ITCT HW1

A C-based jpeg baseline encoder & decoder, and is alos NTU course 資訊理論與編碼技巧 HW1.

You can check more detail on my github repo

Prerequirements

- use bitmap library to access bmp file.
  - this library is written in c++, so we should compile whole project using g++

How to use

Compile

- use `makefile` to compile all

```
$ make
```

- and you can specific decoder or encoder, even clean (delete)

```
$ make encoder # g++ -o encoder encoder.c -O3
$ make decoder # g++ -o decoder decoder.c -O3
$ make clean # rm decoder encoder
```

- or compile with g++

```
$ g++ -o decoder decoder.c -O3
$ g++ -o encoder encoder.c -O3
```

command example

- encoder: NOTICE that `input file` should be bmp, `output file` should be jpg
  - `output file` is optional, if you don't specify it, it would be `image.jpg`

```
$ ./encoder <input file> [output file]
```

- decoder: NOTICE that `input file` should be jpg, `output file` should be bmp
  - `output file` is optional, if you don't specify it, it would be `image.bmp`

```
$ ./decoder <input file> [output file]
```

- NOTICE that $ stands for command prompt.

environments

- already tested on my macOS and NTU CSIE server (Arch Linux), so any FreeBSD or Linux environments should be fine.
- more detail below:

```
$ g++ -v
Configured with: --prefix=/Applications/Xcode.app/Contents/Developer/usr --with-gxx-include-
dir=/Applications/Xcode.app/Contents/Developer/Platforms/MacOSX.platform/D
eveloper/SDKs/MacOSX10.14.sdk/usr/include/c++/4.2.1
Apple LLVM version 10.0.1 (clang-1001.0.46.4)
Target: x86_64-apple-darwin18.5.0
```

```
r07922009@linux9 [~/JPEG] g++ -v
使用內建 specs。
COLLECT_GCC=g++
COLLECT_LTO_WRAPPER=/usr/lib/gcc/x86_64-pc-linux-gnu/8.3.0/lto-wrapper
目的：x86_64-pc-linux-gnu
配置為：/build/gcc/src/gcc/configure --prefix=/usr --libdir=/usr/lib --
libexecdir=/usr/lib --mandir=/usr/share/man --infodir=/usr/share/info --
with-bugurl=https://bugs.archlinux.org/ --enable-
languages=c,c++,ada,fortran,go,lto,objc,obj-c++ --enable-shared --enable-
threads=posix --enable-libmpx --with-system-zlib --with-isl --enable-
__cxa_atexit --disable-libunwind-exceptions --enable-clocale=gnu --
disable-libstdcxx-pch --disable-libssp --enable-gnu-unique-object --
enable-linker-build-id --enable-lto --enable-plugin --enable-install-
libiberty --with-linker-hash-style=gnu --enable-gnu-indirect-function --
enable-multilib --disable-werror --enable-checking=release --enable-
default-pie --enable-default-ssp --enable-cet=auto
執行緒模型：posix
gcc version 8.3.0 (GCC)
```

Result

嘗試過許多種寫法後，發現都有一些瑕疵：偏暗以及模糊 (可參考如下)，最後我選擇繳交較為模糊但是顏色沒有偏掉者

可以參考我 github 的不同分支，可以看到不同的結果

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Rendered with RenderMan (R) from Pixar, Inc.

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