

COM1003 Java Programming - Autumn Semester 2014-5

Assessed Assignment 2

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Learning outcomes

This assignment will assess your ability to:

- Write a program from a specification;
- Write clear, good quality program code;
- Use loops in Java;
- Use the Sheffield package for graphical output;
- Use arrays in Java.

It is worth 20% of your mark for the first semester of the module and must be submitted by 28 November 2014. You will find information about the exact deadline, the marking scheme and how you must submit your work at the end of this document.

You do not need to do everything described below to hand in your work and get marks for it. The marks will be awarded depending on how much you have achieved (see below for details) but if you hand in a program it must compile and run to get any marks. So a well written program that does something is always better than a program which would do more if it had worked.

The Program

Your program is to display two versions of a picture using the **EasyGraphics** class of the **sheffield** package. The picture to be displayed will be provided in the form of a file of digits called **picture.txt**.

Your program must be called **Picture.java** and it must read in a data file called **picture.txt** stored in the same directory as the program, whatever directory that is. You have been provided with some sample data to test it with although a different file conforming to the same specification will be used in assessing your program.

The data file contains 40,000 digits. These digits can be used to form a picture. For the simplest version of the picture, on a 200 X 200 graphics display, plot a dot in one of two colours (you can choose which but they must be sufficiently different to be obvious) for each digit. If the digit is in the range 0 to 3 the output should be one colour and for digits in the range 4 to 9 the dot should be in the other colour. Note the digits are arranged in the file in rows (although there is no marker between rows) and starting from the top of the picture. So the first digit represents the top left corner of the picture and the last is the bottom right. There is nothing else in the file except these 40,000 digits and you must use the Sheffield package's EasyGraphics class to get the marks.

If you get this far with a well written program you can get 50%

In fact the digits contain more information suggested above. The picture is in colour. The digits 0-3 represent the colour blue, the digits 8-9 the colour brown and the digits 4-7 green but the green is split into two different shades; 4 and 5 are one shade and 6 and 7 another. Replace the previous display but one in colour and, to make it the detail more obvious, display it in a 600X600 screen where each digit turns into a 3 by 3 pixel block. Again you must use the Sheffield package's EasyGraphics class to get the marks.

If you get this far with a well written program you can get 60%

Between reading the data in and displaying it store it in a suitable array.

If you get this far with a well written program you can get 70%

Convert the picture to a 200 X 200 sketch which is mostly white but the colour boundaries of the original picture are in black and display it too. You should ignore the outside edges when doing this. The black and white sketch should appear on top of the earlier display in a different window. You should use the stored data to produce this picture. If you read the file in twice instead you won't get any marks for this section.

If you get this far with a well written program you can get 100%

Submission and deadline

You should hand in your solution using the standard departmental hand in procedures described in the Undergraduate handbook at <http://www.dcs.shef.ac.uk/intranet/teaching/public/assessment/handin.html> so you should hand in one paper copy and one electronic copy.

The electronic copies should be uploaded to MOLE. (Click on the Assignment 2 icon where you downloaded this piece of paper from). You should upload **Picture.java** only. The deadline for the upload is 3pm on Friday 28 November 2014.

The paper copy should be labelled (or start with a comment) containing your name or user name (because that is how MOLE identifies students – it does not use registration numbers so I cannot put the two copies together by registration number) and with a standard bar coded cover sheet. It must be readable or you will lose marks so if your lines are too long to look readable when printed in portrait layout use landscape. The deadline for this is also **3pm on Friday 28 November 2014.**

You have to submit your work in both forms to get a mark and the paper and electronic versions must be identical. Late work will be penalised using the standard University scale (a penalty of 5% per working day late; work will be awarded a mark of zero if more than 5 working days late). Your work will be considered to have been handed in on the day the second of the two forms (paper and electronic) is handed in.

Your work will be checked for plagiarism. Don't even think about handing in work you didn't do yourself.

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Marking Scheme

The mark for this assignment is worth 20% of the first semester mark and so 10% of the overall mark for COM1003.

For this assignment you will still receive marks for style but this time the marks for a working program which meets the specification will be added to the style marks not multiplied by them.

The marking scheme is as follows.

The Working Program

Use of loops in Java	20%
Use of the Sheffield package for graphical output	20%
Use of arrays in Java	20%
Follows specification*	10%

Program Style

Correct use of variables and constants	10%
Readability (so it must be easy to understand)	20%

* The mark for following the specification means the specification as far as the program is completed so incomplete programs will not be penalized under this heading.