



**The Islamic University**  
**College of Technical Engineering**  
**Department of Computer Technical Engineering**



**Fourth Stage**

***Security***

**Lecture 7**

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# Lecture objectives

**The student will recognize the following objectives:**

- **Transposition Techniques**
- **Encryption and Decryption using Row -Column Cipher.**

## 2. Row – Column Technique

Alice



Sender

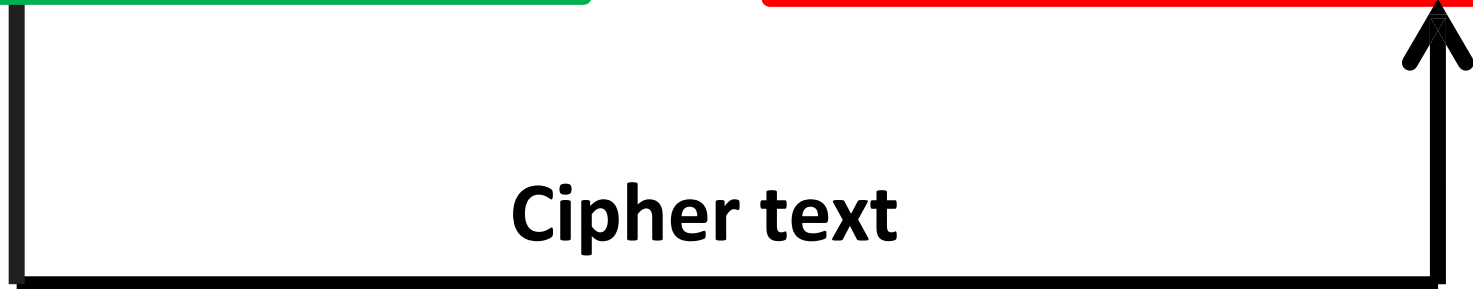
Bob



Receiver

Depends on the arrangement of the numbers in the Key  
**Encryption**

Depends on the arrangement of the numbers in the Key  
**Decryption**



Cipher text

## 2. Row – Column Technique

A more complex scheme is to write the message in a rectangle the name of this technique is row by row, and read the message off column by column but permute the order of the columns. The order of the columns then becomes the key to the algorithm.

### Example 1

Encrypt and decrypt the message “**hello bop**” by using Row by Column Technique with the **Key 52143**.

Ans:-

#### 1. Encryption Algorithm

Plaintext : “**hello bop**”

**Key :**           **5    2    1    4    3**

**Plaintext :**    **h    e    l    l    o**

**b    o    p    y    z**

The Cipher text is “**LPEOOZLYHB**”

## 2. Decryption Algorithm

The Cipher text is “**LPEOOZLYHB**”

<b>Key :</b>	<b>5</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>3</b>
<b>Cipher text :</b>	<b>H</b>	<b>E</b>	<b>L</b>	<b>L</b>	<b>O</b>
	<b>B</b>	<b>O</b>	<b>P</b>	<b>Y</b>	<b>Z</b>

The Plaintext is “**hello bop yz**”



The Plaintext is “**hello bop**”

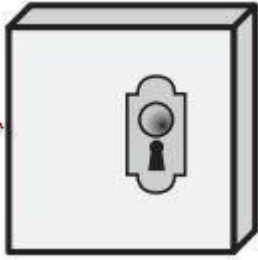
**Key is 52143**

**Key is 52143**



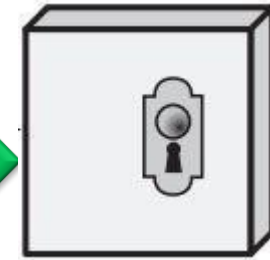
**hello bop**

**(Sender)**



Encryption algorithm  
By using **Row by Column** Cipher

**LPEOOZLYHB**



Decryption algorithm  
By using **Row by Column** Cipher

**hello bop**

**(receiver)**

## Example 2

Encrypt and decrypt the message “**hello bop**” by using **Row** by **Column** Technique with the **Key ALI**.

Ans:-

### 1. Encryption Algorithm

Plaintext : “**hello bop**”

a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Key :           A       L       I

                  1       3       2

Plaintext :     h       e       l

                  l       o       b

                  o       p       z

The Cipher text is “**HLOLBZEOP**”

## 2. Decryption Algorithm

The Cipher text is “**HLOLBZEOP**”

**Key :**            **A**      **L**      **I**

**1**      **3**      **2**

**Cipher text :** **H**      **E**      **L**

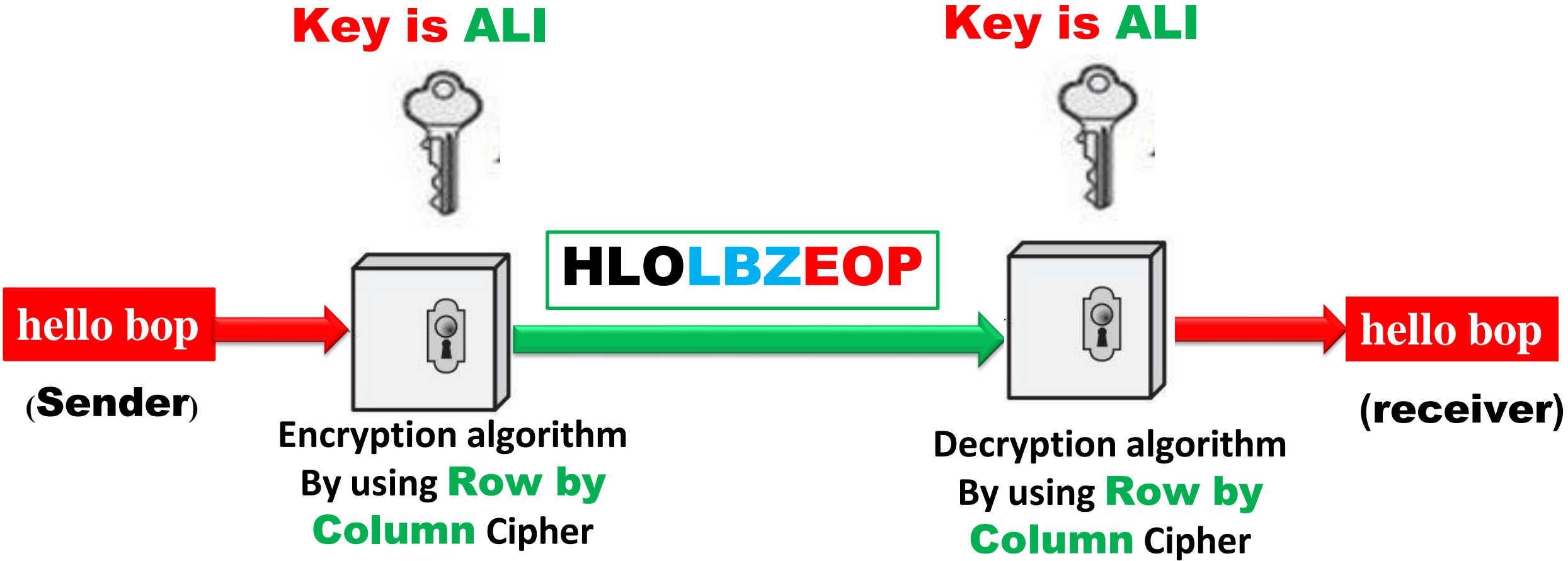
**L**      **O**      **B**

**O**      **P**      **Z**

The Plaintext is “**hello bop z**”



The Plaintext is “**hello bop**”



# Homework

Encrypt and decrypt the message “**attack postponed till nine afternoon**” by using **Row by Column** with the key **4312567**.