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**Class: BECSEII**

**Aim: WRITE A JAVA PROGRAM TO IMPLEMENT TRANSPOSITION CIPHER**

**ROLL: 63**

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**import java.util.\*;**

**class TranspositionCipher {**

**Scanner sc = new Scanner(System.in);**

**char alphabets[] = new char[26];**

**String input = new String();**

**int no\_of\_digits\_in\_key;**

**int key[] = new int[20];**

**String ciphertext = new String();**

**String plaintext = new String();**

**int cols,rows;**

**char table[][];**

**char table2[][];**

**TranspositionCipher(){**

**int i;**

**char j;**

**for(i=0,j='A';i<26;i++,j++){**

**alphabets[i] = j;**

**}**

**}**

**int max(int a[],int len){**

**int m = a[0];**

**for(int i=1;i<len;i++){**

**if(m<a[i]){**

**m = a[i];**

**}**

**else{**

**continue;**

**}**

**}**

**return m;**

**}**

**void getInputs(){**

**int cnt=0;**

**System.out.println("\nEnter the Input String To Be Encrypted");**

**input = sc.nextLine();**

**input = input.toUpperCase();**

**input.trim();**

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

**if(input.charAt(i) == 32){**

**break;**

**}**

**cnt+=1;**

**}**

**}**

**void getKey(){**

**System.out.println("\nEnter the Space Separated Key");**

**String st;**

**String tmp[];**

**st = sc.nextLine();**

**tmp = st.split(" ");**

**no\_of\_digits\_in\_key = tmp.length;**

**for(int i=0;i<no\_of\_digits\_in\_key;i++){**

**key[i] = Integer.parseInt(tmp[i]);**

**}**

**cols = max(key,no\_of\_digits\_in\_key);**

**int temp;**

**temp = input.length()%cols;**

**if(temp == 0){**

**rows = input.length() / cols;**

**}**

**else{**

**rows = input.length()/cols +1;**

**}**

**table = new char[rows][cols];**

**table2 = new char[rows][cols];**

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

**}**

**void cipher(){**

**int k=0;**

**System.out.println("\nCipher Matrix: ");**

**for(int i=1;i<=no\_of\_digits\_in\_key;i++){**

**System.out.print(i +" ");**

**}**

**System.out.println("");**

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

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

**if(k < input.length()){**

**table[i][j] = input.charAt(k);**

**k+=1;**

**}**

**}**

**}**

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

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

**System.out.print(table[i][j] +" ");**

**}**

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

**}**

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

**int i=key[0];**

**int ctr=0;**

**// i refer to columns**

**// j refer to rows**

**for(;ctr<no\_of\_digits\_in\_key;){**

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

**ciphertext+=table[j][i-1];**

**}**

**i = key[++ctr];**

**}**

**ciphertext = ciphertext.replaceAll("\0", "");**

**System.out.println(input +" is Encrypted To " +ciphertext);**

**}**

**void decrypt(){**

**int k=0;**

**System.out.println("\nPlain Matrix: ");**

**for(int i=1;i<=no\_of\_digits\_in\_key;i++){**

**System.out.print(i +" ");**

**}**

**System.out.println("");**

**int i = key[0];**

**int ctr=0;**

**for(;ctr<no\_of\_digits\_in\_key;){**

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

**if(k<input.length()){**

**table2[j][i-1]= ciphertext.charAt(k);**

**k+=1;**

**}**

**}**

**i = key[++ctr];**

**}**

**for(i=0;i<rows;i++){**

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

**System.out.print(table2[i][j] +" ");**

**}**

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

**}**

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

**for(i=0;i<rows;i++){**

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

**plaintext+=table2[i][j];**

**}**

**}**

**System.out.println(ciphertext +" is Decyrted To " +plaintext);**

**}**

**}**

**class TranspositionCipherFurkhan {**

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

**TranspositionCipher tc = new TranspositionCipher();**

**tc.getInputs();**

**tc.getKey();**

**tc.cipher();**

**tc.decrypt();**

**}**

**}**

**// OUTPUT**

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**Enter the Input String To Be Encrypted**

**FURKHAN SHAIKH**

**Enter the Space Separated Key**

**4 3 2 1 5**

**Cipher Matrix:**

**1 2 3 4 5**

**F U R K H**

**A N S H**

**A I K H**

**FURKHAN SHAIKH is Encrypted To KSHR KUNIFAAHH**

**Plain Matrix:**

**1 2 3 4 5**

**F U R K H**

**A N S H**

**A I K H**

**KSHR KUNIFAAHH is Decyrted To FURKHAN SHAIKH**

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