Brandon Kinard PM2 HW 6

Problem 1a)

Index	0	1	2	3	4	5	6	7	8	9
Value	1400, 8980	3341, 4321	7652	1093	5674					

Problem 1b)

Index	0	1	2	3	4	5	6	7	8	9
Value	1400	3341	7652	1093	4321	5674	8980			

Problem 3a)
The height of the trie is 8.

Problem 3b)
If we insert the values in order the height of the trie is 8.

Problem 3c)
Insertion order: 'LOST' 'FOOTBALL' RUTGERS' 'HAS' 'NINE' 'GAMES' will generate the minimum height. The height will be 9.

Problem 3d)
If we insert the values in reverse alphabetical order we will get the maximum height.
The height will be 12.

Problem 4)
It will create a problem for decoding and encoding. Because a string of bits may have multiple meanings, it will be hard to create a huffman tree.

Problem 5a)
Best case: The best case is when 128 identical characters follow each other, this is compressed into 2 bytes instead of 128 giving a compression ratio of 64.
Worst Case: The next character in the string is always different than the current character.
Every 127 bytes will require a extra byte to indicate a new literal run length.

Problem 5b)
Worst case: When one character has a very high frequency and the rest are low frequency.
Best case: Every character appears with equal frequency

Problem 5c)
Worst case: A short message with no patterns. Compression ratio would be 1/B,
Best case: A long message with many patterns. Compression ratio would be B

Problem 6)
LZW Compression: 41 42 81 43 44 46 87 84

key	AA	AB	BA	AC	CD	DF	ABA
value	81	82	83	84	85	86	87