1. **Available Captures for Rook**
2. String[][] mat = {{".",".",".",".",".",".",".","."},  
    {".","p","p","p","p","p",".","."},  
    {".","p","p","B","p","p",".","."},  
    {".","p",".","R",".","p",".","."},  
    {".","p","p","B","p","p",".","."},  
    {".","p","p","p","p","p",".","."},  
    {".",".",".",".",".",".",".","."},  
    {".",".",".",".",".",".",".","."}};  
   *int* x=0,y=0,count=0;  
   *//find rook position  
   for*(*int* i=0;i< mat.length;i++){  
    *for*(*int* j=0;j<mat[0].length;j++){  
    *if*(mat[i][j]=="R"){  
    x=j;  
    y=i;  
    *break*;  
    }  
    }  
    *if*(x!=0){  
    *break*;  
    }  
   }  
     
   *//now check in all four direction of rook  
   //Right side check  
   for* (*int* i=x;i<mat[0].length;i++){  
    *if*(mat[y][i]=="B"){  
    *break*;  
    }  
    *if*(mat[y][i]=="p"){  
    count++;  
    }  
   }  
   *//Left side check  
   for* (*int* i=x;i>=0;i--){  
    *if*(mat[y][i]=="B"){  
    *break*;  
    }  
    *if*(mat[y][i]=="p"){  
    count++;  
    }  
   }  
   *//Up side check  
   for* (*int* i=y;i>=0;i--){  
    *if*(mat[i][x]=="B"){  
    *break*;  
    }  
    *if*(mat[i][x]=="p"){  
    count++;  
    }  
   }  
   *//Below side check  
   for* (*int* i=y;i<mat.length;i++){  
    *if*(mat[i][x]=="B"){  
    *break*;  
    }  
    *if*(mat[i][x]=="p"){  
    count++;  
    }  
   }  
     
   System.***out***.println(count);

**2.Toeplitz Matrix**

*// int[][] mat ={{1,2,3,4},{5,1,2,3},{9,5,1,2}};  
 int*[][] mat ={{1,2},{2,2}};  
 *int* cross\_x,cross\_y,ans=0;  
  
 *// first travelling in down the matrix and checking condition  
 for*(*int* i=0;i< mat.length;i++){  
 cross\_y=i;  
 cross\_x=0;  
 *for* (*int* j=0;cross\_y< mat.length;j++){  
 *if*(mat[cross\_y][cross\_x]!=mat[i][0]){  
 ans=1;  
 *break*;  
 }  
 cross\_x+=1;  
 cross\_y+=1;  
 }  
 *if*(ans!=0){  
 *break*;  
 }  
 }  
  
 *if*(ans!=0){  
 System.***out***.println("false");  
 }*else* {  
 *// Now if in row traversal all is okay then moving to column traversal* cross\_x=0;  
 cross\_y=0;  
 *for*(*int* i=1;i<mat[0].length;i++){  
 cross\_x=i;  
 cross\_y=0;  
 *for*(*int* j=i;cross\_x< mat[0].length;j++){  
 *if*(mat[cross\_y][cross\_x]!=mat[0][i]){  
 ans=1;  
 *break*;  
 }  
 cross\_x+=1;  
 cross\_y+=1;  
 }  
 *if*(ans!=0){  
 *break*;  
 }  
 }  
 *if*(ans==0){  
 System.***out***.println("true");  
 }*else* {  
 System.***out***.println("false");  
 }  
 }

1. **Special Positions in a Binary Matrix**
2. *// int[][] mat ={{1,0,0},{0,0,1},{1,0,0}};  
    int*[][] mat ={{1,0,0},{0,1,0},{0,0,1}};  
    HashMap<Integer,Integer> hmap= *new* HashMap<>();  
     
    *//putting all 1 elements position in hmap  
    for*(*int* i=0;i<mat.length;i++){  
    *for*(*int* j=0;j<mat[0].length;j++){  
    *if*(mat[i][j]==1){  
    hmap.put(i,j);  
    }  
    }  
    }  
     
    *// Checking (x,y) to other position  
    int* x,y,check,count=0;  
      
