**IS 471: Spring 2020**

**Homework 4: Due 3/6/2020**

Please write your code in R as an RMD file and submit your script and results for each of the following.

1. Create an integer vector S with values from 1-5. Swap elements 1 and 4. [Hint: use the swap() function in package **seqinr**. ( 10 points)
2. Create a binary stream of bits for the string "Parabola". (10 points)
3. Create an initialized S vector for RC4. (10 points)
4. Create an initialized K vector for RC4. Assume that key is the UTF8 code of "Complete". (10 points)
5. Using the RC4 algorithm randomize S with 256 iterations. (10 points)
6. Using the RC4 algorithm generate a key stream of 128 bits starting with the output vector S in question 4. Assume that the key is "Complete". (15 points)
7. Implement RC4 for generating key streams. You function should contain two parameters: a seed and a key length. (20 points)
8. Create an encryption function using RC4 that takes a plain text and a key text as input and returns an encrypted stream of bits as output. (5 points)
9. Create a decryption function using RC4 that takes a cipher as a stream of bits and a key text as input and returns an encrypted stream of bits as output. (5 points)
10. Create a function that takes a binary stream as input and returns the corresponding text. (5 points)