

HILL CIPHER

```
// Java code to implement Hill Cipher
class GFG
{
    // Following function generates the
    // key matrix for the key string
    static void getKeyMatrix(String key, int keyMatrix[][])
    {
        int k = 0;
        for (int i = 0; i < 3; i++)
        {
            for (int j = 0; j < 3; j++)
            {
                keyMatrix[i][j] = (key.charAt(k)) % 65;
                k++;
            }
        }
    }

    // Following function encrypts the message
    static void encrypt(int cipherMatrix[],
                        int keyMatrix[],
                        int messageVector[][])
    {
        int x, i, j;
        for (i = 0; i < 3; i++)
        {
            for (j = 0; j < 1; j++)
            {
                cipherMatrix[i][j] = 0;

                for (x = 0; x < 3; x++)
                {
                    cipherMatrix[i][j] += keyMatrix[i][x] * messageVector[x][j];
                }

                cipherMatrix[i][j] = cipherMatrix[i][j] % 26;
            }
        }
    }
}
```

```

// Function to implement Hill Cipher
static void HillCipher(String message, String key)
{
    // Get key matrix from the key string
    int [][]keyMatrix = new int[3][3];
    getKeyMatrix(key, keyMatrix);

    int [][]messageVector = new int[3][1];

    // Generate vector for the message
    for (int i = 0; i < 3; i++)
        messageVector[i][0] = (message.charAt(i)) % 65;

    int [][]cipherMatrix = new int[3][1];

    // Following function generates
    // the encrypted vector
    encrypt(cipherMatrix, keyMatrix, messageVector);

    String CipherText="";

    // Generate the encrypted text from
    // the encrypted vector
    for (int i = 0; i < 3; i++)
        CipherText += (char)(cipherMatrix[i][0] + 65);

    // Finally print the ciphertext
    System.out.print(" Ciphertext:" + CipherText);
}

// Driver code
public static void main(String[] args)
{
    // Get the message to be encrypted
    String message = "ACT";

    // Get the key
    String key = "GYBNQKURP";

    HillCipher(message, key);
}

```

Output

```
C:\>cd C:\jdk-20.0.2
C:\jdk-20.0.2>cd bin
C:\jdk-20.0.2\bin>javac GFG.java
C:\jdk-20.0.2\bin>java GFG
  Ciphertext:POH
C:\jdk-20.0.2\bin>|
```