Compile LZ:

g++ -std=c++11 encoder.cpp -o LZ

Compile EXPAND:

g++ -std=c++11 decoder.cpp -o EXPAND

Data Structures:

Prefix array for KMP algorithm, which can find the longest match in O(n+k) time.

A queue with fixed length, which can help me easily implement window shift operation.

Worst-case time usage:

$$\text{Find longest match} = 2^N$$

$$\text{Write a token into output} = 1 + \mathrm{S} + 8(2^S - 1)$$

Average-case time usage:

$$\text{Find longest match } = 2^N - 2^L$$

$$\text{Write a token into output} = \frac{2\mathrm{L} + \mathrm{S} + 8(2^S - 1) + \mathrm{N}}{2}$$

	Best compression (Bytes)	N, L, S combination	Encoding time (Seconds)	Decoding time (Seconds)
Book1	359317	14, 3, 2	48.779	72.728
Kennedy.xls	301820	9, 4, 1	1.389	2.089