Surname	Centre Number	Candidate Number
Other Names		0

GCSE – NEW

C500U30-1

S19-C500U30-1

COMPUTER SCIENCE – Component 3
Programming Project

1 SEPTEMBER 2018

20 hours

AVAILABLE ONLY TO CANDIDATES ENTERING THE WJEC-EDUQAS QUALIFICATION ACCREDITED BY OFQUAL

C500U301
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INSTRUCTIONS TO CANDIDATES

You have 20 hours to complete your task.

Read the Information and Task sheets carefully to make sure you understand what is needed.

It is important that you work independently from other candidates and make sure what you produce is your own unaided work.

Candidates should complete a refinement log as described overleaf, explaining any issues encountered and resulting refinements to the original design.

Check your work carefully to make sure that the work you produce is accurate and correct.

INFORMATION FOR CANDIDATES

The quality of your written communication, including appropriate use of punctuation and grammar, will be assessed in your report.

Teachers and candidates will be required to sign a declaration that all work presented is the work of the candidate alone.

Hotel Keys

Parkwood Vale Country House Hotel is being renovated. The management has previously experienced problems with guests forgetting to leave their keys at reception when they leave. This means that the hotel cannot guarantee that the previous guest is unable to enter the room as an intruder.

It would be too expensive to change the physical keys and locks each time this problem occurs so the management has decided to use a system that depends on electronic key cards. Each key will have a secret code saved on it. The receptionist will give each guest a key card with a new key on it when they check in.

The management of the hotel had considered networking the door locks so that the code could be sent to the door lock of the guest's room. However, they have decided that this would be too expensive and have had to find another solution to the problem.

It has been suggested to them that they could use a system whereby each card would have two codes saved on it when the guest checks in:

- The code given to the last occupant of the room and
- A completely new code.

When the new guest first uses the key card to open the door, the door will recognise the old code, which will allow the guest to enter the room. However, the lock will recognise the old code and this will trigger it to alter its code to the new code. This means that the previous guest cannot enter the room even if they still have their key card.

The management know that guests often lose their keys so the system must be capable of preparing a second card for the guest to enter the room without the change affecting any additional key cards issued for that guest and room.

You have been asked to create an application for the **hotel reception** that will allow the user to:

- Enter and store the details of the guests
- Enter the details of the room the guest(s) have been allocated
- Search stored room records for the previously stored old code
- Generate and store a random new code
- Display both old and new code to the receptionist
- When a key is lost:
    - Check the guest's identity
    - Produce a new key that will not affect any other keys issued to the guest

To produce the application, you should:

- analyse the given information
- design a solution to the given problem
- program the solution to the given problem
- test and refine the application, noting the refinements in your refinement log
- evaluate your application.

Produce a report that includes the sections of work included on the Tasks page. Your report should be approximately 2,000 words

Tasks

Refinement log

Complete your refinement log as you work through the project.

A copy of the refinement log can be found in this document.

Complete your refinement log to show that you have:

- carried out the activities in the correct order
- recorded your progress in each session
- described any problems you have had in carrying out your work in each session
- justified any changes to the original design that have to be made because of problems encountered
- identified logical priorities for actions in the next session.

Make sure you have completed your refinement log every session.

Scope of the Problem

Read the information given in the scenario about Parkwood Vale Country House Hotel and their requirements.

Produce a document that:

- clearly summarises the purpose of the project
- identifies the data required to create the application
- identifies the processing to be carried out by the application
- identifies the required outputs from the application
- provides objectives for the project that are manageable and clearly identify the tasks that the application must perform to solve the problem.

Make sure you have completed your refinement log.

Design

Produce a design for the application that includes:

- input and output facilities to be provided by the user interface
- suitable data structures to enable the application to carry out the required tasks
- proposals for validation rules to control data input and limit errors
- designs for input formats including features to aid data entry
- designs for outputs including the intended layout of reports to be generated by the application
- designs for authentication routines
- processing stages as algorithms using standard conventions such as pseudo code or flowcharts.

Make sure you have completed your refinement log.

Effectiveness of Solution

You need to make sure that the finished application:

- is functional and fulfills all the requirements of Parkwood Vale Country House Hotel
- has an interface that is easy to use
- is modular and makes efficient use of resources
- has authentication routines
- is reliable and robust.

Make sure you have completed your refinement log.

Technical Quality

You need to make sure that you have written code which:

- is self-documenting and well structured
- uses a consistent style throughout including indentation and use of white space
- uses meaningful identifiers and appropriate constants
- uses local variables to minimise the use of global variables
- has validation routines and can handle errors such as division by zero
- has informed annotation to demonstrate your understanding of the solution.

Make sure you have completed your refinement log.

Test Strategy and Testing

You need to plan and carry out testing of your application. Remember to use your Refinement Log to identify problems solved in the development of your application.
Produce a document for this section of the work that shows you have:

- considered your application when developing your test strategy
- provided a description of the test strategy in terms of tests and data to be used
- considered how the outcomes of your testing might identify areas for further development
- produced a detailed test plan
- designed appropriate test data
- followed your test plan in a logical and systematic way
- used a full range of test data
- presented your testing outcomes with detailed commentaries
- used accurate grammar, punctuation and spelling.

Make sure you have completed your refinement log.

Further Development

Produce a Further Development document which:

- considers the outcomes of the testing process in terms of how well the application meets the objectives set at the beginning of the project
- describes the good features of the application and identifies areas for further development
- provides detailed suggestions for specific extensions to the application.

Make sure you have completed your refinement log.

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COMPUTER SCIENCE 2019

Programming Project

Candidate name	Candidate number
Centre name	Centre number

Refinement logbook	
Project title	
Start date	
End date	

Session 1	
Date	
Length of session	
Progress made in this session	
Problems encountered with the project	
Changes made to original designs as a result of problems	
Action plan for next session	
Project plan status (on time, ahead of time, behind time)	
Action plan to manage time	

Session 2	
Date	
Length of session	
Progress made in this session	
Problems encountered with the project	
Changes made to original designs as a result of problems	
Action plan for next session	
Project plan status (on time, ahead of time, behind time)	
Action plan to manage time	

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