



**GCSE**

**COMPUTER SCIENCE**

**UNIT 3**

**Software Development Task**

**SAMPLE ASSESSMENT MATERIALS**

**20 Hours**

### **INSTRUCTIONS TO CANDIDATES**

You will 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.

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 on testing.

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

## Rafting Cymru

### Introduction

Rafting Cymru is a white water rafting centre situated in North Wales. The centre has one of the first artificial white water rafting courses to be built in the UK. The manager of Rafting Cymru wants to see the course being well used and she has decided to set up an incentive scheme to encourage repeat bookings.

You have been employed to produce computerised systems for the new incentive scheme.

*All required information about Rafting Cymru and the new booking scheme is provided on the **Information Page**.*

*The **Tasks Page** describes the work you need to carry out to complete the project and lists the content required for each section of the project.*

## Information

Rafting Cymru is a white water rafting centre situated in North Wales. The centre has one of the first artificial white water rafting courses to be built in the UK.

As the water in the course is pumped, the water levels and speed can be controlled so that both experienced rafters and families can use the facility.

Rafts are designed to hold up to six people plus a qualified guide who steers the boat through the rapids. With the water level set at high the course provides thrills and spills for experienced rafters, at the lower setting the course is slower and smoother to suit beginners and family groups.

Family sessions are run at given times when the pumps will be slowed to provide a safer course.

Information on times and prices can be found on page 60.

The manager of Rafting Cymru wants to see the course well used and has designed an incentive scheme to encourage repeat bookings. She has decided to create the following discount offers:

- If a customer has booked a visit to the centre three times, then their fourth booking will be at half price.
- If the first three bookings are for six people each time, the fourth booking will be free.

Examples of discounts can be found on page 60.

Your task is to write an application that will allow the manager to:

- input and store customer details
- input and store customer booking details
- check if a customer can have a discount
- calculate and store the cost of the booking
- display customer and booking details.

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 about 2,000 words.

## Tasks

### Refinement log [5 marks]

Complete your refinement log as you work through the project.

A copy of the refinement log can be found on pages 61 to 64.

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 [8 marks]

Read the information given in the scenario about *Rafting Cymru* 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 measurable and clearly identifies the tasks that the application must perform to solve the problem.

*Make sure you have completed your refinement log.*

### Design [12 marks]

Produce a design for the application that includes:

- input and output facilities 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 [15 marks]

You need to make sure that the finished application:

- is functional and fulfils all the requirements of *Rafting Cymru*
- 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 [20 marks]

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 [8 marks] and Testing [8 marks]

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 [4 marks]

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.*

## Examples of discounts

### Customer Bookings

CustomerID	Date	People
ID001	10/08/2017	3
ID002	11/08/2017	6
ID001	09/09/2017	5
ID002	10/09/2017	6
ID001	16/09/2017	6
ID003	17/09/2017	1
ID002	20/09/2017	6

Customer ID001 has made 3 bookings, the first booking was for 3 people, the second was for 5 people and the third for 6 people. That means the next time Customer ID001 books, the visit will be at half price for each person.

If Customer ID001 books for 4 people the cost will be  $(4 \times £40)/2 = £80$ .

Customer ID002 has made 3 bookings. Each booking was for 6 people and therefore the next visit will be free.

## Times and prices

### White Water Rafting

Cost - £40 per person

Age 12 years and older

### Family White Water Rafting

Cost - £25 per person

Age 6 years and older

**Times** - Wednesday evening and Sunday morning.