Encryption:

1) Define a fixed length Key string
2) Find total of ascii values of characters in key string.
3) Find length of key string
4) Right circular shift total (from step 2) by number of bits equal to length (from step 3)
5) The final value in step 4 is shift value.
6) Take the last digit of shift value.
7) For the characters at odd places in the input string, take the character on the right side (circular shift) after number of shifts equal to last digit value in step 6.
8) For the characters at even places in the input string, take the character on the left side (circular shift) after number of shifts equal to last digit value in step 6.
9) Increment shift value by the number of current character to be encrypted.
10) Follow steps 6-9 till end of string is reached.
11) Store position of each space and number of spaces at the end of string.

Example:

Key String : “Encrypt”
Input : “Hello World”

total of ascii values of characters in key string = 741
length of key string = 7
Right circular shift total by number of bits equal to length : Shift bits in 741 to right side by 7
New value = 813
Last digit = 3

Character	H	e	L	l	O		W	o	r	l	d
Position	Even	Odd	Even	Odd	Even	Odd	Even	Odd	Even	Odd	Even
Shift value	813	814	815	816	817	818	819	820	821	822	823
Last digit	3	4	5	6	7	8	9	0	1	2	3
Encrypted Charatcer	E	i	g	r	H		N	o	q	n	a

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

Number of spaces = 1
Position of space = 5

Encrypted String = EigrhNoqna15

Decryption:

1) Define a fixed length Key string (It should be same as used for Encryption).
2) Last character in string is number of spaces. From the end of string, remove characters equal to number of spaces.
3) Put the spaces at correct location from trimmed characters in step 7.
4) Find total of ascii values of characters in key string.
5) Find length of key string
6) Right circular shift total (from step 2) by number of bits equal to length (from step 3)
7) The final value in step 6 is shift value.
8) Take the last digit of shift value.
9) For the characters at odd places in the input string, take the character on the left side (circular shift) after number of shifts equal to last digit value in step 8.
10) For the characters at even places in the input string, take the character on the right side (circular shift) after number of shifts equal to last digit value in step 8.
11) Increment shift value by the number of current character to be encrypted.
12) Follow steps 8-11 till end of string is reached.

Example:

Key String : “Encrypt”
Input : “EigrhNoqna15” (Encrypted input string)
Number of spaces = 1
Position of space = 5
Input string with spaces: Eigrh Noqna
total of ascii values of characters in key string = 741
length of key string = 7
Right circular shift total by number of bits equal to length : Shift bits in 741 to right side by 7
New value = 813
Last digit = 3

Encrypted Character	E	i	g	r	H		N	o	q	n	a
Position	Even	Odd	Even	Odd	Even	Odd	Even	Odd	Even	Odd	Even
Shift value	813	814	815	816	817	818	819	820	821	822	823
Last digit	3	4	5	6	7	8	9	0	1	2	3
Decrypted Charatcer	H	E	L	L	O		W	o	r	l	D

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

a b c d e f g h i j k l m n o p q r s t u v w x y z

Decrypted String = Hello World

Text Stenograph:

Method 1

1) Take the encrypted string.
2) Convert each alphabet into its ascii values.
3) Convert ascii value into 8-bit binary value.
4) Implement binary value in the form of number of spaces between words in the cover text input by user.
   Binary 1 = 1 space
   Binary 0 = 2 spaces continuous.
5) Minimum number of words required in cover text is calculated by:
   Number of characters in encrypted string * 8 + 1

   Encrypted String: Eigrh

Characters	E	i	g	r	h
Ascii Value	69	105	103	114	104
8-bit Binary Value	01000101	01101001	01100111	01110010	01101000

   Number of Words required = 5 * 8 + 1 = 41

   Covertext: The advantage of steganography over cryptography alone is that the intended secret message does not attract attention to itself as an object of scrutiny. Plainly visible encrypted messages, no matter how unbreakable they are, arouse interest and may in themselves be incriminating in countries in which encryption is illegal.

   Stenographed Text:
   The<space><space>advantage<space>of<space><space>steganography<space><space>over<space><space>cryptography<space>alone<space><space>is<space>that the intended secret message does not attract attention to itself as an object of scrutiny. Plainly visible encrypted messages, no matter how unbreakable they are, arouse interest and may in themselves be incriminating in countries in which encryption is illegal.

   The <space> text is position of binary 1 and <space><space> is of binary 0. In the stenographed text above, we have shown binary value of E in the cover text. Same way for other letters is also implemented.

Information retrieval from Stenographed Text (Text De-stenograph):

1) Take the stenographed text as input.
2) Count number of spaces between adjacent words successively and assign binary values to it.
3) For 2 continuous spaces, assign binary 0 and for 1 space assign binary 1.
4) Form groups of 8 binary bits successively.
5) Convert 8 bits binary into decimal number.
6) Consider the converted decimal number as asci value and take the character representation of it.
7) In the same way form characters.
8) Pass the string to decryption.

Stenographed Text input:
The<space><space>advantage<space>of<space><space>steganography<space><space>over<space><space>cryptography<space>alone<space><space>is<space>that the intended secret message does not attract attention to itself as an object of scrutiny. Plainly visible encrypted messages, no matter how unbreakable they are, arouse interest and may in themselves be incriminating in countries in which encryption is illegal.

Binary value assigned text:
The0advantage1of0steganography0over0cryptography1alone0is1that the intended secret message does not attract attention to itself as an object of scrutiny. Plainly visible encrypted messages, no matter how unbreakable they are, arouse interest and may in themselves be incriminating in countries in which encryption is illegal.

8 bit Binary number: 01000101
Decimal number: 69
Ascii value: 69
Character: E

In the same way encrypted string is recovered from stenographed text: Eigrh
Pass this string to decryption function to recover actual input: Hello

Text Stenograph:

Method 2:

For the method 2, each alphabet is assigned with a keyword in the app. User will be shown these keywords and asked to enter a sentence containing these keywords anywhere in the sentence but in the order of encrypted string.

Example:

1) Encrypted string : Eigrh
2) Assume keyword assigned to each alphabet is:

Character	E	i	g	r	h
Keyword	advantage	that	does	not	how

3) The keyword should not be repeated so every keyword should be unique.
4) User will be asked to enter a text containing words advantage, that, does, not, and how sequentially but at any place.

   Stenographed text :
   The advantage of steganography over cryptography alone is that the intended secret message does not attract attention to itself as an object of scrutiny. Plainly visible encrypted messages, no matter how unbreakable they are.

For Text De-stenograph:

1) Take the stenographed text as input.
2) Traverse the text to search for the keywords.
3) Take the alphabet assigned for each keyword and form the string to decrypt.

   Stenographed text :
   The advantage of steganography over cryptography alone is that the intended secret message does not attract attention to itself as an object of scrutiny. Plainly visible encrypted messages, no matter how unbreakable they are.

   Keywords in sequential order:

advantage	that	does	not	how
E	i	g	r	h

   Pass this string to decryption function to recover actual input: Hello