



SOFTWARE DESIGN

& PROGRAM DEVELOPMENT



SAMPLE LAB EXAM 3

There are 4 questions in this exam - answer all questions.

TOTAL MARKS: 100

Question 1: 10 marks

Question 2: 25 marks

Question 3: 25 marks

Question 4: 40 marks

PLEASE ENSURE THAT YOUR CODE COMPILES AND RUNS FOR EACH QUESTION. CODE THAT DOES NOT COMPILE WILL BE DOCKED MARKS. IF YOU HAVE CODE OR BLOCKS OF CODE THAT DOES NOT COMPILE, ENSURE THAT IT IS COMMENTED OUT PRIOR TO SUBMISSION.

ENSURE YOU UPLOAD A ZIP OF THE ENTIRE FOLDER CONTAINING ALL YOUR JAVA FILES, CLASS FILES AND ANY OTHER ASSOCIATED FILES CREATED FOR THIS ASSESSMENT.

Getting Started

- For each question create a java file called **FirstnameSurnameQuestionX.java** using your own first name and surname accordingly, where X is the number of the question. Rename the class name to match your Java program file name.

Eg:

JoeBidenQuestion1.java

JoeBidenQuestion2.java

JoeBidenQuestion3.java

JoeBidenQuestion4.java

- Add your name, student ID and today's date as comments to the top of each program.

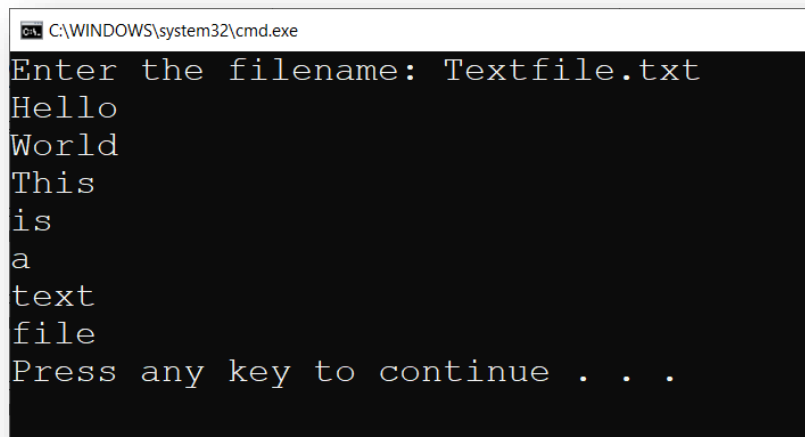
Requirements

- Ensure your code has meaningful variable names, class names and method names
- Ensure your code has appropriate use of space and indentation
- Ensure any non-working code is commented out prior to program submission
- Use comments throughout your program to describe the functions of blocks of code

Question 1 (10 marks)

Write a program that prompts the user to enter a filename, and then outputs the contents of the file to the console. Use the file provided called "Textfile.txt" to test your program. Your program should use a while loop using the hasNext() method.

Sample output:

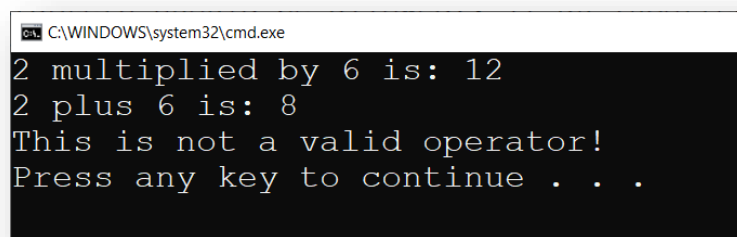
A screenshot of a Windows command prompt window. The title bar shows the path "C:\WINDOWS\system32\cmd.exe". The window has a black background with white text. The text displayed is: "Enter the filename: Textfile.txt", "Hello", "World", "This", "is", "a", "text", "file", and "Press any key to continue . . .".

```
C:\WINDOWS\system32\cmd.exe
Enter the filename: Textfile.txt
Hello
World
This
is
a
text
file
Press any key to continue . . .
```

Question 2 (25 Marks)

Write a program with a void static method that will accept 3 parameters – two integers and one character. The two integers denote numbers that can be provided to perform calculations on, and the character specifies the operator, where 'a' is for addition and 'm' is for multiplication (uppercase or lowercase characters should be allowed). If an incorrect operator is specified, then a message should be output to the console, stating "This is not a valid operator!".

