Level 2 Create designs and test software components (7266/7267-201)

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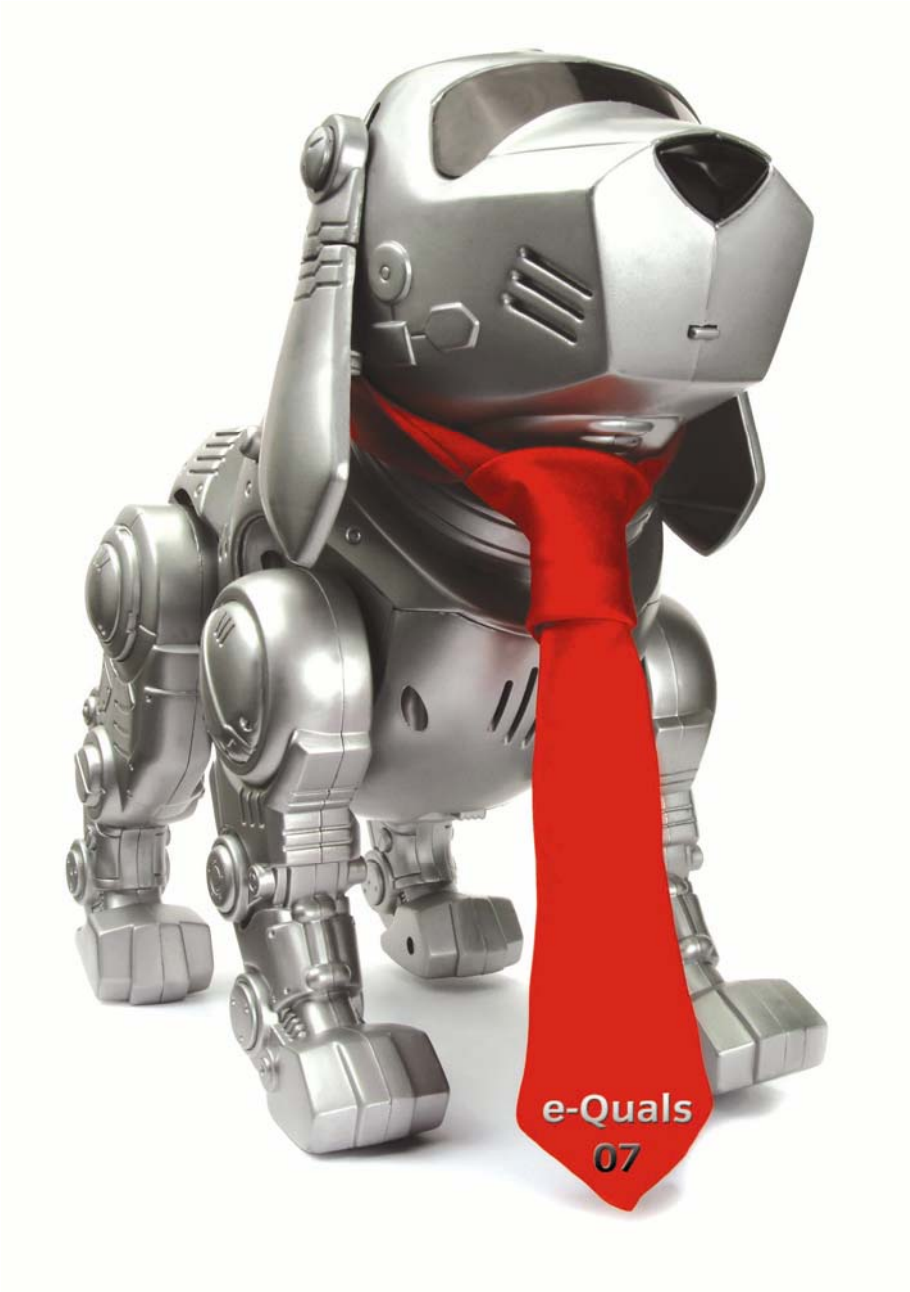
Assignment guide for Candidates
Assignment C



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City & Guilds
1 Giltspur Street
London EC1A 9DD
T +44 (0)20 7294 2800
F +44 (0)20 7294 2400

www.cityandguilds.com
learnersupport@cityandguilds.com

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Introduction – Information for Candidates

About this document

This assignment comprises part of the assessment for Level 2 Create designs and test software components (7266/7267-201).

Health and safety

You are asked to consider the importance of safe working practices at all times.

