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## **A NEW APPROACH FOR ENCRYPTING AND DECRYPTING PHONE NUMBERS**

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Received on 04-11-2015

Accepted on 20-12-2015

### **Abstract**

Nowadays cryptography plays a major role in information security because encryption and decryption is very hard to crack. Data encryption and decryption fulfill these demands. Many researchers have proposed many encryption and decryption algorithms such as AES, DES, RSA, and others. But most of the proposed algorithms encountered some problems such as lack of robustness and significant amount of time added to packet delay to maintain the security on the communication channel between the terminals. In this paper, we enhance the security goals via encrypting and decrypting phone numbers by using a set of packs which maintains the security on the communication channels. In encryption we assign numbers for the set of packs and we convert the decimal to hexadecimal to encrypt the data and to decrypt vice versa.

**Keywords:** Encryption, Decryption, Pack of Cards, Phone number, Decimal and Hexadecimal.

### **Introduction**

Cryptography is the practice and study of techniques for secure communication. Encryption is the most effective way to achieve data security. This process achieves an effective role in hiding the contents of the message, because the original information can only be recovered through the description process. In 1999 Zimmerman [1] described the detailed concepts of cryptography. The main motto of encryption is to hide the information from third parties for viewing [2]. Encryption occurs when the data is passed through some substitute technique, shifting technique, table references or mathematical operations [3]. The process generates a different form of code. The unencrypted data is referred to as the plaintext and the encrypted data as the cipher text. The major issue to design any encryption and decryption methodology

is to improve the security level [4]. Also in [5], the authors discussed cryptography using pair of dice. In this paper, we propose a methodology to improve the security level. This paper is structured as follows, encrypting and decrypting phone numbers using set of packs [6].The methodology includes the following process:

### **Proposed Method**

1. In this proposed method, we will use a set of packs which are diamond shaped and the number of cards are thirteen.
2. By using these cards we will assign the numbers of the packs to a particular number in order to encrypt and decrypt the data.
3. The original number was decrypted using the assigned pack of cards and the message is transmitted.
4. In this process, we will use the technique to convert the decimal number to the hexadecimal number to encrypt the data.
5. After receiving the message the receiver will decrypt the data according to the key, as already set by the pack of cards and this makes the message to transfer securely.

Encryption can be done by using the proposed scheme by converting decimal number to hexadecimal number

1. Start by writing a column of numbers. On the first row, write down the decimal number you wish to convert.
2. In the next row, write the value above it divided by 2. Write only the integer portion of the number, ignoring any fractional part. Repeat this step until the value written is 1.
3. Start a second column of number, to the right of the first. In this column, write a 1 if the number beside it is odd or a zero if the number beside it is even. Write down a column of 1's and 0's corresponding to each number in the first column.
4. Starting from the bottom of the second column and working upward, write down the 1's and 0's, from left to right. The bottom digit (1 or 0) is written first. Then the second from bottom is written, and so on for each binary digit. The resulting digits are binary. We will convert those binary into hexadecimal.

### **Standard format of hexadecimal numbers:**

0→0000, 1→0001, 2→0010, 3→0011, 4→0100, 5→0101, 6→0110, 7→0111, 8→1000, 9→1001, A→1010, B→1011, C→1100, D→1101, E→1110, F→1111

Example to convert decimal into binary:

