January 11th, 2022

Exercises for Programming Practice 1

The submitted program will be evaluated as described in “Lesson Plan (2021)”.

Note:
- ✓ Do not create “module-info.java”, when you create a Java Project.
- ✓ Do not set Package name in the window “New Java Class”.
- ✓ The following information must be included as a comment at the first part of the program.
  - ➢ Contents of the program
    - ✧ Do not use the title of exercise for “contents of the program” Think about “contents of the program” yourself.
  - ➢ Submission date
  - ➢ Program creator
- ✓ Wrong file name (including case sensitivity) is not accepted.

The deadline for submitting the programs is 17:50 on January 11th, 2022.

Download “imageL3.jpg” from “Week 14” page Resource of “Programming Practice 1”, manaba+R.

Exercise 31 (file name “Exercise31.java”)

Create Java program “Exercise31.java” which displays face areas in image “imageL3.jpg” using three classifiers. The number of face areas identified by each classifier is displayed on the standard output.

The following conditions should be satisfied.

(1) The window size is 560 pixels wide by 400 pixels vertical.
(2) Since the size of the image “imageL3.jpg” is 1080x720, draw it in half the length. The upper left coordinates of the image to be drawn are (10, 30).
(3) The classifier is specified according to the check digit (the last digit number of your Ritsumeikan ID) as shown in Table 1. Use yellow color bordered rectangle to display the face area. Notice that the size of the image is halved in length.
(4) Display the name of the classifier used and the number of face areas acquired in the Console.

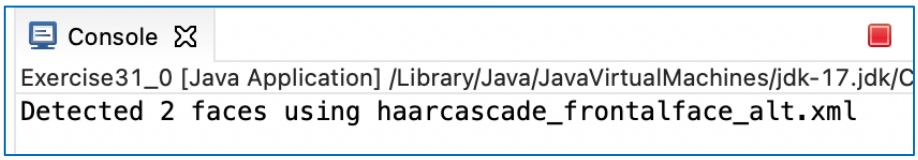
Refer “Cascade1.java” of “FourteenthDay.pdf”in “Programming Language”.

An example of the display result of the face area is shown in Figure 1. An example of the Console output is shown in Figure 2.

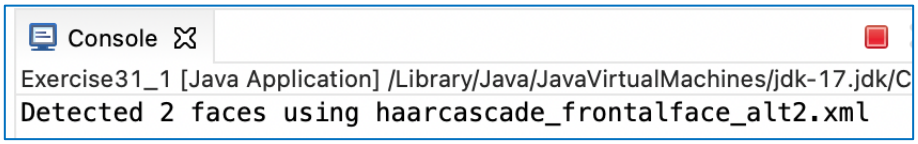
Table 1. Selection of the first classifier.

The remainder after dividing the check digit by 3	Classifier
0	haarcascade_frontalface_alt.xml
1	haarcascade_frontalface_alt2.xml
2	haarcascade_frontalface_default.xml

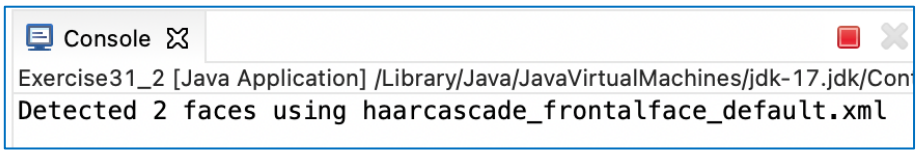
Figure 1. An example of the display result of the face area.



(a)



(b)



(c)

Figure 2. Examples of the Console output.

(a) Console when the remainder of dividing the check digit by 3 is 0.

(b) Console when the remainder of dividing the check digit by 3 is 1.

(c) Console when the remainder of dividing the check digit by 3 is 2.

Exercise 32 (file name "Exercise32.java")

Extend the "Exercise31.java" created in Exercise 31 and create Java program "Exercise32.java" which displays face areas in the image "imageE.jpg". The program "Exercise32.java" satisfies the following conditions.

(1) The window size is 560 pixels wide by 510 pixels vertical.

(2) Since the size of the image "imageL3.jpg" is 1080x720, draw it in half of the length. The upper left coordinates of the image to be drawn are (10, 30).