You are responsible for maintaining the safety of others as well as your own. Anyone behaving in an unsafe fashion will be stopped and a suitable warning given. You will **not** be allowed to continue with an assignment if you compromise any of the Health and Safety requirements. This may seem rather strict but, apart from the potentially unpleasant consequences, you must acquire the habits required for the workplace.

Time allowance

The recommended time allowance for this assignment is **4 hours.**

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Candidate instructions

Candidates are advised to read all instructions carefully before starting work and to check with your assessor, if necessary, to ensure that you have fully understood what is required.

Time allowance: 4 hours

Assignment set up: A scenario is provided for candidates in the form of a company specification for a service they require.

This assignment is made up of **four** tasks

- **Task A** - provides an outline design specification for a software component to validate input.
- **Task B** - provides criteria that should be followed by candidates when producing their design work.
- **Task C** - provides a specification for the software which requires functional testing.
- **Task D** - provides criteria that should be followed by candidates when producing the testing documentation.

Scenario

A software development company, Sporting Systems, develop software for use by clients. Software is being developed to create and maintain booking details for a golf club. You have been asked to design the software component that validates input. You are then required to test the whole program after development.

Task A

Candidates should use the following specification to fulfil the company's requirements

In this task you are required to design the routines for validation of booking records. The validation routine will be called by another routine. If a field is invalid the appropriate error message must be displayed. When every field in the screen input form has been accepted control must be passed back to the calling routine. Shown below is the screen input layout for a member record.

The File menu should be used to open the file each time printing is required.

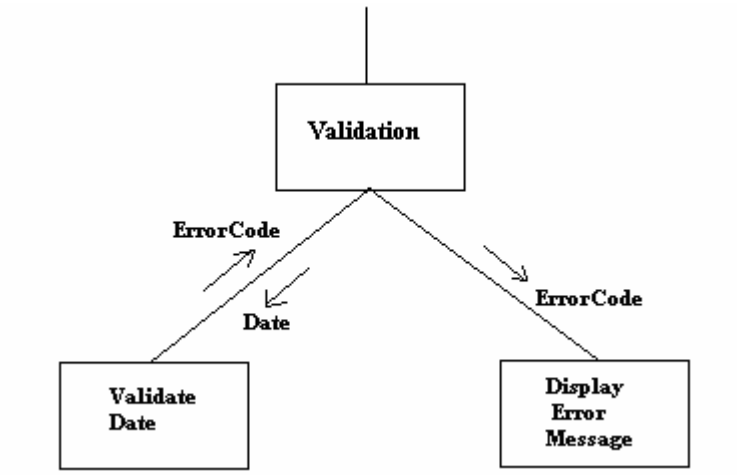
The Records menu should be used to display the records on screen or to send the records to the printer.
The End menu should be used to exit the program.

The fields and the validation required is shown in the following table.

Field	Validation
Membership Number	Not spaces Modulus 11 Must be 6 digits Numeric
First Name	None
Last Name	None
Guest 1	None
Guest 2	None
Guest 3	None
Number of Guests	None
Number of Holes	9 or 18
Date of Game	dd/mm/yyyy Full date check
Booking Date	dd/mm/yyyy Full date check
Personal Transport (Buggy)	Y or N
Number of Golf Bag Trolleys	0 1 2 3 or 4

For an explanation of a modulus 11 validation check for the membership number see Appendix A

The structure chart for the validation routines is shown below.



1 Use a program design language to produce the design for the validation routines. Perform all validation as required for the design. Any assumptions you make about the design must be documented.

2 Some error codes have already been defined for the software and are shown below with their associated message.

Error Code	Error Message
1	1: Membership Number is not numeric
2	2: Membership Number is not 6 digits
3	3: Membership Number is not a valid modulus 11 number
4	4: Number of Holes must be 9 or 18
5	5: Golf Bag Trolleys must be 0 1 2 3 or 4
6	6: Check Date of Game and enter dd/mm/yyyy
7	7: Check Booking Date and enter dd/mm/yyyy
8	8: File not open
9	9: Personal Transport (Buggy) required must be Y or N

The error codes 10-14 are unassigned and if required can be used for extra error messages for your routines. Document any new error messages used.

3 Appendix B shows a decision table used for establishing hire fees, which are calculated in another module in the system. You are required to complete the table as instructed.

Task B

Check that you have followed the criteria below when producing the design for the validation routines:

1 The design conforms to the design specification.
2 The design uses the most appropriate data type(s).
3 The design is consistent and complete.
4 The program design language clearly shows variable names and data types, constants, argument names and data types, return value data types and any data structures used.
5 The program design language clearly shows the beginning and end of each iteration, selection and routine.

