

Cryptography Worksheet

This document presents the same example cryptography challenges that are presented in the virtual robot environment. The

Legend:

* = Easy

** = Medium

*** = Difficult

Encode the following messages:

***1. Caesar cipher with a shift key of 4**

Plaintext: I LOVE MESA

***2. Caesar cipher with a shift key of 21**

Plaintext: PROGRAMMING

****3. Vigenere cipher with a keyword of MESA**

Plaintext: RAVENS

****4. Simple Transposition Cipher with keyword: cat**

Plaintext: OCEAN CITY

***5. Caesar cipher with a shift key of 7**

Plaintext: MARYLAND BLUE CRABS

*** 6. Caesar cipher with a shift key of 2**

Plaintext: INNER HARBOR IN BALTIMORE CITY

Decode the following messages:

****1. Use the Caesar cipher with a shift key of 2**

Ciphertext: EQORWVGTUEKGPEG

***2. Use the Caesar cipher with a shift key of 2**

Ciphertext: OCTANCPFJCUVJGDGUVETCDECMGU

****3. Use the Caesar cipher with a shift key of -3**

Ciphertext: QEBZFMEBOEXPYBBKYOLHBK

*****4. Use the Vigenere cipher with the keyword: bad**

Ciphertext: XJVWT

****5. Use the Vigenere cipher with the keyword: team**

Ciphertext: WMFFUUFNEJCNS

*****6. Use the Vigenere cipher with the keyword: byte**

Ciphertext: INNJTOM

*****7. Use Simple Transposition cipher with the keyword: lions**

Ciphertext: HPSSRTIABSETTAIHNYECREOK

*****8. Use the Simple Transposition cipher with the keyword: cyber**

Ciphertext: EGPNIMANXETRRTTUAIIHYETDIC

Public/Private Key:

****1. Decrypt ciphertext message 15 with a private key of (44,19) and the public key of (44,7)**

*****2 . Encrypt plaintext 89 which represents the word HI using the following integer values:**

$$a_1 = 1, b_1 = 2, a_2 = 3, \text{ and } b_2 = 5$$

Cryptography Worksheet Solutions

Encode the following messages:

1. Caesar cipher with a shift key of 4

Ciphertext: MPSZIQIWE

2. Caesar cipher with a shift key of 21

Ciphertext: KMJBMVHHDIB

3. Vigenere cipher with a key word of MESA

Ciphertext: EFOFAX

4. Simple Transposition with the keyword: cat

Ciphertext: CNTOAIECY

5. Caesar cipher with a shift key of 7

Ciphertext: THYFSHUKISBLJYHIZ

6. Caesar cipher with a shift key of 2

Ciphertext: KPPGTJCTDQTKPDCNVKOTGEKVA

Decode the following messages:

1. Caesar cipher with a shift key of __2__

Plaintext : COMPUTER SCIENCE

2. Caesar cipher with a shift key of __2__

Plaintext :MARYLAND HAS THE BEST CRAB CAKES

3. Vigenere cipher with key word of team

Plaintext : CHEASAPEAKE BAY

4. Vigenere cipher with key word of byte

Plaintext : GO TERPS

5. Simple Transposition cipher with the keyword: lions

Plaintext : THIS CIPHER ISNT EASY TO BREAK

6. Simple Transposition cipher with the keyword: cyber

Plaintext : MEET U AT GRAND PRIX IN THE CITY

Public/Private Key:

- 1. Decrypt ciphertext message 15 with a private key of (44,19) and the public key of (44,7)**

Plaintext : 21

- 2. Encrypt plaintext 89 which represents the word HI using the following integer values:**

$$a_1 = 1, b_1 = 2, a_2 = 3, \text{ and } b_2 = 5$$

Ciphertext: 5