    *for* (*int* s: hmap.keySet()) {  
    x=s;  
    y=hmap.get(s);  
    check=0;  
    *for* (*int* ele: hmap.keySet()) {  
    *if*(s==ele && hmap.get(s)==hmap.get(ele)){  
    *continue*;  
    }  
    *if*(x==ele){  
    check=1;  
    *break*;  
    }  
    *if*(y==hmap.get(ele)){  
    check=1;  
    *break*;  
    }  
    }  
     
    *if*(check==0){  
    count++;  
    }  
    }  
     
    System.***out***.println(count);
3. **Jewels and Stones**
4. *int* count=0;  
   String jewels="aA";  
   *char*[] jewels\_arr = jewels.toCharArray();  
   String stones="aAAbbbb";  
   *char*[] stones\_arr = stones.toCharArray();  
   HashMap<Integer, Character> hmap = *new* HashMap<>();  
     
   *for*(*int* i=0;i<jewels\_arr.length;i++){  
    hmap.put(i,jewels\_arr[i]);  
   }  
     
   *for*(*int* i=0;i< stones\_arr.length;i++){  
    *if*(hmap.containsValue(stones\_arr[i])){  
    count++;  
    }  
   }  
     
   System.***out***.println(count);

**5 .  Sorting the Sentence**

String s= "is2 sentence4 This1 a3";  
*char*[] s\_arr = s.toCharArray();  
System.***out***.println(s\_arr);  
ArrayList<Character> arr = *new* ArrayList<>();  
*char* key;  
String str="";  
HashMap<Character,String> hmap = *new* HashMap<>();  
*for*(*int* i=0;i< s\_arr.length;i++){  
  
 *if*(s\_arr[i]==' '|| i==s\_arr.length-1){  
 System.***out***.println(arr);  
 *for*(*int* j=0;j<arr.size()-1;j++){  
 str+=arr.get(j);  
 }  
  
 key= arr.get(arr.size()-1);  
 *if*(i== s\_arr.length-1){  
 key= s\_arr[i];  
 *for*(*int* j=0;j< arr.size();j++){  
 str+=arr.get(j);  
 }  
 }  
 hmap.put(key,str);  
 str="";  
 arr.clear();  
  
 }*else* {  
 arr.add(s\_arr[i]) ;  
  
 }  
}  
System.***out***.println(hmap);  
*char* k;  
*for*(*int* i=1;i<= hmap.size();i++){  
 k= (*char*) (i+48);  
 System.***out***.print(hmap.get(k)+" ");  
}

1. **to lowercase**
2. String str = "Hello";  
    System.***out***.println(str.toLowerCase());

**7.Determine if String Halves Are Alike**

*// String str ="textbook";* String str ="book";  
 *char*[] str\_arr= str.toCharArray();  
 *char*[] str1 = *new char*[ str.length()/2];  
 *char*[] str2 = *new char*[ str.length()/2];  
  
 *for* (*int* i=0;i<str.length()/2;i++){  
 str1[i]= str\_arr[i];  
 }  
 *for* (*int* i=0;i<str.length()/2;i++){  
 str2[i]= str\_arr[str\_arr.length/2+i];  
 }  
  
 *int* count\_1=0;  
 *for*(*int* i=0;i< str1.length;i++){  
 *if*(str1[i]=='a'||str1[i]=='e'||str1[i]=='i'||str1[i]=='o'||str1[i]=='u'){  
 count\_1++;  
 }  
 }  
 *int* count\_2=0;  
 *for*(*int* i=0;i< str2.length;i++){  
 *if*(str2[i]=='a'||str2[i]=='e'||str2[i]=='i'||str2[i]=='o'||str2[i]=='u'){  
 count\_2++;  
 }  
 }  
  
 *if*(count\_1==count\_2){  
 System.***out***.println("true");  
 }*else* {  
 System.***out***.println("false");  
 }

1. **Reverse a string**
2. String str = "123abcdefghijkmno456";  
    *char*[] str\_arr= str.toCharArray();  
     
   *// char temp;  
     
     
   // for(int i=0;i<= str.length()/2;i++){  
   // temp=str\_arr[i];  
   // str\_arr[i]=str\_arr[str\_arr.length-1-i];  
   // str\_arr[str\_arr.length-1-i]=temp;  
   // }* String str1="";  
    *for*(*int* i=str\_arr.length-1;i>=0;i--){  
    str1+=str\_arr[i];  
    }  
     
    System.***out***.println(str1);