Cryptography: Homework 1

(Deadline: 11:59am, 2019/09/25)

Justify your answers with calculations, proofs, and programs.

1. (20 points) Suppose that the following ciphertext c is generated using the substitution cipher.

   ```
   EMGLOSUDCGDNCUSWYSFHNSFCYKDPUMLWGYICOXYSIPJCKQPKUGKMGOLICGINCGACKSNISACYKZSCKX
   ECJCKSHYSXCGOIDPKZCNKSHICGIWYGKKGKGOLDSILKGOIUSIGLEDSPWZUGFZCCNDGYYSFUSZCNXEOJ
   NCGYEOWEUPXEZGACGNFGLKNSACIGOIYCKXCJUCIUZCFZCCNDGYYSFEUEKUZCSOCFZCCNCIACZEJNCS
   HFZEJZEGMXCYHCJUMGKUCY
   ```

   Determine the plaintext m and the secret key σ.

2. (20 points) Suppose that the following ciphertext c is generated using the Vigenère cipher.

   ```
   KCCPKBGUFDPHQTYAVINRRTMVGRKDNBVFDETDGILTXRGUDDKOTFMBPVGEGLTGCKQRACQCWDNAWCRXIZ
   AKFTLEWRPTYCQKYVXCHKFTPONCQQRHJVAJUWETMCMSPKQDYHJVDAHCTRLSVSKCGCZQQDZXGSFRLSWC
   WSJTBHAFSIASPRJAHKJRJUMVGKMITZHFPDISPZLVLGWTFPLKKEBDPGCEBSHCTJRWXBAFSPEZQNRWXC
   VYCGAONWDDKACKAWBBIKFTIOVKCGGHJVLNHIFFSQESVYCLACNVRWBBIREPBBVFEXOSCDYGZWPFDTKF
   QIYCWHJVLNHIQIBTKHJVNPIST
   ```

   Determine the plaintext m and the secret key k.