National 5
Coursework
Assessment Task

National 5 Computing Science
Assignment
Assessment task

This document provides information for teachers and lecturers about the coursework component of this course in terms of the skills, knowledge and understanding that are assessed. It must be read in conjunction with the course specification.

Valid for session 2021–22 only.

This assessment is given to centres in strictest confidence. You must keep it in a secure place until it is used.

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Computing Science assessment task: evidence checklist

You should complete the checklist for task 1 and either task 2 or task 3.

Task 1	Evidence	
Part A		
1a	Completed task sheet showing the expanded design for step 3	☐
Part B		
1b	Printout of your program code	☐
1c (i)	Printout evidence of the test run showing inputs and message	☐
1c (ii)	Completed task sheet showing the completed test table	☐
1d	Completed task sheet with your program evaluation	☐

Task 2	Evidence	
Part A		
2a	Completed task sheet showing the completed analysis table	☐
Part B		
2b	Completed task sheet showing the completed data dictionary	☐
Part C		
2c (i)	Printout of SQL statement to change the asking price	☐
	Printout of the updated Property table	☐
2c (ii)	Printout of SQL statement to add a new seller's details	☐
	Printout of the updated Seller table	☐
2c (iii)	Printout of SQL statement to display a list of sellers' details	☐
	Printout of the output of the query	☐
2d	Completed task sheet with two reasons for wrong output	☐
2e	Completed task sheet with your evaluation of the database	☐

Task 3	Evidence	
Part A		
3a	Completed task sheet stating one user requirement and two functional requirements for the website	☐
Part B		
3b	Completed task sheet showing the wireframe design for the 'Recommend a Friend' page	☐
3c, 3d, 3e	Printouts of HTML and CSS code: ♦ home.html ♦ recommend.html ♦ styles.css	☐
3f	Completed task sheet with your evaluation of the finished website	☐

Please follow the steps below before handing your evidence to your teacher or lecturer:

- Check you have completed all parts of task 1 and one of **either** task 2 or 3.
- Label any printouts/screenshots with the task number (for example 1a, 2a).
- Clearly display your name and candidate number on each printout.

Task 1: software design and development

AutoFeed has designed an automatic dog food dispenser. The product is designed to help dog owners prevent overfeeding. The food dispenser has five containers. Each container holds a maximum of 200g of food. The containers release this food, one after another, at regular intervals throughout the day.

AutoFeed wants an app to allow users to enter information about the size of their dog and the weight of food they will give them. The app uses this data to show if the weight of food is suitable for the size of dog.

AutoFeed research recommends the following total weight of food (per day), depending on the size of dog.

Size of dog	Recommended total weight of food per day
Small	From 110g to 140g
Medium	From 330g to 440g
Large	From 690g to 900g

After analysing the problem, the following inputs, processes and outputs have been identified.

Inputs

- the weight of food in each container
- the size of dog (small, medium or large)

Processes

- calculate the total weight of food in the five containers
- store a message that states if the total weight of food is within the recommended range
- calculate the average weight of food in the five containers
- round the average weight of food to one decimal place

Outputs

- the weight of food in each container
- the average weight of food in the five containers
- the rounded average weight of food
- the stored message stating if the total weight of food is within the recommended range

Assumptions

- the user can enter a weight using whole numbers or real numbers
- the user does not need to fill all five containers
- the user will not refill any of the containers until all containers are empty

Task 1: software design and development (part A)

Program design (pseudocode)

Main steps

1 Enter valid weight of food in each container and calculate total weight
2 Enter size of dog
3 Store a message that states if the total weight of food is within the recommended range for the size of dog entered
4 Calculate average weight of food
5 Display output messages

Refinements

```
1.1     totalWeight = 0
1.2     start fixed loop 5 times
1.3         enter the foodWeight
1.4         while the foodWeight < 0 or foodWeight > 200
1.5             display “Invalid, a single container can only hold up to 200g”
1.6             re-enter the foodWeight
1.7         end while
1.8         totalWeight = totalWeight + foodWeight
1.9     end fixed loop

2.1     display “Please enter the size of your dog: small, medium or large”
2.2     enter size of dog

4.1     averageWeight = totalWeight / 5
4.2     round averageWeight to 1 decimal place

5.1     start fixed loop 5 times
5.2         display next foodWeight
5.3     end fixed loop
5.4     display total weight message
5.5     display average weight message
5.6     display stored recommendation message
```

1a Step 3 of the program design is incomplete:

3 Store a message that states if the total weight of food is within the recommended range for the size of dog entered

Using the information provided in the program analysis, expand the design to show how this process could be carried out. You can use a flowchart, structure diagram or pseudocode design.

(3 marks)

- Check your answers carefully, as you cannot return to part A after you hand it in.
- When you are ready, hand part A to your teacher or lecturer and collect part B.