Task C

The software has now been developed and includes the routines for file creation, validation and printing.

In this task you are required to carry out functional testing of the Golf.exe software.

Each time the Save Record button is pressed the record is validated and if the record is correct the Save As dialog appears so that the filename can be selected/entered and then the file is opened as append and the displayed record is appended to the end of the file. The records are written to the file in text format (.txt) with each individual field as string data terminated with a carriage return. The file can be opened, read and printed using a text editor (eg Notepad).

The file layout for the append file is shown below.

999999
XXXXXXXXXXXXXX
XXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXX
9
99
99/99/9999
99/99/9999
X
9

The print layout for the printed records is shown below:

```
                        Booking Records                                 Page        Z9
                        99/99/9999

Number   Member         Guests                      No. of   Date of     Transport   No. of
         Name                                       Holes    Game        (Buggy)     Trolleys


999999   XXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXX 99       99/99/9999  X           9
         XXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXX
                         XXXXXXXXXXXXXXXXXXXXXXXXX

999999   XXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXX 99       99/99/9999  X           9
         XXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXX
                         XXXXXXXXXXXXXXXXXXXXXXXXX
```

(Where 9 represents a digit, X represents an alphanumeric character and Z represents zero suppression.)

Four booking records must be printed per page and then a new page thrown with a heading.

1 Prepare a test plan to carry out functional testing of the software.
2 Prepare the test data to be used with the test plan.
3 Use the test plan and test data to carry out a series of tests and record the test results in a test log.
4 Use the test log to produce a report which specifies the presence or absence of errors and makes proposals for rectifying errors and reports on the success of the test against the original software specification.

Task D

Check that you have followed the criteria below when producing the testing documentation:

1 The test plan contains a test number, date, purpose and type of test and expected outputs for stated inputs.
2 The test data tests the software execution under normal and exceptional circumstances.
3 Evidence of printed output, screen prints and file output must be cross referenced to the correct test number.

Notes

- Candidates should produce the following for their assessor:
    - program design language algorithms for the validation routines
    - appendix B - decision table
    - test plan, test data and test log for the testing
    - a report on test results
    - cross referenced evidence of testing ie screen prints, printed output and file output as necessary to show test results.
- At the conclusion of this assignment, hand all paperwork and removable storage media to the test supervisor.
- Ensure that your name is on the removable storage media and all documentation.
- If the assignment is taken over more than one period, all removable storage media and paperwork must be returned to the test supervisor at the end of each sitting.

Modulus 11 check

A modulus 11 check is carried out as follows:

Multiply each digit in the membership number, staring at the right, by the number 1, then 2, then 3 etc.

Multiply by	**6**	**5**	**4**	**3**	**2**	**1**
Membership Number	1	3	5	2	7	5
Result	6	15	20	6	14	5

The result of each multiplication is added together.

6 + 15 + 20 + 6 + 14 + 5 = 66

The result of the addition is then divided by the modulus (11).

66 divided by 11 = 6 remainder 0

If the remainder from the division is 0 the Membership Number is a valid modulus 11 number otherwise the Membership Number is not a valid modulus 11 number.

The remainder is 0 so the Membership Number 135275 is a valid modulus 11 number.

Appendix B

Decision Table

Golf Bag Trolleys are hired out for a fee of £5 per trolley, irrespective of the number of holes played. Personal Transport (Buggy) can be hired for a fee of £10 for a game of 9 holes or £20 for a game of 18 holes, irrespective of the number of passengers.

Task 1. Logically, no Trolleys would be required if all players travelled on a Buggy (it would also carry their golf bags). Complete Rules 5 and 9 to represent this situation.

Task 2. A special offer is in force, whereby 4 Trolleys can be hired for the price of 3 (ie a discount of £5 if 4 are hired). Create Rule 4 to represent this offer.

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Conditions												
Trolleys												
0					y				y			
1	y					y				y		
2		y					y				y	
3			y					y				y
4												
Trolley Discount												
Buggy												
9 Holes						y	y	y				
18 Holes										y	y	y
Actions												
Trolley Hire (£5)	£5	£10	£15			£5	£10	£15		£5	£10	£15
Buggy Hire (£10 or £20)						£10	£10	£10		£20	£20	£20
Discount (-£5)												
Total	£5	£10	£15			£15	£20	£25		£25	£30	£35

Enter your name below this sheet for your submission

Name… … … … … … … … … … … … … … … … …..

Published by City & Guilds
1 Giltspur Street
London
EC1A 9DD
T +44 (0)20 7294 2468
F +44 (0)20 7294 2400
www.cityandguilds.com

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