(3) The classifier is specified according to check digit as shown in Table 1. Use yellow color bordered rectangle to display the face area. Notice that the size of the image is halved in length.

(4) The extracted facial images are displayed under the original image. The extracted facial images are displayed with a size of 100 pixels wide and 100 pixels vertical. The upper left corner of the first image is (10, 400).

(5) The window whose size is 560 pixels wide by 510 pixels vertical is used, and the interval between the images is assumed 10 pixels, so, only five images can be drawn.

Refer "FaceExtraction.java" of "FourteenthDay.pdf" in "Programming Language".

Figure 3 shows the execution result of "Exercise32.java".

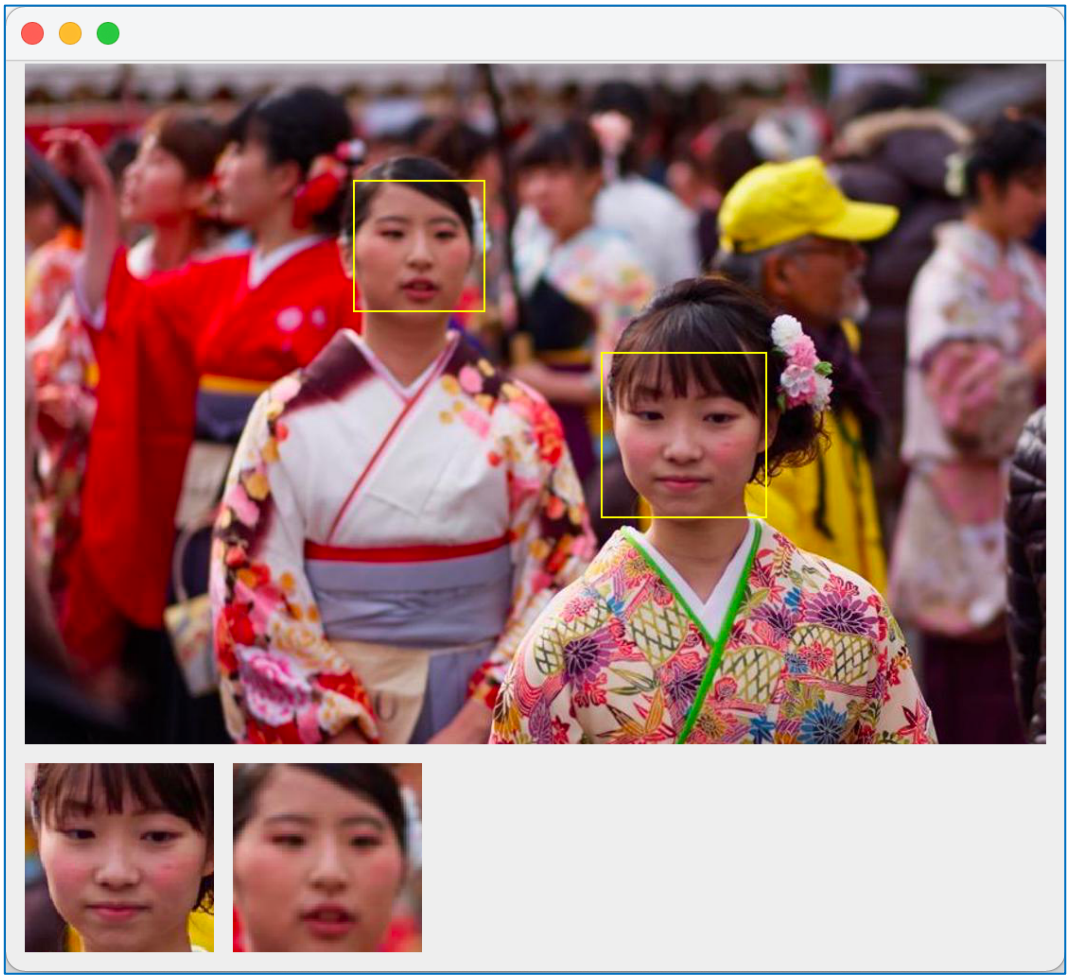


Figure 3. The execution result of “Exercise32.java”.