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Task 1: software design and development (part B)

Program design (completed pseudocode)

Main steps

1 Enter valid weight of food in each container and calculate total weight
2 Enter size of dog
3 Store a message that states if the total weight of food is within the recommended range for the size of dog entered
4 Calculate average weight of food
5 Display output messages

Refinements

```
1.1   totalWeight = 0
1.2   start fixed loop 5 times
1.3       enter the foodWeight
1.4       while the foodWeight < 0 or foodWeight > 200
1.5           display “Invalid, a single container can only hold up to 200g”
1.6           re-enter the foodWeight
1.7       end while
1.8       totalWeight = totalWeight + foodWeight
1.9   end fixed loop

2.1   display “Please enter the size of your dog: small, medium or large”
2.2   enter size of dog

3.1   if dog size = small and totalWeight is from 110 to 140 then
3.2       store message “This weight of food is suitable for your small dog.”
3.3   else
3.4       if dog size = medium and totalWeight is from 330 to 440 then
3.5           store message “This weight of food is suitable for your medium dog.”
3.6       else
3.7           if dog size = large and totalWeight is from 690 to 900 then
3.8               store message “This weight of food is suitable for your large dog.”
3.9           else
3.10              store message “This weight of food is not recommended for the size of
                  your dog”
3.11          end if
3.12      end if
3.13  end if

4.1   averageWeight = totalWeight / 5
4.2   round averageWeight to 1 decimal place

5.1   start fixed loop 5 times
5.2       display next foodWeight
5.3   end fixed loop
5.4   display total weight message
5.5   display average weight message
5.6   display stored recommendation message
```

1b Using the program analysis and the design, implement the program in a language of your choice.

Make sure the program matches the pseudocode provided on page 14.

(15 marks)

Print evidence of your program code.

1c (i) Run your program using the following test data to check that the message "This weight of food is suitable for your medium dog" is displayed:

Weight 1: 134.23
Weight 2: 74.99
Weight 3: 25.31
Weight 4: 112.33
Weight 5: 53.78
Size of dog: medium

Print evidence of the test run showing all inputs and the message displayed.

(1 mark)

(ii) Additional test data is required to check that the correct output messages are displayed.

Complete the test table below to show the expected results for Test 1 and appropriate inputs for Test 2.

(2 marks)

	Type of test	**Expected results**
Test 1	Weight 1: 30 Weight 2: 50 Weight 3: 45 Weight 4: 150 Weight 5: 70 Size of dog: large	
Test 2	Weight 1: _____ Weight 2: _____ Weight 3: _____ Weight 4: _____ Weight 5: _____ Size of dog: _____	"This weight of food is suitable for your small dog."

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1d With reference to your code, evaluate your program by commenting on the following:

Efficiency of your program code	**(2 marks)**
Robustness of your completed program	**(1 mark)**
Readability of your code	**(1 mark)**

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Task 2: database design and development

ScotAuction sells property in Aberdeen, Dundee, Edinburgh, Glasgow, Inverness, Perth and Stirling.

To register a property for sale, ScotAuction requests the following details from sellers: name, email address, telephone number and home address. ScotAuction gives each seller a unique ID and will contact the seller if an offer is made.

Every property registered for sale must have the following information recorded: house number, street, city, postcode, asking price and estimated property value. ScotAuction generates a unique reference code for all properties. Sellers should also state the number of bedrooms in the property.

A seller can have multiple properties for sale.

A property cannot be listed for sale without the seller's details being recorded first.

Task 2: database design and development (part A)

2a ScotAuction wants to create a database to store the seller and property details.

Complete the property details in the analysis table below.

(2 marks)

Seller details:	**Property details:**
Seller ID Seller name Seller address Email address Telephone number	

- Check your answers carefully, as you cannot return to part A after you hand it in.
- When you are ready, hand part A to your teacher or lecturer and collect part B.

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Task 2: database design and development (part B)

2b Complete the data dictionary below, by identifying the primary and foreign keys in the relational database.

(2 marks)

Entity: Seller					
Attribute name	**Key**	**Type**	**Size**	**Required**	**Validation**
sellerName		text	50	Y	
sellerAddress		text	255	Y	
sellerID		text	4	Y	
email		text	100	N	
telephoneNumber		text	11	Y	Length = 11

Entity: Property					
Attribute name	**Key**	**Type**	**Size**	**Required**	**Validation**
houseNumber		number		Y	
street		text	75	Y	
city		text	9	Y	Restricted choice: Aberdeen, Dundee, Edinburgh, Glasgow, Inverness, Perth, Stirling
postcode		text	8	Y	
propertyRef		text	15	Y	
sellerID		text	4	Y	
numberOfBedrooms		number		Y	
estimatedValue		number		Y	Range: >= 0 AND <= 300000000
askingPrice		number		Y	Range: >= 0 AND <= 300000000

- Check your answers carefully, as you cannot return to part B after you hand it in.
- When you are ready, hand part B to your teacher or lecturer and collect part C.

