

Huffman

- **MakeFile**

\$make

```
janet@janet-nb:~/DSA/huffman$ make
cc -g -Wall -Werror -Wextra -O0 -std=c11 -D_POSIX_C_SOURCE=2 -c -o huffcode.o huffcode.c
cc -g -Wall -Werror -Wextra -O0 -std=c11 -D_POSIX_C_SOURCE=2 -c -o huffman.o huffman.c
ar r libhuffman.a huffman.o
ar: creating libhuffman.a
cc -o huffcode huffcode.o libhuffman.a
```

- **Run for encode**

```

$./huffcode -i (input_filename) -o (output_filename) -c

```

- **Run for decode**

```
./huffcode -i (input_file_name) -o (output_file_name) -d
```

Arcd

- **Makefile**

\$make

- **Run for encode**

```
$/arcd_stream -e < [input_file_name] | tee [output_file_name]
```

- **Run for decode**

```
$/arcd_stream -d < [input_file_name] | tee [output_file_name]
```

```

• janet@janet-nb:~/DSA/arcd/examples$ make
[ 33%] Built target arcd
[ 66%] Built target adaptive_model
[100%] Built target arcd_stream
• janet@janet-nb:~/DSA/arcd/examples$ ./arcd_stream -e < test_data/1_byte | tee encode_data/1_byte_e
A
total time : 0.000008s
• janet@janet-nb:~/DSA/arcd/examples$ ./arcd_stream -d < encode_data/1_byte_e | tee decode_data/1_byte_d
A
total time : 0.000015s

```

2.Result

因為huffman coding 一直出現重複定義的問題無法解決，無法得到huffman coding 的資料，有用別人的電腦跑過有用別人的電腦跑過，huffman coding 的數據是別人電腦得到的數據

Sizeof data	Huffman encode	Arcd encode	Huffman decode	Arcd decode
1 byte	0.000033	0.000008	0.000008	0.000015
2byte 1syb	0.000020	0.000014	0.000009	0.000016
2byte 2syb	0.000019	0.000071	0.000010	0.000007
3byte 1syb	0.000022	0.000039	0.000008	0.000007
3byte 3syb	0.000025	0.000030	0.000010	0.000013
3 line	0.000033	0.000054	0.000011	0.000019
128byte 1syb	0.000027	0.000025	0.000010	0.000032
122byte 2syb	0.000037	0.000015	0.000011	0.000017

3.problem

```
janet@janet-nb:~/DSA/huffman$ make
cc -o huffcode huffcode.o libhuffman.a
/usr/bin/ld: libhuffman.a(huffman.o):/home/janet/DSA/huffman/huffman.h:8: multiple definition of `start_t'; huffcode.o:/home/janet/DSA/huffman/huffman.h:8: first defined here
/usr/bin/ld: libhuffman.a(huffman.o):/home/janet/DSA/huffman/huffman.h:8: multiple definition of `end_t'; huffcode.o:/home/janet/DSA/huffman/huffman.h:8: first defined here
collect2: error: ld returned 1 exit status
make: *** [Makefile:16: huffcode] Error 1
```

huffman coding: 一直出現重複定義的問題無法解決

Conclusion

- 1.Huffman coding runs faster when processing big size data.
- 2.Arithmetic coding runs faster when processing small size data.
- 3.Both coding runs faster when decoding, slower when encoding.