Decryption Pseudocode

Decryption(cipherText, key, round){

Checking if round count is over, if so, return the decrypted plaintext. If not just keep decrypting one more round.

Create array[i=key] [j=ciphertext length]. And fill each space with null.

Create direction_down boolean value because the railway direction turns back each time it reaches the sides.

Create row and column index both to 0.

r=0, c=0

For each column, we mark '*' as the position that the encryption method went through while checking the correct direction.

If r=0 or r=key-1, direction_down=!direction_down

arr[r][c++]='*'

So the arracy will be like this:

*				*				*
	*		*		*		*	
		*				*		

index=0

For each row, we check each column incrementally. And insert the ciphertext one by one if the array space contains '*'. No need to check direction this time because we are checking

```
for(i=0,i<depth,i++)
        for(j=0,j<ciphterText.length(),j++)
                if(array[i][j]=='*')
                        Insert one space from cipher text
```

Create empty buffer plainText and rest row, column to 0 in order to move the pointer back to array[0][0]. And then do the same method as we encrypt a plaintext(going from left top to right bottom and push each value back to the buffer). When the column reaches ciphertext length, then that's the end and the decrypted text is stored in the PlainText buffer.

```
plainText="", r=0, c=0
for(i<length,i++)
        if(r==0){direction_down=true}
        if(r==key-1){direction_down=false}
        if(arr[r][c]!='*')
                plainText=array[r][c++]
        if(dir_down){r++}else{r--}
```

Finally decrease round turn by one and go through the function again.}

Example

Assume we have encrypted text of 123456789(plainText) by key 3 which is 159246837(CipherText). We firstly create the array by its length and key size and insert the '*':

*				*				*
	*		*		*		*	
		*				*		

Secondly we insert the cipher text into the array row by row(filling each row first), we got:

1				5				9
	2		4		6		8	
		3				7		

Thirdly, we read through each column while row number is increasing(while down) or decreasing(while up). For example, 1 to 3 to 5 to 7 to 9. The plainText finally can be obtained(123456789).

Above are our pseudocode and explanation of the decryption algorithm.