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Task 2: database design and development (part C)

2c Your teacher or lecturer will give you a database file containing two linked tables.

(i) The asking price for propertyRef DUN-101 has not been recorded correctly. This should be changed from £105500 to £112000.

Implement an SQL statement that will make the required change to the asking price.

(2 marks)

Print evidence of the SQL statement and the Property table, clearly showing that the change has been implemented.

(ii) Implement an SQL statement that will add the following details of a new seller to the database.

sellerID:	1502
sellerName:	Eve Grace
sellerAddress:	128 Cameron Drive Edinburgh EH4 5DS
email:	EveGrace@yehoo.net
telephoneNumber:	0131 279100

(2 marks)

Print evidence of the SQL statement and the Seller table, clearly showing that the change has been implemented.

(iii) ScotAuction is running a workshop to give sellers advice on how to achieve a higher sale price. Due to the limited spaces available, ScotAuction is only inviting selected sellers to attend.

Implement an SQL statement that will display the seller's email address and telephone number along with the property's postcode for properties that have three bedrooms and an asking price of less than £150000.

(4 marks)

Print evidence of the SQL statement and the output.

2d ScotAuction would like a list of seller IDs and asking prices for properties in Glasgow. The list should be sorted showing the lowest price first.

The following incorrect SQL statement is written:

```
SELECT Seller.sellerID, price
FROM Seller, Property
WHERE town = "Glasgow" AND Seller.sellerID = Property.sellerID
ORDER BY askingPrice ASC;
```

Test this SQL statement.

State two reasons why this SQL statement will not run when implemented.

(2 marks)

Reason 1
Reason 2

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2e The initial analysis identified the following functional requirements for the database. It should:

- allow ScotAuction to store a seller's email address and telephone number
- allow sellers to state an estimated value of their property
- record key details about each property, including the address and the number of bedrooms
- limit the value and location of the properties that can be entered

Use the above analysis to evaluate the database in terms of fitness for purpose.

(1 mark)

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Task 3: web design and development (part A)

Customised Cakes makes and sells custom cakes for family events and celebrations. This includes birthday cakes, wedding cakes as well as cakes for other events.

It wants a website containing the following elements:

- the title 'Customised Cakes'
- a short statement about the shop's promise to customers
- separate pages for each category of cake: birthday cakes, wedding cakes and other special occasions
- a 'Recommend a Friend' page that gives details on how to register for rewards for customers and their friends
- at least one photograph on each page showing cake designs
- a video on the home page showing a cake being iced
- an external link on the 'Recommend a Friend' page to 'The Great British Bake Off' website

3a State **one** end-user and **two** functional requirements for the website.

End-user requirement	**(1 mark)**
Functional requirement 1	**(1 mark)**
Functional requirement 2	**(1 mark)**

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- Check your answers carefully, as you cannot return to part A after you hand it in.
- When you are ready, hand part A to your teacher or lecturer and collect part B.

Task 3: web design and development (part B)

3b Your teacher or lecturer will give you a copy of the unfinished website.

Open the website and look carefully:

