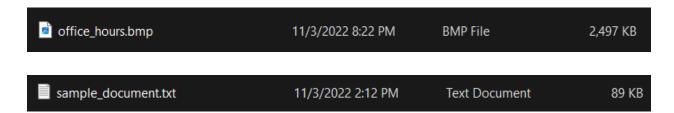
The original size of the bmp file was 2,497 kb, and the original size of the txt file was 89kb.



After running our compression algorithm on both files, we get a noticeable difference in size from the original and different ratios of compression depending on whether or not we enable the -b flag.

## Office\_hours.bmp Compress/Decompress (-b flag enabled)

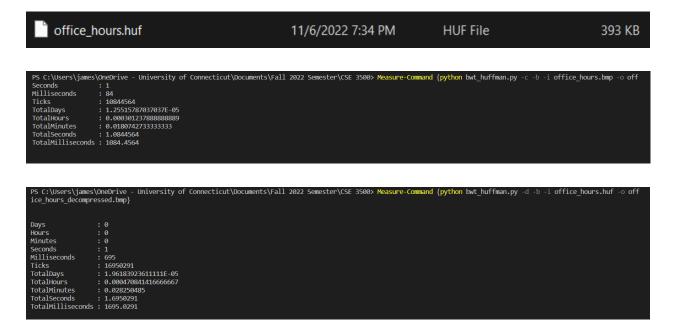


Image Compression Ratio: 393 / 2497 = 84%

Image Compression Time: 1084 ms

Text Document Decompression Time: 1695 ms

Office hours.bmp Compression (-b flag disabled)

Image Compression Ratio: 340 / 2497 = 86%

Image Compression Time: 509,248 ms

Image Decompression Time: Took too long

### Sample\_document.txt Compress/Decompress (-b flag enabled)

sample\_document.huf 11/7/2022 12:51 PM HUF File 53 KB

PS C:\Users\james\OneOrive - University of Connecticut\Documents\Fall 2022 Semester\CSE 3500> Measure-Command{python bwt\_huffman.py -c -i sample\_document.txt -o sample\_document.huf}

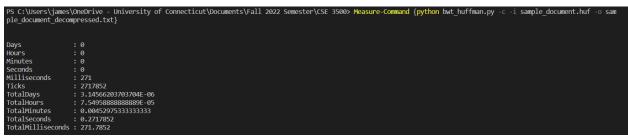
Days : 0
Hours : 0
Minutes : 0
Seconds : 0
TotalMilliseconds : 445.1311

Text Document Compression Ratio: 53 / 89 = 40%

Text Document Compression Time: 212 ms

Text Document Decompression Time: 192 ms

Sample document.txt Compression (-b flag disabled)



```
PS C:\Users\james\OneDrive - University of Connecticut\Documents\Fall 2022 Semester\CSE 3500> Measure-Command {python bwt_huffman.py -d -i sample_document.huf -o sam ple_document_decompressed.txt}

Days : 0
Hours : 0
Minutes : 1
Seconds : 10
Milliseconds : 658
Ticks : 706588589
TotalDays : 0.000817810866898148
TotalHours : 0.0196274608055556
TotalMinutes : 1.17764764833333
TotalSeconds : 70.6588589
TotalMilliseconds : 70.6588589
```

Text Document Compression Ratio: 37 / 89 = 58%

Text Document Compression Time: 271 ms

Text Document Decompression Time: 70,658 ms

When comparing our compression algorithm with others such as ZIP, RAR, BZIP2, GZIP, we see that while our compression ratio is quite big, it is not nearly as good as theirs. But that can be due to the fact that our implementation was not perfect, the ones described before are quite industry standards, so they have to be up to par, the best of all of them being BZIP2.

#### **ZIP**

office_hours.zip	11/6/2022 7:29 PM	Compressed (zipp	55 KB
sample_document.zip	11/6/2022 7:30 PM	Compressed (zipp	35 KB

Image Compression Ratio: 55 / 2497 = **97%** 

Text Document Compression Ratio: 35 / 89 = 60%

### **RAR**

office_hours.rar	11/6/2022 7:16 PM	WinRAR archive	43 KB
sample_document.rar	11/6/2022 7:16 PM	WinRAR archive	35 KB

Image Compression Ratio: 43 / 2497 = **98%** 

Text Document Compression Ratio: 35 / 89 = 60%

### **BZIP2**

office_hours.bmp.bz2	11/6/2022 5:32 PM	WinRAR archive	26 KB
sample_document.txt.bz2	11/6/2022 7:38 PM	WinRAR archive	29 KB

Image Compression Ratio: 26 / 2497 = **99%** 

Text Document Compression Ratio: 29 / 89 = 67%

# **GZIP**

office_hours.bmp.gz	11/6/2022 7:40 PM	WinRAR archive	59 KB
sample_document.txt.gz	11/6/2022 7:40 PM	WinRAR archive	35 KB

Image Compression Ratio: 59 / 2497 = 98%

Text Document Compression Ratio: 35 / 89 = 60%