SCHOOL OF COMPUTER SCIENCE & Informatics
COURSEWORK ASSESSMENT PROFORMA

TITLE: *Individual project work* – MATLAB Image Browser/Editor

MODULE & LECTURER: CM2202 Scientific Computing and Multimedia Applications, Prof A D Marshall & Dr Yukun Lai

DATE SET: Monday 16th February 2015
SUBMISSION DATE: Friday 1st May, 2015

SUBMISSION ARRANGEMENTS:
Submission of all material (Short Report and MATLAB code) by Midnight of Friday 1st May (Week 11, Semester 2) via Learning Central.

Details of the Learning Central Submission Procedure are outlined below.

This Individual project work is worth 30% of the total marks available for this module. The penalty for late or non-submission is an award of zero marks. You are reminded of the need to comply with Cardiff University's Student Guide to Academic Integrity. For full submission details, please see the following sheets.

INSTRUCTIONS
The Individual project work involves developing a MATLAB based Image Browser/Editor. You must supply a typeset report in PDF format — a short (3-4 pages) written description conveying all the appropriate information to demonstrate its operation and explain your programming philosophy is all that is required. You should also submit all MATLAB code as text files which should be zipped into a single file for submission. For complete details see the following sheets.

CRITERIA FOR ASSESSMENT
Marks will be apportioned as follow:
- *10 marks* are available for the basic satisfaction of the coursework requirements – Overview of solution, appropriate satisfaction of all the basic criteria for the exercise (specified below).
- *30 marks* are available for your solution to working system that **clearly demonstrates** a working functional system with suitable MATLAB implementations of basic exercise criteria.
- *30 marks* are available for a clear write up and demonstration of a working system in the lab classes of a fully working system. The write up should clearly state your design and implementation strategy.
- *30 marks* are available for your design and incorporation of other features and media **_beyond_** the basic coursework specification.

FURTHER DETAILS

Feedback on your coursework will address the above criteria.

The Individual project work will be returned via Grade Centre. Individual feedback will be given via Grade Centre.

This will be supplemented with oral feedback *in the revision lecture in Week 12 (TBC).*

Scientific Computing
and
Multimedia Applications
Module No: CM2202
Assessed Individual Project Work:
MATLAB Image Browser/Editor

Submission of Individual Project Work

- **Hand in Date**: Submission of all material (Short Report and MAT-LAB code) by Midnight of Friday 1st May (Week 11, Semester 2) via Learning Central.

- You **must** also get your coursework *‘signed off’* by the tutor to **verify** to what extent the programs work according to specification.
  Your must therefore demonstrate your working solution to the tutor in the *Week 11 Lab Classes*

- The tutor is only guaranteed to be available to sign at CM2202 Laboratory Sessions.

  - The Lab Tutor will make comments on your demonstration via Grade Centre.

  - The Lab Tutor plays no part in assigning any of the marks for this coursework

- The Individual Project Work is worth **100%** of the project component of the module,*i.e.* **30 Marks** for the whole module.

Submission Details

The Individual Project Work involves developing a MATLAB based Image Browser/Editor. You must supply a typeset hard copy solution & a short (3–4 pages) written description conveying appropriate information to demonstrate and explain your approach to developing the program handed in for this coursework.

You hard copy solution **must** include:

- A cover page that details the following:

  - Student No., Student Name, Module Code, Module Title, Coursework Title, Lecturer, Hours Spent on this Exercise, (Special Provision if applicable).

- A 3–4 page typeset PDF report detailing the following:

  - An overview of your program design and implementation.
  - A basic algorithmic description of the main elements of your solution and how they satisfy the basic requirement listed below.
  - You should explicitly highlight any novel features — i.e. those features developed beyond the basic requirements.

- In **_addition_** to the 3–4 page report, a copy of all MATLAB code should be provided.

  - Include all MATLAB files as text files.
  - MATLAB files should be submitted as a single zip file collection.

- **_Ensure_** that your student number and name are in **each** file that makes up your submission.

See the *Criteria for Assessment* for more details on the marking scheme.

Assessed Individual Project Work

You should aim to develop an **Image Browser/Editor** in MATLAB. Related applications that may influence aspects of your design include:

- iPhoto — basic functionality, display of images and some **simpler** aspects of image editing

- Simpler parts of Adobe Photoshop, Photoshop Elements, *etc.*

There are many more Image browsers /editors in existence that may also inspire aspects of your design.

The above are given as common examples of the kind of applications you can model your solution on. You are completely free to come up with your own, possibly *unique*, solutions.

The following basic requirements should be met in order to gain average to good marks:

- You should be able to **load** and display *image media* — a few formats

- You should develop an appropriate **GUI** (using MATLAB `guide`) for your application.

- You should provide a means for **organising** the media into appropriate *folders* or *albums* via *keywords/tags* that the program allows the user to associate with (or automatically determines) an image or a set of images.

- You should provide some basic means of altering or processing a displayed image, and save it.

    - You should be able to edit the colour or contrast.
    - You should be able to crop the image — *i.e.* extract a part of the image
    - **Three** more image editing features of your choice should also be available

In order to gain higher marks you need to add some novel extensions or additional features. You need only provide **three** further different *novel* extensions (such as those suggested overleaf).

There are endless possibilities here and you are encouraged to think of your own extensions. Here are a few suggestions:

- You could provide a means to index/tag and effectively search the media

- Additional image processing, *e.g.*:

  - Straightening or changing rotation of image

  - More advanced colour image processing

  - Other image processing tools (*e.g.* edge detection, filtering, blurring/deblurring, dithering)

  Hint: Consult MATLAB's Image Processing Toolbox (`doc/help images`) and look online for lots of examples.

  It is perfectly adequate to take advantage of the image processing routines supplied by the Image Processing Toolbox to satisfy the above requirements. *You do not necessarily need to implement image processing algorithms from scratch.*

- Advanced GUI layout/elements to control audio/image processing/editing and organising/sorting media.

Demonstrating your system

You will be required to demonstrate you final system in order to **verify** that the programs work according to specification. The tutor will sign off your system via Grade Centre in Learning Central. The tutor is only **guaranteed** to be available to sign at CM2202 Laboratory Sessions.

At the demo you will need to show your MATLAB code running and satisfying the above *basic requirements*. Clearly if you have any *additional features* in your system, it will be appropriate to demonstrate how these work and that they function accordingly.

Prof. David Marshall & Dr Yukun Lai. February 2015