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[https://github.com/Redster11/CS\\_3700/tree/master/Project1](https://github.com/Redster11/CS_3700/tree/master/Project1)

1a) the file size is 43.7 KB (44,841 bytes)

1aa) average of .5ms

1ab) average of 10ms

1c) 300%

1d) the second method gives better compression however it takes 35ms which is a 1.3 speed up in time taken.

1e) no because it requires all the codes and to know how many letters have been decoded so far

```
PracticeCode > Run | Debug
Project1.java > Project1 > main(String[])

268 public static void main(String[] args) throws FileNotFoundException
269
270     String test = "ABCD12345";
271     System.out.println("Original Text = " + test);
272     String s = encode(test);
273     System.out.println(s);
274     System.out.println("The size of the original file is: 44.0 KB (45,056 bytes)");
275     String filePath = null;
276     String filePath = "D:\\GitHub\\PracticeCode\\const.txt";
277     File = Project1.readFile(filePath);
278     EncoderThread encodeThread = new EncoderThread(File);
279     encodeThread.run();
280     WriteStringThread writer = new WriteStringThread(encodeThread.Encoded, Project1.numLines);
281     writer.run();
282     //BlockingQueue<String> queue = new ArrayBlockingQueue<>(1024);
283     //ReaderThread reader = new ReaderThread(queue, encodeThread.Encoded);
```

PROBLEMS 9 OUTPUT DEBUG CONSOLE TERMINAL 2: Java Debug Console +

```
Char Prefix Map = {1=000, A=1000, 2=101, B=1111, 3=011, C=1110, 4=001, D=010, 5=1001, %=110}
10001111111001000010111010101010011001
The size of the original file is: 44.0 KB (45,056 bytes)
Start Encoding...23:22:04.537490700
Char Frequency Map = {
=865, =6922, "-2, (=5, )=5, ,=586, -=37, .-=197, 0=4, 1=32, 2=29, 3=15, 4=10, 5=8, 6=6, 7=5, 8=3, 9=3, :=12, ;=88, A=119, B=42, C=213, D=42, E=51, F=14, G=19, H=49, I=51, J=44, K=2, L=67, M=62, N=58, O=51, P=216, Q
=4, R=85, S=322, T=150, U=94, V=59, W=33, Y=26, a=2551, b=568, c=943, d=1181, e=5833, f=1005, g=424, h=1974, i=2364, j=52, k=51, l=1419, m=667, n=2549, o=2658, p=547, q=42, r=2108, s=2339, t=3573, u=748, v=395, w=3
39, x=96, y=477, z=31}
Char Prefix Map = {
=101110, =110, "-101111111111010, %=110, (-1010000001101, )=101000000111, ,=000111, -=1010000000, .-=1010100, 0=101111111111100, 1=0100100000, 2=101111110011, 3=101111111110, 4=10100011000, 5=1011111111111, 6=1011
000110011, 7=1010000001110, 8=1010001100100, 9=1010001100101, :=1011111100100, ;=10100000, A=1011111110, B=1010000010, C=101111100, D=1010000011, E=1011010101, F=101111100101, G=10100000010, H=1011000111, I=1011010
111, J=101000011, K=10111111111011, L=010010001, M=1011111110, N=1011111010, O=1011010100, P=10111101, Q=1010000001100, R=101000010, S=0100101, T=01001001, U=101100001, V=10111111011, W=0100100001, Y=1010001101,
a=1000, b=000110, c=111100, d=01000, e=011, f=111101, g=1011011, h=11111, i=0011, j=101111000, k=1011010110, l=10101, m=010011, n=0101, o=1001, p=000101, q=1010000110, r=0000, s=0010, t=1110, u=101001, v=1011001,
w=1010001, x=101100010, y=000100, z=101111111110}
End Encoding...23:22:04.572468
Total Time taken: 33 ms
PS D:\GitHub>
```

This is showing an output of the encoding for the entire file shows the Prefix Map and the Frequency Map.

It also shows a small test case.

```

PS D:\GitHub> cd 'd:\GitHub'; & 'C:\Users\Master\.vscode\extensions\ms-vscode.cmake-tools\bin\cmake' -Dfile
t=dt_socket,server=n,suspend=y,address=localhost:54515' '-Dfile
Original Text = ABCD12%%2345
1000111111100100001011101101010110011001
The size of the original file is: 44.0 KB (45,056 bytes)
Start Encoding...00:05:10.903349500
End Encoding...00:05:10.943319800
Time taken to write the new String was: 40
PS D:\GitHub>

```

Showing this time of using a String as an input for saving future

```

PS D:\GitHub> cd 'd:\GitHub'; & 'C:\Users\Master\.vscode\extensions\ms-vscode.cmake-tools\bin\cmake' -Dfile
t=dt_socket,server=n,suspend=y,address=localhost:54551' '-Dfile
Original Text = ABCD12%%2345
1000111111100100001011101101010110011001
The size of the original file is: 44.0 KB (45,056 bytes)
Start Encoding...00:08:50.563201400
End Encoding...00:08:50.598176200
Time taken to write file2 was: 33
Time taken to write file2 was: 49
PS D:\GitHub> cd 'd:\GitHub'; & 'C:\Users\Master\.vscode\extensions\ms-vscode.cmake-tools\bin\cmake' -Dfile
t=dt_socket,server=n,suspend=y,address=localhost:54555' '-Dfile
Original Text = ABCD12%%2345
1000111111100100001011101101010110011001
The size of the original file is: 44.0 KB (45,056 bytes)
Start Encoding...00:09:02.027700600
End Encoding...00:09:02.061677800
Time taken to write file2 was: 31
Time taken to write file1 was: 40
PS D:\GitHub>

```

Showing time comparison between the buffer String and the String