Level 3 Develop software using Java (7266/7267-305)

e-Quals
Assignment guide for Candidates
Assignment B

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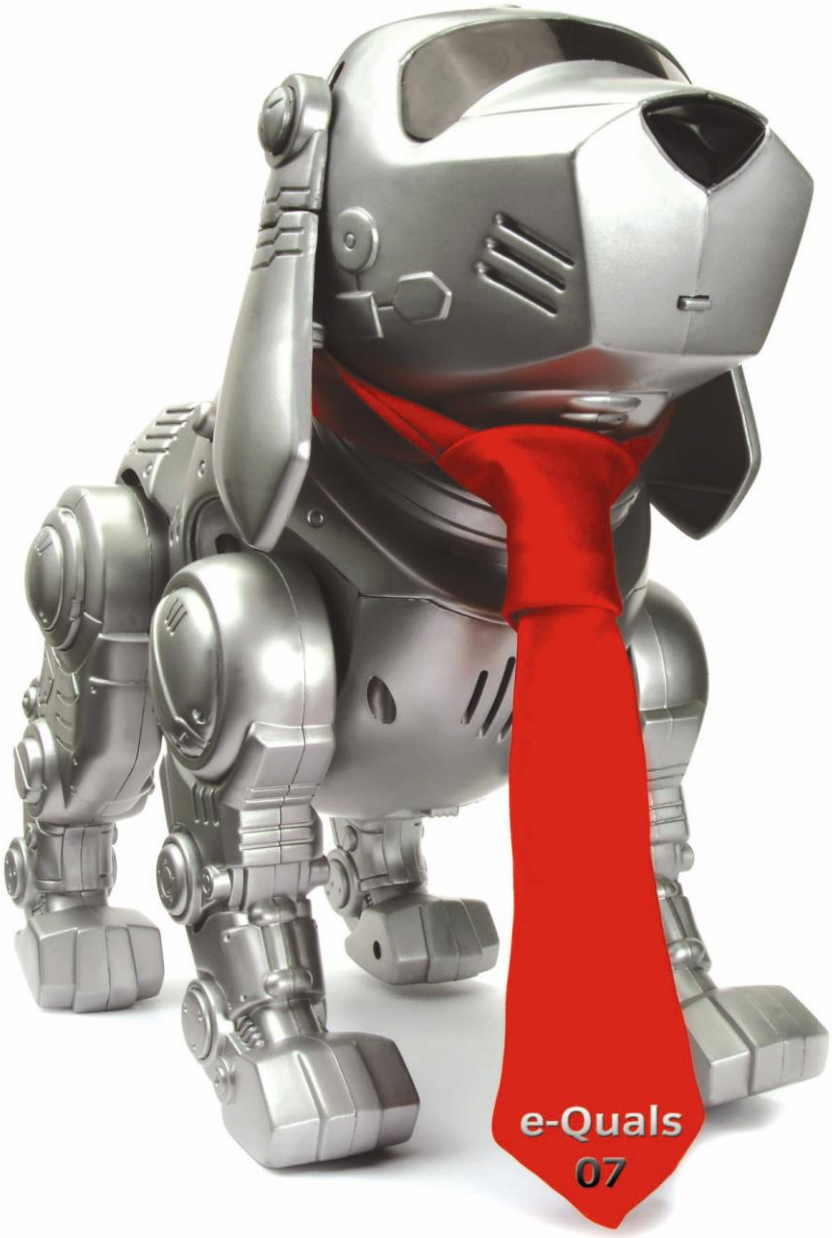

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Introduction – Information for Candidates

About this document

This assignment comprises part of the assessment for Level 3 Develop software using Java (7266/7267-305).

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 **6 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: 6 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 **three** tasks

- **Task A** - provides a detailed design specification that should be followed by candidates when developing their program.
- **Task B** - requires the candidate to test the program and provide documentation.
- **Task C** - provides criteria that should be followed by candidates when producing their work.

Scenario

A finance company, Web Banking, is developing software for validating and handling times to use as a library routine available within the company. As an employee of Web Banking, you have been asked to design, create and test the software which will perform the following functions:

- Determine whether a time in 24 hour format is valid.
- Given a time in 24 hour format change it to standard format.
- Given a time in standard format change it to 24 hour format.
- Subtract one time from another.
- Add one time to another.

Task A

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

In this task you are required to design, create and test a new class called newTime.

1 Design a solution for a new class called newTime. Document the following methods in a program description language (pseudocode, flowchart or structured English):

a public boolean valid24Time (int hh, int mm)
The hours (hh) can only be in the range 0-23 and the minutes (mm) can only be in the range 0-59.
This method must return true if the time is valid and false if the time is invalid.

b public String convert24ToStd (int hh, int mm)

The time is passed to the method as hours (hh) and minutes (mm) with the time in 24 hour format. The 24 hour format must be changed into standard format in the form hh:mm AM for a morning time and hh:mm PM for an afternoon time.

This method must return a string containing the time in standard format.

c public int convertStdTo24 (String hhmm)

The time is passed to the method as a string in standard format in the form hh:mm AM for a morning time and hh:mm PM for an afternoon time. The standard format must be changed into 24 hour format.

This method must return an integer containing the time in 24 hour format.

d public int addTime (int hh1, int mm1, int hh2, int mm2)

Two times are passed to the method in 24 hour format as hours and minutes (hh1 and mm1, hh2 and mm2). The two times must be added together.

This method returns the calculated time as an integer in 24 hour format.

e public int subtractTime (int hh1, int mm1, int hh2, int mm2)

Two times are passed to the method in 24 hour format as hours and minutes (hh1 and mm1, hh2 and mm2). The second time must be subtracted from the first.

This method must return the calculated time as an integer in 24 hour format.

2 Error handling routines must be included to deal with exceptions.

3 Write the code for the newTime class.

4 Document the layout of any input and output screens used and create a testnewTime class which tests the methods in the newTime class.

Task B

In this task you are required to test the program you have created and provide documentation.

1 Create test data to test the newTime class and determine the expected results. Test the software, compare the actual results to the expected results and resolve any logical and run-time errors found.

2 Print a listing of the code for both classes.

Task C

Candidates should follow the criteria below when producing their work:

1 The program conforms to the design specification.

2 The code is structured.

3 Meaningful names are used for classes, methods and attributes using consistent naming conventions.

Note

- Candidates should produce the following for their assessor:
    - Program description language algorithms for each method in the newTime class.
    - Screen layouts.
    - Test data and expected results.
    - A printed program listing of both classes (newTime and testnewTIme).
- At the conclusion of this assignment, hand all paperwork and removable media to the test supervisor.
- Ensure that your name is on the removable media and all documentation.
- If the assignment is taken over more than one period, all removable media and paperwork must be returned to the test supervisor at the end of each sitting.

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