

Math 495R Homework 8

- (1) Project Euler, problem 9.
- (2) Project Euler, Problem 16.
- (3) The Vigenère cipher is a variant of the shift cipher. Its key is a list of integers between 0 and 25; often, the entries correspond to the letters of some key word. To encrypt a message using the key $KEY = 10\ 4\ 24$, we shift the first letter of the message by 10, the second letter of the message by 4, the third letter by 24, the fourth letter by 10, the fifth by 4, and so on, starting again at the beginning of the key after reaching the end. These shifts can be represented by addition modulo 26 after converting the message to a string of numbers between 0 and 25.

Write two functions `vigenere_encrypt` and `vigenere_decrypt` that take a keyword (written as a string of capital letters) of arbitrary length and a message (written as a string of capital letters) and encrypt or decrypt the message using that keyword. You should probably use your shift cipher functions from a previous assignment. Test your decryption function by using the keyword `NEPHI` to decrypt the string `GLTYMVWCVBUMCNEUMROQFWTJZRXXHDMIZPNPAIMEIKLIYIS` .