Cryptography: Homework 2

(Deadline: October 11, 2018)

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

   ```
   CHREEVOAHMAERATBIAXXWTNXBEEOPHBSBQMQEQERBWRVXUOAKXAOSXXWEAHBWGJMMQMNKGRFVGXWTRZ
   XWIAKLXFPSKAUTEMNDCMGTSXMXBTUIADNGMGPSRELXNJELXVRVPRTULHDNQWTWDTYGBPHXTFALJHASV
   BFXNGLLCHRZBWELEKMSJIKNBHWRJGNMGJSGLXFEYPHAGNRBIEQJTAMRVLCRREMNDGLXRRIMGNSNRWCH
   RQHAEYEVTAQEBBIPEEWEVKAKOEWADREMXMTBHHCHRTKDNVRZCHRCLQOHPWQAIIWXNRMGWOIIFKEE
   ```

   Try to find the plaintext and the secret key.

2. (10 points) Let $E_1, \ldots, E_n$ be n events. Show that

$$\Pr[\cup_{i=1}^{n} E_i] \leq \Pr[E_1] + \sum_{i=2}^{n} \Pr[E_i | \bar{E}_1 \cap \cdots \cap \bar{E}_{i-1}].$$