- **Program Code:**

```java
import java.util.*;
public class simpleColumnar{

public static void main(String sap[]){

Scanner sc = new Scanner(System.in);
System.out.println("BCOB131 Pratik Bangal");
System.out.println("\nEnter plaintext(enter in lower case): ");
String message = sc.next();
System.out.print("\nEnter key in numbers: ");
String key = sc.next();

int columnCount = key.length();

int rowCount = (message.length()+columnCount)/columnCount;

int plainText[][] = new int[rowCount][columnCount];
int cipherText[][] = new int[rowCount][columnCount];

System.out.print("\n-----Encryption-----\n");
cipherText = encrypt(plainText, cipherText, message, rowCount, columnCount, key);

String ct = "";
for(int i=0; i<columnCount; i++)
{
for(int j=0; j<rowCount; j++)
{
if(cipherText[j][i] == 0)
ct = ct + 'x';
```

```java
        else{
        ct = ct + (char)cipherText[j][i];
        }
        }
        }
        System.out.print("\nCipher Text: " + ct);


        System.out.print("\n\n\n-----Decryption-----\n");
        plainText = decrypt(plainText, cipherText, ct, rowCount, columnCount, key);


        String pt = "";
        for(int i=0; i<rowCount; i++)
        {
        for(int j=0; j<columnCount; j++)
        {
        if(plainText[i][j] == 0)
        pt = pt + "";
        else{
        pt = pt + (char)plainText[i][j];
        }
        }
        }
        System.out.print("\nPlain Text: " + pt);
        System.out.println();
        }
        static int[][] encrypt(int plainText[][], int cipherText[][], String message, int rowCount,
        int columnCount, String key){
        int i,j;
        int k=0;
```

```
for(i=0; i<rowCount; i++)

{

for(j=0; j<columnCount; j++)

{


if(k < message.length())

{


plainText[i][j] = (int)message.charAt(k);

k++;

}

else

{

break;

}

}

}


for(i=0; i<columnCount; i++)

{


int currentCol= ( (int)key.charAt(i) - 48 ) -1;

for(j=0; j<rowCount; j++)

{

cipherText[j][i] = plainText[j][currentCol];

}

}

System.out.print("Cipher Array(read column by column): \n");

for(i=0;i<rowCount;i++){

for(j=0;j<columnCount;j++){
```

```java
System.out.print((char)cipherText[i][j]+"\t");

}

System.out.println();

}

return cipherText;

}

static int[][] decrypt(int plainText[][], int cipherText[][], String message, int rowCount,

int columnCount, String key){

int i,j;

int k=0;

for(i=0; i<columnCount; i++)

{

int currentCol= ( (int)key.charAt(i) - 48 ) -1;

for(j=0; j<rowCount; j++)

{

plainText[j][currentCol] = cipherText[j][i];

}

}

System.out.print("Plain Array(read row by row): \n");

for(i=0;i<rowCount;i++){

for(j=0;j<columnCount;j++){

System.out.print((char)plainText[i][j]+"\t");

}

System.out.println();

}

return plainText;

}

}
```

- **Output:**

```
Output                                                    Clear

java -cp /tmp/5MDWywq860 simpleColumnar
BCOB131 Pratik Bangal
Enter plaintext(enter in lower case):
networksecurity
Enter key in numbers: 31452
-----Encryption-----
Cipher Array(read column by column):
t   n   w   o   e
s   r   e   c   k
i   u   t   y   r
..........
Cipher Text: tsixnruxwetxocyxekrx


-----Decryption-----
Plain Array(read row by row):
n   e   t   w   o
r   k   s   e   c
u   r   i   t   y
..........
Plain Text: networksecurity
```