COMP3422 Creative Digital Media Design

Assignment 1 (15%)

[Deadline: 23:59:00 Tue 8th March 2016]

Form yourselves a group of TWO students (You can do this assignment on your own also). Nominate a group leader who will be the main contact point of each group. Group leader is responsible to send the group member list (full name in English and Student ID) to csdennis@comp.polyu.edu.hk by 3rd Feb 2016.

Background

JPEG is an image compression standard developed by the Joint Photographic Experts Group. It was formally accepted as an international standard in 1992 while nowadays it is still one of the most popular image formats. JPEG adopts lossy compression techniques to reduce the image size. It consists of a number of steps, including 2D DCT transformation, quantization, zigzag ordering, and lossless coding, each of which contributes to the compression. In this assignment, you are going to implement a JPEG image encoding/decoding program with a graphic user interface (GUI).

What you have to do

Implement a JPEG image encoding/decoding program. The program should accept at least one image file format (e.g., .bmp) and convert it to JPEG file format. Your program should allow the user to change the parameters before compression, For example, values in quantization tables of luminance and chrominance channels, and quality of the image (say, 1 – lowest, 10 – highest). Design your GUI so that the image before and after the conversion can be seen side by side for visual comparison. Include a section in the GUI to display relevant information regarding the images. For example, color histogram, size of the images, compression ratio. The program should also be able to export the compressed image and save it in the local file system.

You are free to choose any programming languages to build up your program. Some programming languages offers powerful library/API for creating JPEG application. For your reference:

JAVA - http://docs.oracle.com/javase/6/docs/api/javax/imageio/ImageIO.html
VB/C# - https://msdn.microsoft.com/en-us/library/bb882583(v=vs.110).aspx
Matlab - http://www.mathworks.com/matlabcentral/fileexchange/4328-jpeg-compression
Python - http://www.pythonware.com/products/pil/

Write a report which includes the followings:

a. Abstract;
b. Description of your program (e.g., programming language used, detailed function description, program structure);
c. Assumptions/limitations of the program;
d. A user manual for installation of the program;
e. Bibliography.

Only the major compulsory sections are listed above. You may include sub-sections so that your report is presented in a more systematic manner.

Report Format

Your report must NOT exceed 15 pages, excluding the cover page, the table of contents and appendices of supplementary documents (e.g., diagrams, figures, and screenshots), with single line spacing and font size 12. Use .doc/.docx/.pdf format for the report only. Use the APA or IEEE standard to format all citations.

Assessment

Your work is assessed with the following weighting distribution:

Criterion	Weighting
Program Functions and Correctness	60%
Report	40%

Submission

The deadline of this assignment is 23:59:00 Tue 8th March 2016. No late submission is allowed.

Only the **GROUP LEADER** submits the followings:

- a zip file for both the program and report to Blackboard (if the file is to large, burn it to CD/DVD);
- one HARDCOPY of the report.

This is a group project. Each group member must fill in the peer evaluation form. Each student has to rank the contribution of his/her group members, including himself/herself. Submit it individually to csdennis@comp.polyu.edu.hk. The aim of peer evaluation is to serve as a free-rider deterrent. In case of apparent inconsistency of ratings among group members, a special interview session may be arranged for the group. Students who fail to submit this form are subject to mark deduction.

An assignment collection box will be placed outside PQ730. Please put the hardcopy of your assignment into the box.

Plagiarism is a serious offence. Both copier and copiee will be given ZERO mark in this assignment and may be subject to disciplinary action (e.g., academic disqualified).

Peer Evaluation Form

Name:

Student No:

Group Members (Name)	**Effectiveness***				
	Not at all	**Poorly**	**Adequately**	**Well**	**Extremely Well**
<Me>					

* Put ✓ in appropriate boxes