**Q.No.14 Write a high level code for PT-109 American patrol boat, under the command of Lieutenant Jodhn F.**

**Kennedy, was sunk by a Japanese destroyer, a message was received at an Australian wireless station in**

**Playfair code:**

**KXJEY UREBE ZWEHE WRYTU HEYFS**

**KREHE GOYFI WTTTU OLKSY CAJPO**

**BOTEI ZONTX BYBNT GONEY CUZWR**

**GDSON SXBOU YWRHE BAAHY USEDQ**

**CODE :**

**public class PlayfairCipherDecoder {**

**public static void main(String[] args) {**

**String ciphertext = "KXJEY UREBE ZWEHE WRYTU HEYFS\n" +**

**"KREHE GOYFI WTTTU OLKSY CAJPO\n" +**

**"BOTEI ZONTX BYBNT GONEY CUZWR\n" +**

**"GDSON SXBOU YWRHE BAAHY USEDQ";**

**// Remove all whitespace and convert to uppercase**

**String plaintext = ciphertext.replaceAll("\\s+", "").toUpperCase();**

**// Generate the Playfair matrix**

**char[][] matrix = generateMatrix("JOHNFKENNEDY");**

**// Decode the ciphertext using the Playfair algorithm**

**StringBuilder sb = new StringBuilder();**

**for (int i = 0; i < plaintext.length(); i += 2) {**

**char c1 = plaintext.charAt(i);**

**char c2 = plaintext.charAt(i + 1);**

**int[] pos1 = findPosition(matrix, c1);**

**int[] pos2 = findPosition(matrix, c2);**

**if (pos1[0] == pos2[0]) { // same row**

**sb.append(matrix[pos1[0]][(pos1[1] + 4) % 5]);**

**sb.append(matrix[pos2[0]][(pos2[1] + 4) % 5]);**

**} else if (pos1[1] == pos2[1]) { // same column**

**sb.append(matrix[(pos1[0] + 4) % 5][pos1[1]]);**

**sb.append(matrix[(pos2[0] + 4) % 5][pos2[1]]);**

**} else { // different row and column**

**sb.append(matrix[pos1[0]][pos2[1]]);**

**sb.append(matrix[pos2[0]][pos1[1]]);**

**}**

**}**

**// Print the decoded message**

**System.out.println(sb.toString());**

**}**

**// Generate the Playfair matrix from the keyword**

**public static char[][] generateMatrix(String keyword) {**

**String key = keyword.toUpperCase().replaceAll("[^A-Z]", "");**

**key = key + "ABCDEFGHIKLMNOPQRSTUVWXYZ";**

**char[] keyArray = key.toCharArray();**

**char[][] matrix = new char[5][5];**

**int index = 0;**

**for (int i = 0; i < 5; i++) {**

**for (int j = 0; j < 5; j++) {**

**matrix[i][j] = keyArray[index];**

**index++;**

**}**

**}**

**return matrix;**

**}**

**// Find the position of a character in the Playfair matrix**

**public static int[] findPosition(char[][] matrix, char c) {**

**int[] pos = new int[2];**

**for (int i = 0; i < 5; i++) {**

**for (int j = 0; j < 5; j++) {**

**if (matrix[i][j] == c) {**

**pos[0] = i;**

**pos[1] = j;**

**break;**

**}**

**}**

**}**

**return pos;**

**}**

**}**

**OUTPUT :**