Divide the number 369 by 2 and write the remainders

369 → 0001 0111 0001

**Notations of the set of packs**

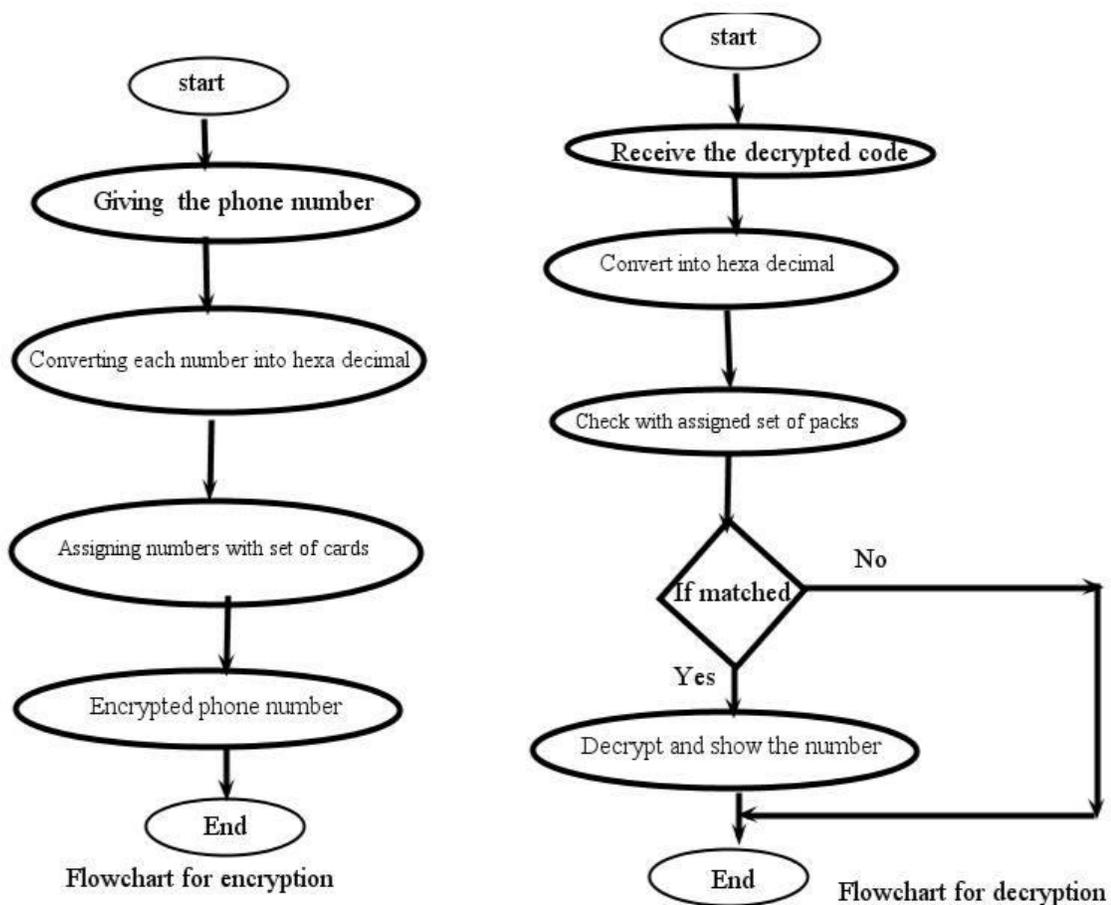
In a pack of cards, total number of cards are 52 in those we will select a set of packs which includes 13 cards and they are A,2,3,4,5,6,7,8,9,10,J,Q,K and we will assign the numbers.

J → 0, A → 1, 2 → 9, 3 → 8, 4 → 7, 5 → 6, 6 → 5, 7 → 4, 8 → 3, 9 → 2, Q → \*, K → #, 10 → +;

In this manner we will decrypt the data and we will convert these numbers into binary and assign the values of the set of packs.

**Proposed Encryption Scheme:**

Here we have proposed a method of encryption of any message using a set of packs. We use the pack of cards to decrypt the any type of numbers and we are employing this since the decryption of the code will be very lengthy as it will be very cumbersome to decode a lengthy binary string. The flowchart of the proposed method is given below.



Below the list of the joint outcomes given accordingly,

**J-0000→0, A-0001→1, 2-0010→9, 3-0011→8, 4-0100→7, 5-0101→6, 6-0110→5, 7-0111→4, 8-1000→3, 9-1001→2, Q-1010→\*, K-1011→#, 10-1100→+**

Using this technique we will encrypt the data by the set of pack of 13 cards by using decimal to hexadecimal and we can transfer easily and securely.

### **Example**

Let us consider the example for encryption

9941874006

1001 1001 0100 0001 1000 0111 0100 0000 0000 0110

The encrypted code will be

227A347JJ5

The above example gives us the encrypted code for the given phone number. Now we will give another example for decryption of the encoded code.

### **Example**

Let us decrypt the code

3A734922J4

0011 0001 0111 0011 0100 1001 0010 0010 0000 0100

Now we are converting the given binary digit into phone number

8148729907

The given encrypted code can be decrypted in the above mentioned method.

### **Conclusion**

In this paper, we described the encryption method for a given phone number by converting each number into hexadecimal and assigning that number with the pack of 13 cards and we compared the outcomes with the respective digits. We have encrypted the data and the receiver will decrypt the message by converting digits into hexadecimal codes and compared with the assigned set of pack of 13 cards. In this way we can transfer our data more securely and safely.

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