

Assignment 3 Result Report

通訊二 110503531 劉泰君

1.Compile Result

- Arithmetic

```
cornertw@DESKTOP-HD1IFP1:/mnt/c/Users/Max Liu/NCU_Documents/arcd$ make
[ 25%] Built target arcd
[ 50%] Built target adaptive_model
Scanning dependencies of target arcd_stream
[ 62%] Building C object examples/CMakeFiles/arcd_stream.dir/arcd_stream.c.o
[ 75%] Linking C executable arcd_stream
[ 75%] Built target arcd_stream
Scanning dependencies of target codec_tests
[ 87%] Building CXX object tests/CMakeFiles/codec_tests.dir/codec_tests.cpp.o
[100%] Linking CXX executable codec_tests
[100%] Built target codec_tests
```

- Huffman

```
cornertw@DESKTOP-HD1IFP1:/mnt/c/Users/Max Liu/NCU_Documents/huffman-main$ make
cc -g -Wall -Werror -Wextra -O0 -std=c11 -D_POSIX_C_SOURCE=2 -c -o huffcode.o huffcode.c
cc -o huffcode huffcode.o libhuffman.a
```

2.Execute Result

Arithmetic

- Encoding
- input file is “runarcd.txt” ,
- encoding file is “outputarcd.txt”

```
cornertw@DESKTOP-HD1IFP1:/mnt/c/Users/Max Liu/NCU_Documents/arcd/examples$ ./arcd_stream -e < runarcd.txt | tee outputarcd.txt
:d>Bs|yY@rt*jWKx1?
F@{6Jno
d7DH4X
; zI@^``bcen%=LjPV:2e@ns'zo(* YRum&[j]g#u|]0dYXw+?#Q Bo
X/_Kй.Ĳ;r/^62}T3QH1~{fĒē:J;a!x14MAMRQf~
1
(C:C=d#fñ!Z-T:*ŸbA$ñ+U|X-7Sc
ZE`UX +6saw1Bf*
Hgzy@~0wt5t:AP_ Ix0bxBZGEWbNj8}Io_Uhhr 3}eU0z7%ñüQnqJ_ēvU*ñTf;yby$JQCm1*&0C80 8 mo<n
@ h"壘47E~yIb:h>!U <7Cn7P?ZvyhBD[{+-q30e09x $ JF{
RbJYz^: ~7*Yqka@Ysm:OJ]iV,~kЛ`f[oz@48`!mi;
@A;'D uz(3M.PwHgV^Ir
!RloQikF @;mw]bVO-61"/
/:T$V17
M\`P\>3w~pN:
執行時間(毫秒): 238
```

- Decoding
- input file is “outputarcd.txt” ,
- decoding file is “decodingarcd.txt”

```
cornertw@DESKTOP-HD1IFP1:/mnt/c/Users/Max Liu/NCU_Documents/arcd/examples$ ./arcd_stream -d < outputarcd.txt | tee decodingarcd.txt
```

「隨著科技發展，無人機現在能執行許多任務，但電池更換都需要手動，本專案希望透過自動充電平台讓無人機可以有更長久、更廣闊的飛行時間與範圍，而不是必須在執行任務途中還要返回基地進行電池更換」；據外媒NewAtlas報導，大多數多旋翼無人機只能飛行30分鐘左右，之後電池需充電1到2小時，這大幅限制了它們的實際應用。雖然目前可用人力手動更換電池，但今日若需要一次出動大量的無人機，那耗費的時間和人力資源將相當龐大。另外天氣的狀況也會對電池的持續時間造成影響，大風會造成無人機電機更耗功率的運轉，濕氣也會造成無人機重量加重，導致電池消耗的加速，再來溫度的降低會造成電池中鋰聚合物的活性降低，從而導致無人機更快的失去電力。

為了解決此問題，本專案提出一個能夠普及的無人機充電平台概念，不僅能夠進行無人機的充電，也能與後端資料庫系統連接進行資料的分析計算，讓無人機未來能執行多元的任務並提升其調度和執行任務的效率，且將能更有效的運用無人機每一份珍貴的電力，使其發揮最大的價值。

```
執行時間(毫秒): 321
```

Huffman

- Encoding
- input file is “runhuff.txt” , encoding file is “outputhuff.txt”

```
cornertw@DESKTOP-HD1IFP1:/mnt/c/Users/Max Liu/NCU_Documents/DSA_project/huffmain/huffman-main$ ./huffcode -i runhuff.txt -o outputhuff.txt -c
```

```
執行時間(毫秒):1090.000000
```

- Decoding
- input file is “outputhuff.txt” ,decoding file is “runhuff.txt”

```
cornertw@DESKTOP-HD1IFP1:/mnt/c/Users/Max Liu/NCU_Documents/DSA_project/huffmain/huffman-main$ ./huffcode -i outputhuff.txt -o runhuff.txt -d
```

```
執行時間(毫秒):877.000000
```

3. Analysis

Because one of my classmates and I coded with longer data content and the other with shorter data, I found that Huffman coding is faster when processing large data, while arithmetic coding is faster when processing a small amount of data.