- customer details not being kept up to date.

The owner of Ride and Sail would like to be able to produce reports detailing:

- the number of bookings for each journey section;
- the amount of revenue generated for each journey section;
- an up-to-date list of the number of bookings for each month of the year.

Staff based at Haverthwaite have asked that they are able to access the LRLS member records when making a booking. This should enable the member number to be input into the booking system so the member details are automatically populated on the booking form. In addition, staff have requested an alert is shown on screen when the train carriages or boat being used are full. This will enable staff to arrange the use of more carriages and/or the larger boat, if possible.

The new system must be implemented on a Monday and Tuesday in the winter months when Ride and Sail only operates at weekends. This is to enable minimum disruption to the business and enable staff to be trained ready for the weekend.

In future it is hoped that Ride and Sail will have a website which would advertise the business and allow bookings to be made on-line.

The owner has allocated a maximum of £15 000 for this project. This must cover the cost of hardware, software development, installation of standardised software and staff training.

Appendix 1

The booking procedure at Ride and Sail when a passenger books a journey is as follows:

- The passenger advises administration staff of the day, time, journey section(s) required, personal details and LRLS membership number.
- A journey requirements form is completed.
- The booking is entered onto the booking system.
- Passenger details are confirmed.
- If the passenger is a member of the loyalty scheme, their record is updated.
- The cost is calculated, with appropriate discounts applied.
- The total cost of the booking is recorded on the journey requirements form and the passenger is advised of the cost.
- The passenger pays the cost.
- The details are confirmed on the booking system and a booking number is generated.
- The booking number and journey details are given to the passenger if booking in person, or posted if the booking is taken over the phone.

Appendix 2

The following decision table is used to calculate the amount of discount each passenger is entitled to.

Conditions	Rule 1	Rule 2	Rule 3	Rule 4	Rule 5	Rule 6
Member of LRLS?	Y	Y	Y	Y	N	N
Sections = 12?	Y	N	N	Y	N	N
Return journey booked?	Y	Y	N	N	Y	N
Actions						
0% discount						X
5% discount			X		X	
10% discount		X				
50% discount	X			X		

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