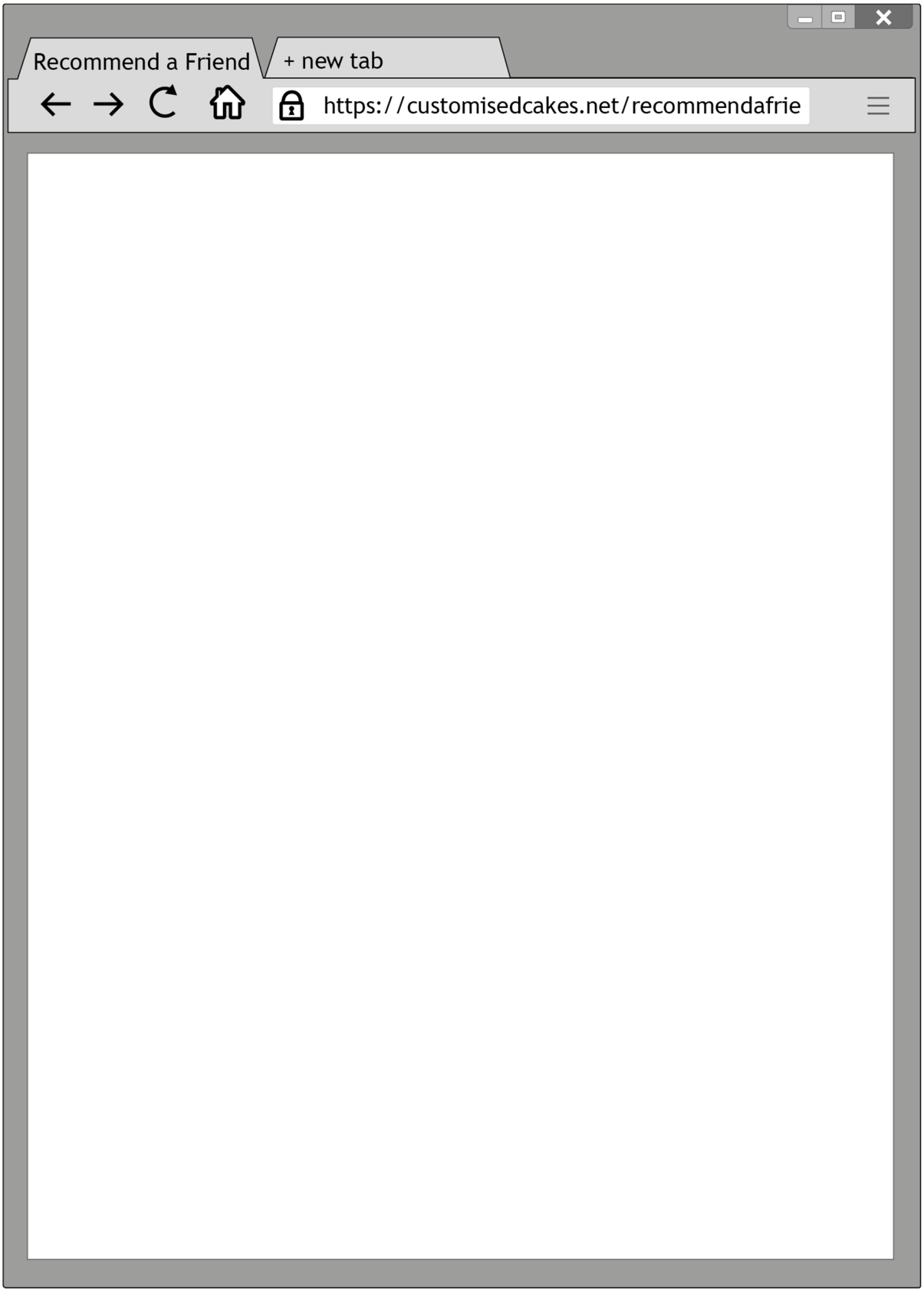
- at the layout of each page
- at the content of each page
- at the navigation within the website
- for any text and graphics that appear on every page

The 'Recommend a Friend' page currently has no content. When complete, it should be consistent with the other pages and include the following additional content:

- a message stating that for every friend you recommend who places an order, you will receive a free slice of cake
- a message stating that both you and your friend will receive 20% off your next order
- a message stating that most orders are delivered within three days
- a message telling the user that they can take part in the 'Recommend a Friend' scheme by emailing their friend's name and email address to referafriend@customisedcakes.net
- an image (300 x 240 pixels) of a slice of cake
- an external link to 'The Great British Bake Off' website https://www.thegreatbritishbakeoff.co.uk
- a hyperlink back to the home page

Complete the wireframe on the following page, showing the website layout and the content for the 'Recommend a Friend' page.

(2 marks)



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3c Open the recommend.html and styles.css files so you can edit them.

Implement your design of the 'Recommend a Friend' web page using HTML, including all of the content and any hyperlinks required.

An image of a slice of cake ('cakeSlice.jpg') is provided in the files.

(4 marks)

3d Customsied Cakes wants to add the video file 'cakeVideo.mp4' to the homepage.

Edit the home.html file to implement this change.

(1 mark)

3e The table below shows feedback received during testing and the required changes:

Feedback received	Required changes
"The website would look better if the coloured sections on each page were the same colour."	Change the coloured sections to DeepSkyBlue (#00BFFF).
"The company motto 'Beautiful, hand-crafted custom cakes for any occasion' needs to look more professional."	Change the font size to 22 and the font to Arial.
"The link to 'The Great British Bake Off' website does not stand out enough."	Change the style of the text in the link https://www.thegreatbritishbakeoff.co.uk to colour OrangeRed (#FF4000) with a font size of 16.

Edit the recommend.html and styles.css files to implement these changes.

(3 marks)

Print evidence of your code from these edited files:

- home.html
- recommend.html
- styles.css

3f Initial analysis identified the following functional requirements for the website. It should display:

- the name of the shop and the shop's customer promise
- at least one image of each type of cake
- details of the 'Recommend a Friend' promotion
- a video of a cake being iced
- a link for each page of the site and a link to 'The Great British Bake Off' website

Use the above analysis to evaluate your finished website in terms of fitness for purpose.

(2 marks)

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