

Affine Cipher – Programming Directions

Goal: Write VBA code within Microsoft Word, which will enable a user to encrypt and decrypt using an affine cipher.

- Encryption
 - Inputs
 - a for the equation $c = (a p + b) \bmod 26$
 - b for the equation $c = (a p + b) \bmod 26$
 - Plaintext
 - Output – ciphertext
 - Include code to check for the condition that the GCD of a and 26 is 1. The program should stop and display a message if this condition is not met.
 - Assumptions that you can make: the plaintext is all lowercase, has no punctuation, and no spaces.
- Decryption
 - Inputs
 - a for the equation $c = (a p + b) \bmod 26$
 - b for the equation $c = (a p + b) \bmod 26$
 - Ciphertext
 - Output – plaintext
 - Include code to calculate a^{-1} for use in the equation $c = (a^{-1}(c - b)) \bmod 26$.
- Other things to include
 - Appropriate use of tab in the code (organization).
 - Appropriate documentation (comments) in the code
 - You may not use anyone else’s code or logic in your program.
 - Instructions for using the program and a method of launching the VBA code
- Extra Credit
 - Removes spaces and punctuation for plaintext.
 - Changes plaintext to all lowercase.
- Email
 - Email to: evans@scienceandmathacademy.com
 - Subject: *YourLastName* – Affine
 - Filename: *YourLastName_Affine.doc*

Grading:

Correctly prompts and handles inputs	/4
Properly encrypts a passage using Affine cipher	/20
Properly decrypts a passage using Affine cipher	/10
Includes error checking for “ a ”	/3
Routine calculates a^{-1} correctly	/4
Appropriate use of tab (organization)	/2
Appropriate use of documentation	/2
Emails assignment correctly	/1
Instructions and method for launching program	/4
Total	/50