ECE 499/599 Data Compression/Information Theory
Spring 06

Dr. Thinh Nguyen

Homework 4
Due 05/23/06 at the beginning of the class

Implement Burrow-Wheeler Compression (20pts):

For ECE499:

Implement:

1) Burrow-Wheeler Transform (encoder)
2) Burrow-Wheeler Inverse Transform (decoder)

Test your transform on block sizes of 1K, 2K, 4K.

For 599:
Implement:

1) Burrow-Wheeler Transform (encoder)
2) Burrow-Wheeler Inverse Transform (decoder)
3) Move to Front Algorithm (MTF) at encoder
4) Move to Front Algorithm at decoder

Test your transform on block sizes of 1K, 2K, 4K.

For extra credits (all students):

Implement a simple but complete Burrow-Wheeler Compression and Decompression
Algorithms (Bonus points depends on how far you get).

Use the input block of 1K, 2K, and 4K to compress the provided text file, and plot the
provided the compression ratio when apply to the provided text. Make sure to decode the file
to verify your program's correctness.

You can write your program in any language. Just email me the executable file and
instruction on how to run the compression and decompression. The compression executable
should have parameters for inputting the buffer size.

We assume that the decoder does not know anything. The encoder has to encode every bit of
information such as the block size and include it in the encoded file. The encoder also needs

to take care of the case when the size of the input file is not the multiple of the block size. This is your own design.

Challenge: Can your algorithm beat gzip or winzip when compressing the provided text? You can make the block size as big as the input file.