The program should produce output similar to as shown here:



```
C:\WINDOWS\system32\cmd.exe
2 multiplied by 6 is: 12
2 plus 6 is: 8
This is not a valid operator!
Press any key to continue . . .
```

Your program should be structured similar to as shown here, in a single java file:

```
public class SampleEx3_Q2
{
    public static void main(String[] args)
    {
        calculate(2, 6, 'm');
        calculate(2, 6, 'a');
        calculate(2, 6, 'x');
    }

    //Calculate method to go below:

}
```

Question 3 (25 Marks)

Design a class that holds the name of a Computer model (String), size of ram in the computer (int) and the size of the disk drive (double). The class should be called Computer and have 3 fields – name, ram and disk. Create getters and setters for each of these fields. Create an additional method called getRating, that will calculate a rating for the computer. Computers are rated either 'A' or 'B'. A computer that has ram of 8 or more and a disk of 1 or more gets an 'A' rating, otherwise it gets a 'B' rating.

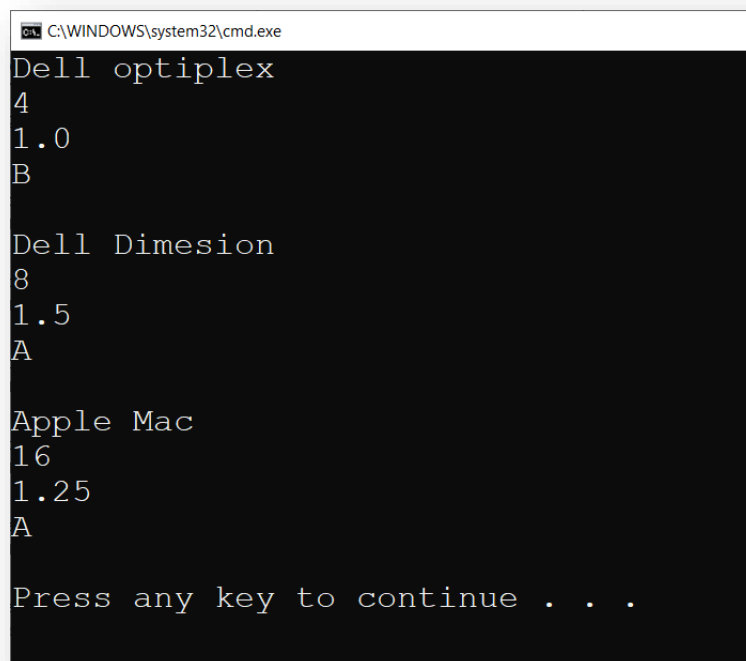
Using this class, create 3 objects in the main method using the following information:

Name: Dell optiplex
Ram: 4
Disk: 1.0

Name: Dell Dimesion
Ram: 8
Disk: 1.5

Name: Apple Mac
Ram: 16
Disk: 1.25

Output all values for each object using getters – your output should be similar to as shown below, outputting the name, ram, disk and rating for each object:



```
C:\WINDOWS\system32\cmd.exe
Dell optiplex
4
1.0
B

Dell Dimesion
8
1.5
A

Apple Mac
16
1.25
A

Press any key to continue . . .
```

Question 4 (40 Marks)

Create a class called Customer with three fields for first name (String), surname (String) and age (integer). Create a default constructor that will set the firstname and surname fields to the value "none", and set the age field to '0'. Create an additional three constructor methods for the class. The first constructor should accept a single string as an argument to be used for the firstname field only. The second constructor should accept two string arguments to be used for both the first name and the surname. The third constructor should accept all fields. There should be no other constructors. Create getters and setters for each field.

Create objects using all the constructors:

Customer 1

First name: Jane

Use the single argument constructor

Customer 2

First name: Charlie

Surname: Smith

Use the double argument constructor

Customer 3

First name: Jane

Use the default constructor

Customer 4

Input all the values below using the scanner

First name: Bob

Surname: Smith

Age: 25

Use the three-argument constructor

Output the objects to the console using getters – your output should be similar to as shown below:

```
C:\WINDOWS\system32\cmd.exe
Enter customer firstname: Bob
Enter customer surname: Smith
Enter customer age: 25
Jane
null
0

Charlie
Smith
0

None
None
0

Bob
Smith
25
Press any key to continue . . .
```